Risk Management in Investment Operations: Strategic and Policy Issues
BY
SIDIQUE A B SESAY
DIRECTOR, INTERNATIONAL FINANCE DEPT
BANK OF SIERRA LEONE
26TH APRIL 2007
This presentation is divided into 3 sections:

- **Section I** Global growth in external reserves
- **Section II** Broad overview of investment management
- **Section III** Risk management in investment operations
- **Section IV** Implementing risk management policies and procedures
- **Conclusion**
Overview: Global Growth

External Reserves
Economic growth in Africa has great potential

Recent years have witnessed the strengthening of economies of sub-Saharan African countries, with a large number of countries now experiencing average GDP growth rates above 5%.

Annual GDP growth rates (Year end 2006)
## Annual GDP growth rates for selected African Countries (Year end 2006)

<table>
<thead>
<tr>
<th>Country</th>
<th>Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghana</td>
<td>6.6</td>
</tr>
<tr>
<td>Nigeria</td>
<td>5.2</td>
</tr>
<tr>
<td>Zambia</td>
<td>6</td>
</tr>
<tr>
<td>Uganda</td>
<td>5.5</td>
</tr>
<tr>
<td>Tanzania</td>
<td>5.9</td>
</tr>
<tr>
<td>Kenya</td>
<td>5.4</td>
</tr>
<tr>
<td>Mozambique</td>
<td>7.9</td>
</tr>
<tr>
<td>Malawi</td>
<td>8.4</td>
</tr>
<tr>
<td>Rwanda</td>
<td>5.5</td>
</tr>
<tr>
<td><em>Sierra Leone</em></td>
<td>7.3</td>
</tr>
</tbody>
</table>

* Figure is at end 2005
With many countries benefiting from improved economic conditions

Structural, financial and institutional reforms are paying off 20
African nations are already eligible for debt cancellation from these initiatives

Another 20 to follow in the near future.

Positive consequence of freeing resources to allocate to government budget
Commodity windfalls have been supportive.

Strength in commodity prices in recent years has buoyed the growth trail of many sub-Saharan African countries.

CRB all commodity future price index

Crude oil price evolution
Contributing to improvements in foreign exchange reserve conditions

- Global official reserves have more than doubled in the past 4 years, with Asian economies and oil-exporting nations being predominant drivers.

- International reserves of African countries have been rising.

- Governments are increasingly aware of the importance of efficiently managing these funds, if these economic gains are to be sustained and improved upon.
Percentage increase in latest foreign reserves over 2-year period

- Morocco: 22%
- Ghana: 21%
- Nigeria: 150%
- Zambia: 120%
- Namibia: 56%
- Uganda: 24%
- Kenya: 61%
- Botswana: 31%
Reserves are held for a variety of reasons:

- Tool for Monetary Policy
- Pay for Government Foreign Goods Purchases
- Meet Foreign Debt Obligations and Ultimately Repay
- A source of income
- Particularly in fixed ER regimes
- To meet future financial requirements
- Instills confidence amongst creditors
- Investing the reserves can generate returns
There is a heightened importance on managing reserve funds effectively.

Investment/Asset management entails:

Managing a portfolio of assets, through decisions on sales and purchases, in order to achieve certain investment goals that normally organization specific.

- STOCKS
- BONDS
- DERIVATIVES
- COMMODITIES
- REAL ESTATE
with a dominant objective of preserving capital

Objectives of Investment Management

- Preserve Capital
- Liquidity Management
- Key for Reserve management

- Earn reasonable returns
- Meet payments on liabilities (i.e. Loan repayments, Insurance, premiums)
- Manage foreign exchange risk
Reserve management policies are usually conservative

Policies and guidelines usually focus on:

• Currencies and in what proportions to be held as reserve assets.

• Suitable benchmarks to use, for the purpose of investing reserve funds, with limits to take positions on currencies or interest rates relative to these benchmarks.
Reserve management policies are usually conservative (Cont.)

- Eligible securities for investments, and their allocations
- Specified limits on the volumes of transactions done within a period
- The framework for managing and controlling investment risks like market, liquidity and credit risk.
Risk Management in Investment Operations

Risk can be defined in different ways:

- Potential for loss of capital (i.e. probability of a negative return)
- Volatility in earnings (unexpected return)
- Failure to meet expected (budget) return
  - Due to market conditions
  - Opportunity cost
- Loss due to operational or system failures
What is investment Risk Management?

- Risk management involves the assessment, control and management of the impact of past and future events that can adversely affect the investment performance or financial position of an institution's asset.

- Risk management plays a key role in overall investment policy.
Risk management has become very important

- Increasing financial globalisation, regulatory change and sophisticated financial markets have given rise to more complex products that require monitoring.
Risk management in investment operations

Objective and Scope

• Preserve reserve capital by minimizing the impact of adverse market conditions on the investment portfolio

• To effectively manage and measure market, credit and liquidity

• risk, all of which reserve portfolios are exposed to, while maintaining investment management objectives.
Operational Risk

• Operational risk is the potential exposure to unexpected financial and non-financial damage resulting from inadequate or failed internal processes, human factors and systems or external events.

• Financial Institutions in general define operational risk as the risk of loss arising from human technological error.
• Need to ensure necessary systems and processes are in place to avoid losses due to failure in operations

• Efficient trained staff, and up-to-date market systems for evaluating monitoring and reporting transactions should be in place.
Sources of Operational Risks

- People
- Systems
- Process
- External events

Fraud internal & external
Data entry errors
Key position risk
System failures

Improper documentation
Model risk
Business disruption

“A computer lets you make more mistakes faster than any human invention in history” - Mitch Ratcliffe
Relevant Risk Indicators

- Financial Risks
  - Operational Risks
  - Technology & Business Interruption Risk
  - MIS and Internal control systems
  - Regulatory compliance & Reporting Risk
  - Settlement & Execution Risk
  - Reputational & Fiduciary Risk

- Business Environment
  - Business strategy Risk
  - Macro Policy risks
  - Financial Infrastructure
    - Inherent systemic (Country) risk
    - Legal and regulatory Infrastructure

- Event Risks
  - Political risks
  - Contagion risk
  - Banking crisis risk
  - Other exogenous risks
Three Stages of Risk Management

1 Risk measurement
What is our risk?
How do we measure our risk.
Risk measure used depend on the complexity of portfolio management.

2 Risk Attribution.
Where does our risk come from?
Which decisions contribute to risk?

3 Risk Allocation
How do we utilize/manage risk going forward?
How do we want to allocate risk?
The AfDB has adopted a phased approach to the implementation of the framework

PHASE 1

The first phase is the identification and documentation of risk/controls around financial reporting to enhance reliability of such reports.

It will lead to the issuance of attestations on controls around financial reporting, that will be duly signed by senior management.
The second phase of implementation will be an extension of coverage into full operational risk management that will aim at enhancing transparency, effectiveness, and efficiency of operations, as well as compliance with rules and regulations.
LIQUIDITY RISK is a key concern in reserve management.

The potential for loss resulting from the inability to meet cash flow needs and obligations in a timely manner. This is a function of the institution's liability profile.

Comprises of:

**Liquidation risk**: risk of having to liquidate assets when market conditions may result in loss of realized value, in order to meet unexpected amounts of cash obligations.
LIQUIDITY RISK is a key concern in reserve management. LIQUIDITY RISK is a key concern in reserve management.

- **Capital Funding risk**: Risk of not being able to obtain sufficient external funding at the required time (i.e. meet unanticipated payment requirements), due to illiquid assets.

- Liquidity risk is also the potential for loss resulting from the inability to sell an investment or buy-back a short-position at a reasonable price within a reasonable period of time.
Measuring Liquidity Risk

- Measurement tools utilized must be kept current and monitored frequently against the institutions liquidity risk profile.

- To measure liquidity risk one would ideally require a liquidity gap measure capturing differences between outstanding balances of assets and liabilities overtime. A positive gap would be equivalent to deficit, which would be measured as a cash amount.

- Common tools utilized are cash flow modeling and liquidity ratios.
Measuring Liquidity Risk

- Cash flow modeling assesses the content of shortfalls and surpluses, and examines potential liquidity needs under a variety of stress testing scenarios, in order to determine a sufficient amount of cash and short-term liquid assets required to meet unexpected events.
Measuring Liquidity Risk (contd.)

- Liquidity ratios address liquidity needs by establishing a minimum normal expected amount of liquidity (i.e. liquidity limits) that would be required to meet the demands of liabilities to cover for unexpected liquidity requirements.

- Prudential Minimum Level (PML) of liquidity is a typical approach now used by Central Banks.

- The PML sets the minimum level of liquid assets that the Bank must maintain in the investment portfolio at all times. It is set quarterly at projected net cash requirements for a one-year rolling period.
Reserve entities management of liquidity risk

- For central banks and official international institutions like the AfDB, there is likely to be a division of the reserve portfolio into a “liquid” and “non-liquid” portfolio will have liquid securities, and more flexible guidelines that can address short-term or unanticipated liability requirements.

- Several Central Banks in Africa now adopt this method of separation:

  - ‘Operational portfolio’: managed to provide the most readily available source of liquidity to cover Bank’s short-term cash flow.
Reserve entities management of liquidity risk (Cont.)

- ‘Prudential portfolio’: has investments not immediately needed for operational requirements of the Bank.

- For BSL the approach is to more or less maintain a liquidity portfolio due to the low level of reserves the volatility of source
Liquidity management in the trading portfolio

• To manage the degree of liquidity in the portfolio, the marketability of assets needs to be monitored.

• At the AfDB, portfolio managers classify all investments at the time of purchase into one of two categories, “Very Liquid” and “Moderately Liquid”.

• Risk managers are responsible for reviewing the liquidity classification of the trading portfolio on a frequent basis.
<table>
<thead>
<tr>
<th>Liquidity Classification</th>
<th>Indicative Liquidation Period</th>
<th>Valuation Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Liquid</td>
<td>Within 3 business days</td>
<td>Daily quotes on Bloomberg Reuters</td>
</tr>
<tr>
<td>Moderately Liquid</td>
<td>Within 10 business days</td>
<td>Counterparty quotes at least once a month</td>
</tr>
</tbody>
</table>
MARKET RISK in Reserve Management Operations

- Market risk is the risk to the financial condition of institutions investments resulting from adverse movements in the level of market prices.

- Market risk reflects the sensitivity of income and balance sheet positions to changes in asset prices.

- Consists mainly of exchange rate risk and interest rate risk.

- Bank credit to the public sector can be an important source of market risk.
Exchange rate risk management is crucial.

- Risk of potential losses resulting from movements in currency exchange rates versus the numeraire currency.

- In a multi-currency portfolio, and to the extent that cash flows, assets and liabilities are denominated in different currencies, exchange rate changes can have an adverse impact on the value of an investment portfolio.

- Reserve assets are typically maintained in more than one currency making them susceptible to such unfavourable movements in exchange rates.
BSL manages exchange rate risk of its' assets

At present the Bank strives to achieve one principal currency risk management objective

• Protect the Bank’s risk capital from translation adjustments due to exchange rate movements i.e. Capital Preservation

• However once BSL becomes IAS compliant protecting the Bank from possible budget overruns due to exchange rate movement will become another major objective.
Interest rate risk is also a form of market risk

• Interest rate risk is the potential loss on the value of assets due to adverse movements in market interest rates.

• More relevant for institutions that need to explicitly match the flows of assets and liabilities.

• To the extent that future cashflows from assets and liabilities are insufficiently matched, movements in interest rates can have an adverse financial and economic impact.
Objectives of managing interest rate risk

• Protect financial performance from the risk of movements in interest rates that have adverse effect on assets.

• Measure the potential risk posed by interest rate changes on both the total portfolio and individual assets.

• Maintain alignment of interest rates close to that of the benchmarks used.
Market risks are typically measured using Value-at-Risk (VaR)

• The most popular method for measuring the risk of an investment portfolio is the Value-at-Risk (VaR).

• VaR measures the maximum potential financial loss in an investment portfolio.

• It provides an estimate of the worst expected loss over a certain period of time at a given confidence level.

• Used as it provides a common denominator for different kinds of risk and helps to better communicate this to senior management.
CREDIT RISK in reserve management

- Risk to reserve entity resulting from adverse situation in the credit quality of an issuer of securities, a country in which investments are made, or the counterparties/intermediaries, to whom the entity has exposure.

- Includes default risk, credit rating downgrades, credit/spread risk due to market perceptions and concentration risk, etc.

- Credit risk is typically the most important form of risk for commercial banks.
Assessing CREDIT RISK

An institution needs to consider 3 user:

- Default probabilities over the horizontal of the obligation
- Credit Exposure
- Recovery rate (What part of the exposure may be recovered bankruptcy)
Strategies employed to manage credit risk

- Assessing country risk as the situation of the countries in whose currency investments are denominated must be closely monitored.

- Establishing minimum acceptable credit quality and exposure limits on counterparties and issuers of securities i.e. Rating of commercial banks range from long-term A- to AA.
## Strategies employed to manage credit risk

### Example AfDB practice

<table>
<thead>
<tr>
<th>Type of counterparty</th>
<th>Minimum Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trading</td>
<td>A/A2</td>
</tr>
<tr>
<td>Derivative</td>
<td>AA.</td>
</tr>
</tbody>
</table>
Strategies employed to manage credit risk (contd.)

- Setting maturity limits on deposits per institution and per sector

- Setting maximum volume of investments in an issuer of securities to avoid concentration risk

- Using Credit Derivatives, whereby protection against default by an issuer can be bought or sold.

- Capturing all forms of credit risk arising from delivered positions settlement risk, pending transactions.
Some policies for mitigating counterparty credit risk

COLLATERAL SUPPORT AGREEMENT

• Reserve entities today are increasingly implementing collateral agreement frameworks to reduce credit risk, i.e. Collateral support Annex (CSA).

• This involves requesting for collateral support that will protect the interests of the reserve management entity in the event of a counterparty insolvency.
Some policies for mitigating counterparty credit risk (Cont.)

NETTING AGREEMENTS
• Netting agreements are also used in order to activate a close-out netting provision in the case of counterparty insolvency.

ISDA MASTER AGREEMENTS
• Due to increasingly complex instruments and use of derivative transactions, many reserve management entities insist, as a primary condition for derivative deals with its counterparties, the existence of an International Swaps and Derivatives Association (ISDA) Master Agreement.
Implementing Risk Management Policies and Procedures

Establishing a solid risk management policy is essential.

- **Increased awareness**: A key observation in today’s environment is that there is a significant awareness of the importance of risk management in reserve management operations.

- **Creation of a risk management framework**: There is a need to establish a risk management framework that identifies risk to reserve management operations and that allows the management of these risks within acceptable levels.
Implementing Risk Management Policies and Procedures (Cont.)

Establishing a solid risk management policy is essential

• **Need for adequate risk assessment:** Risk exposures should be monitored continuously, and there should be an overall effective monitoring of compliance with already determined investment management objectives and policies.
Prudent policies with clear guidelines should be adopted

- Must specify risk management objectives and scope

- Has to ensure clarity of roles, with well defined levels of responsibility, for full transparency and accountability.

- Should define processes to maintain an efficient operational framework for investment management activities.

- Should establish a clear risk management framework

- Same guidelines should be applied to externally managed funds.
and there should be clear-cut levels of responsibilities

• Internal governance structure should clearly reveal the roles and responsibilities of each level of decision making, from senior management to portfolio managers.

• Separate and distinct levels of authority should ensure transparency and accountability in risk management operations.

• Clear ownership of responsibility and an institution wide understanding of what has been delegated and to whom.
and segregation of duties in operations to enable accountability

- Analysis and implement optimal investment strategies and invest funds in line with investment policy framework
- Manage the portfolios against established benchmarks
- Interface with underwriters, banks and other market participants
and segregation of duties in operations to enable accountability (Cont.)

- Monitor front office activities by measuring and monitoring risk, and evaluating performance (i.e. against benchmark, and setting deviation from this benchmark)

- Implement risk control measures and ensure front office compliance to investment policies.
and segregation of duties in operations to enable accountability (Cont.)

BACK OFFICE
(Treasury Operations)

• Handle transaction confirmations, settlements, payments and disbursement payments.

• Maintain records of all investment transactions, settlements, etc.

• Implement security for payments instructions and settlements.
AfDB Finance Complex structure

VP Finance

- Treasury Dept
- Financial Management Dept
- Accounting & Fin. Control Dept.
- Internal Control Unit (ICU)

- ALM
  - Treasury Risk
  - Credit Risk Management

Policy Development
Compliance Monitoring
Financial Projections
ALCO Secretariat

*Compliance Monitoring
*Valuation
*Performance Reporting
*System Maintenance

*Country risk management
*Project risk rating
*Limit setting
*Compliance Monitoring
A good risk management framework addresses the following:

• Appropriate identification, measurement and evaluation of risks inherent in reserve management.

• Adequate control, monitoring and reporting procedures.

• Efficient people, processes & systems
The guidelines should specify procedures to manage currency risk

- Can match the currencies of assets and liabilities

- Using currency benchmarks with prescribed limits i.e. range of +/- 5 percent to 10 percent, and varying degrees per currency.

- Hedging of foreign currency risk should be paramount i.e. use of cross-currency swaps.

- Monitoring of historical long-term risk profile of currencies.

- Use of optimization models to determine the most efficient risk-return profiles.
and interest rate risk, liquidity risk and benchmark considerations

• Use of modified duration to ascertain an acceptable level of interest rate risk that can be absorbed.

• Use of Value-at-Risk (VaR) methodology to monitor, control and limit overall market risk on actively managed funds.

• Use of benchmark portfolio to manage and monitor risk exposure, serving as a reference for evaluating actual return earned on reserves.
and interest rate risk, liquidity risk and benchmark considerations (Cont.)

• Duration benchmarking by setting permissible deviation limits around the benchmark i.e. +/- 6 months for liquid portfolio or 10 year uniform repricing ladder.

• Portfolio tranches to reflect liquidity (liquid and passive / Hedd-to-Maturity).
The guidelines should also specify rules for the use of derivatives ....

- Currency and interest rate swaps
- Interest rate futures contracts
- Currency futures and forward contracts
- Credit derivatives
.... and ensure frequent reporting of portfolio performance

• Daily and monthly evaluation reports enable a constant assessment of performance.

• Performance and return attribution reports allow portfolio managers assess where risk lie, enabling a readjustment before positions become excessive, and identify the sources of return.

• Details relating to market risks, credit exposure positions (i.e. by sector, counterparty), information relevant to assessing current credit quality are also valuable.

• Ad hoc requests for reports on specific issues can also be requested from senior management to portfolio managers.
CONCLUSION

Risk management is an important aspect of investment operations

• To achieve its investment objectives, a Central Bank or any reserve management entity should ensure that sound risk management processes are in place and well-functioning.

• A well articulated Governance structure should be in place, consisting of Board of Directors, Senior Management.

• Board of Directors should determine Investment Policies.
CONCLUSION

• Globally banking and other investment has made important progress in dealing with the different and constantly changing risks faced by them.

• Risk management across region and countries have improved on account of concerted international effort to put in place risk mitigation frameworks that countries are obliged to follow.