Market Risk Review

June 2009

Prepared by the Financial Management Department
Market Risk Management Framework

Within the framework of strengthening institutional risk governance and oversight, the Risk Management department prepares each year a market risk review for Senior Management and the Board.

The purpose of such a review is to:

- Present and update the market risk management objectives and the strategies employed to achieve these objectives;
- Assess the effectiveness of these strategies over the past year; and
- Highlight areas where further improvements may be required.

The focus is essentially on five major areas:

- How market risk arises for the Bank
- Market risk and the on-going financial crisis
- The Bank’s strategies for managing market risk
- The effectiveness of the strategies in mitigating market risks
- Further actions to be pursued going forward.

While the review focuses on the African Development Bank, given the current crisis environment we take the opportunity to also address specific issues related to the African Development Fund portfolio.
Part 1

How market risk arises for the Bank
The financial crisis has elevated the importance of market risk

Market risk was considered a relatively small and “non-core risk” in MDBs business

Non-Development Related Exposures
- Interest Rate risk
- Currency risk
- Liquidity risk
- Other risk

Development Related Exposures
- Loans
  - Sovereign
  - Non-sovereign
- Equity Investments
- Guarantees

Since the crisis there is a shift in paradigm:
- Significant volatility in asset prices
- Credit deterioration (downgrade) of several financial institutions from AAA to A/BB+
  (Market becomes single A)
- Increasing cost of funding
- Squeeze on liquidity...

Shift in Paradigm and increasing importance of market risk

The Bank’s overarching risk management philosophy is to optimize the use of its risk bearing capacity to support the Bank’s development related activities (i.e. core business risks).

To achieve this, the Bank seeks to minimize its exposure to other sources of risk that are incidental to the Bank’s development mandate (the non-core risks).

While market risk has always been a relatively limited risk in the context of the Bank’s operations, the financial crisis has highlighted the shifting paradigm. The volatile and even uncertain asset prices, widespread deterioration in credit quality, substantial increases in funding costs and squeezes on liquidity has affected the Bank like all other MDBs.

Market risk turns-out to consume more capital resources than before and, although a non-core risk, needs greater attention and more active management.
The risk of reductions in earnings and/or value, through financial or reputational loss, arising from unexpected changes in financial prices, including interest rates, exchange rates, credit spreads and prices for bonds, commodities, equities, property and other instruments. It is measured and managed by a variety of different techniques.

Substantially all of the Bank's business activities are subject to the risk that market prices and rates will move and result in profits or losses for us. The key market risks of the Bank are classified into five types:

- Interest rate risk;
- Currency risk;
- Liquidity risk;
- Counterparty risk; and
- Equity price risk.

The increased prominence of trading activities and use of new products for private sector activities as well as initiatives to respond to the financial crisis has highlighted Bank exposure to market risk. Recognizing the growing importance of such non-core risks in the Bank's operations, Management have improved the processes and procedures to measure and to manage these associated risks, while ensuring adequate internal controls and capital resources to address these risks.

Prominent among the steps taken by Management is the integration of market risk in the revised capital adequacy framework and strengthening the market risk exposure management.
Market Risks in the Bank’s Balance Sheet and Income Statement

**Balance sheet risk** - Market risk is inherent in the financial instruments associated with the Bank’s assets (loan, equity participations, investments earmarked for trading or held to maturity portfolios) and liabilities (borrowings and related derivatives), credit risk mitigation, etc. Mismatches of assets and liabilities over a particular time period gives rise to a net asset or liability position. The mismatch could be in terms of currency, interest rate or maturity structure. Any risk generated out of a mismatched balance-sheet position, if left uncovered, could generate potential loss or gain in the event of rate changes.

**Income statement risk** – Effect of market rate changes in the value of assets (A) and liabilities (L) as well as interest sensitive instruments associated with A&L positions are reflected in the levels of future income and expenses produced by these positions. In times of high market volatility, unhedged positions would also make net income net income volatile.
Part 2

Market risk and the financial crisis
Increasing market Risk as result of the Financial Turmoil

Following the financial crisis, all banks are operating in a rapidly changing environment. Market, liquidity and counterparty credit risks have risen. Markets have become more volatile and credit protection costly as highlighted by this graph which provides a high level overview of the period since the beginning of the credit / financial crisis, which is generally considered to have begun around the first quarter of 2007.

The graph uses the North American Investment Grade credit default swap as a proxy to reflect the impact of the credit crisis.

It shows, over time, the cost (in $ ‘000) of purchasing credit protection on the index, per $10 million of protection. From a pre-crisis level of below $40,000, it moved to a peak of $280,000 by end 2008 and has since recovered to around $140,000.

The situation still remains volatile and could have some impact on the Bank’s funding and operational activities.
10-year swap rates

This graph shows the evolution of 10-year swap rates for the EUR, the GBP, the JPY, the USD, and the implied SDR rate since 2001.
Financial crisis … an overview

The evolution of the 6M LIBOR …. 

6 months LIBOR

This graph shows that the short term interest rates decreased in all of 3 currencies in the SDR basket that is, EUR GBP and JPY.
The crisis means we are operating in a vastly changed and rapidly changing environment.

- Widening credit spreads in all asset classes, bond and equity markets have become more volatile
- Absence of transparent prices and active secondary markets for many products raise concerns about valuations and size of potential losses
- Disrupted money markets created funding difficulties for a number of financial institutions
- Counterparties have been reluctant to lend to institutions they perceive may be holding lower-quality, illiquid assets
- Government bailout programs yielded a flight to quality and increased cost of funds even for AAA institutions.

Responding to the Financial Crisis – New challenges and imperative for strengthening risk management

The crisis has changed the financial landscape for all institutions, including the Bank.

Impact on market risk includes a break in traditional risk management strategy (Models are no longer effective in predicting stress events), asset-price uncertainty, ineffective hedge behavior, sizable ratings downgrades that yield to indirect deterioration of portfolio quality and pressure on net interest margins.

Distorted and illiquid market conditions has yielded valuation challenges for the investment, borrowing and derivatives portfolio.

Also in a distressed liquidity and credit environment, prevailing market prices are often significantly lower ("fire-sale") than expected recovery values. Therefore despite the credit downgrades of counterparties, positions cannot be easily liquated.

All these events have impacted on net income of the Bank through realized and unrealized gains and losses.
The financial crisis has exposed many weaknesses across the entire financial system. “The Chief Executive of Goldman Sachs, a global investment bank, provides an excellent summary of some of the key lessons and important principles for the banking industry emerging from the crisis”.

“The first is that risk management should not be entirely predicated on historical data. In the past several months, we have heard the phrase “multiple standard deviation events” more than a few times. If events that were calculated to occur once in 20 years in fact occurred much more regularly, it does not take a mathematician to figure out that risk management assumptions did not reflect the distribution of the actual outcomes. Our industry must do more to enhance and improve scenario analysis and stress testing.

Second, too many financial institutions and investors simply outsourced their risk management. Rather than undertake their own analysis, they relied on the rating agencies to do the essential work of risk analysis for them. This was true at the inception and over the period of the investment, during which time they did not heed other indicators of financial deterioration. This over-dependence on credit ratings coincided with the dilution of the coveted triple A rating. In January 2008, there were 12 triple A-rated companies in the world. At the same time, there were 64,000 structured finance instruments, such as collateralised debt obligations, rated triple A. It is easy and appropriate to blame the rating agencies for lapses in their credit judgments. But the blame for the result is not theirs alone. Every financial institution that participated in the process has to accept its share of the responsibility.

Third, size matters. Whether you owned $5bn or $50bn of (supposedly) low-risk super senior debt in a CDO, the likelihood of losses was, proportionally, the same. But the consequences of a miscalculation were obviously much bigger if you had a $50bn exposure.

Fourth, many risk models incorrectly assumed that positions could be fully hedged. After the collapse Long-Term Capital Management and the crisis in emerging markets in 1998, new products such as various basket indices and credit default swaps were created to help offset a number of risks. However, we did not, as an industry, consider carefully enough the possibility that liquidity would dry up, making it difficult to apply effective hedges.

Continued…
Fifth, risk models failed to capture the risk inherent in off-balance sheet activities, such as structured investment vehicles. It seems clear now that managers of companies with large off-balance sheet exposure did not appreciate the full magnitude of the economic risks they were exposed to; equally worrying, their counterparties were unaware of the full extent of these vehicles and, therefore, could not accurately assess the risk of doing business.

Sixth, complexity got the better of us. The industry let the growth in new instruments outstrip the operational capacity to manage them. As a result, operational risk increased dramatically and this had a direct effect on the overall stability of the financial system.

Last, and perhaps most important, financial institutions did not account for asset values accurately enough. I have heard some argue that fair value accounting – which assigns current values to financial assets and liabilities – is one of the main factors exacerbating the credit crisis. I see it differently. If more institutions had properly valued their positions and commitments at the outset, they would have been in a much better position to reduce their exposures.

Risk and control functions need to be completely independent from the business units. And clarity as to whom risk and control managers report to is crucial to maintaining that independence. Equally important, risk managers need to have at least equal stature with their counterparts on the trading desks: if there is a question about the value of a position or a disagreement about a risk limit, the risk manager’s view should always prevail.

We should apply basic standards to how we compensate people in our industry…

Capital, credit and underwriting standards should be subject to more “dynamic regulation” …

The level of global supervisory co-ordination and communication should reflect the global interconnectedness of markets....
Bank’s Market Risk Management Strategies

The strategic guidelines for managing market risk are provided by the General Authority on Assets and Liabilities (the “Authority”, the “General Authority” or the “ALM Authority”). It sets out the guiding principles for managing the Bank’s currency exchange rate, interest rate, liquidity, counterparty credit and operational risk.

However, in recent years market risk management has become increasingly complex not only because of more complex financial trading instruments but in relation to the evolution of the risk associated with a traditional balance sheet.

This has called for further development in the ALM practices, internal risk governance and oversight.
Market Risk Management, Oversight and Monitoring Framework

The Bank’s market risk management policies and strategies are managed under the ALCO control framework (Asset and Liability Management Committee). The ALCO control framework is supported at three primary levels.

1. **Asset and Liability Management Authority**: A Board approved umbrella document which is a single comprehensive policy document for market risk, covering currency, interest rate & liquidity risks.

2. **ALM Guidelines**: A set of Guidelines for the Bank’s asset and liability management operations developed by Management and approved by the President, and providing specific parameters and rules within which the Bank’s ALM operations are undertaken.

3. **Implementation structure**: This structure consists of detailed processes that are implemented through advanced treasury IT control systems by a team of finance specialists.

Within this framework, ALCO’s role is to:

- ensure sound integrated Bank-wide risk management;
- monitor and report on overall Bank financial issues;
- advise the President and provide guidance to the business units involved in the Bank’s asset and liability management operations; and
- set broad guidelines in the areas of risk control, capital allocation, financial performance, and balance sheet structuring.

The Bank’s ALM framework is continuously improved to meet industry best practices. Risk Management coordinates ALCO activities and develops updated risk policies and procedures.
Institutional Risk Monitoring and Reporting Organs

ALCO is supported in its work by a number of technical working groups comprising staff from across departments and complexes that meet regularly to review levels of market risk exposure, compliance with limits and guidelines as well as risk policy.

These working groups make recommendations to ALCO on aspects of hedging and / or rebalancing of positions, monitoring, compliance and performance reporting.

There are currently several periodic reports (monthly, quarterly and annually) that are prepared by seven standing working groups under the coordination of the Financial Management Department:

- interest rate risk working group;
- currency risk working group;
- financial projections working group;
- financial products working group;
- country risk working group;
- non-sovereign credit risk working group; and
- operational risk working group.
Market Risk Management – A dynamic process

Effective risk management requires that key critical risk assessment processes and tools are in place to factor market dynamics in identifying and measuring risks, and setting risk limits.

The management of dynamic positions lies not only on benchmark tracking and single risk indicators (VaR) but also on simulation, stress testing and scenario analysis on “What if” new positions are added, portfolio quality deteriorated or systemic risk appears suddenly in the markets.

The Bank’s stress testing is designed to analyze the reactions of portfolios to risk factor shocks, with the objective of verifying the capacity of the Bank to absorb losses and identify possible measures to be taken to reduce risks.

Quantitative and qualitative limits are defined to guarantee an adequate level of diversification and the maximum acceptable losses.

The above analyses drive portfolio diversification efforts across markets and within markets, across sectors and instruments.
Section 1
Currency Risk Management
The Bank’s currency risk management objectives and principles

Currency risk is the potential loss due to adverse movements in market exchange rates. It embeds: (i) currency translation risk which is the potential loss in the value of an asset or liability denominated in one currency when its value is expressed in another currency and (ii) currency transaction risk when an asset or liability in one currency is exchanged into another currency.

The Bank’s currency risk management policy strives to achieve two principal objectives:

- to protect risk capital from currency transaction and translation risks due to fluctuations in currency exchange rates
- to protect the budget from cost over-runs due to exchange rate movements (because of differences in the currency in which the Bank reports its budget, the Unit of Account, and the currencies in which it actually makes its administrative expenditures).

The general principle to mitigate such risks is to maintain the currency profile of the Bank’s net assets (i.e. the difference between assets denominated in currencies and the liabilities denominated in the same currencies) with its currency benchmark (SDR = UA).
Sources of Currency Risk in the Bank’s Operations

The potential sources of currency risk in the Bank’s operations are numerous, including borrowings, investments, loans, equity investments and administrative expenses.

**Loan portfolio** – the Bank offers single-currency pool-based loans and market-based loans in various currencies (e.g. USD, EUR, JPY, ZAR) as well as limited local currency loans. It may also conduct currency purchases to fulfill client disbursement or repayments requests, or may intermediate a client risk management product, such as currency swaps. All these operations may expose the Bank to currency risk.

**Investment and funding** – the bank may conduct cross-currency investment transactions or funding related swaps provided the Bank has no residual exposure.

However, as we note in this table, most of the assets are funded in the same currency either directly or by utilizing swaps to align to the appropriate currency. This results in a net currency position on the balance sheet which needs to be mitigated. The first currency risk management objective reflects this as we will see later.

**Administrative Budget** – The Bank budgets for its administrative expenses in UA. However, since actual expenditures are paid in currencies, if exchange rates fluctuate, the UA value of expenses will also fluctuate. The volatility introduced by exchange movements to the UA value of expenditures depends on both the volatility of the market rates and the actual currency composition of these expenses.
Currency Risk Mitigation Strategy

In order to protect the Bank’s risk capital (the Bank’s risk bearing capacity) from exchange rate movements, the Bank aligns the currency composition of its equity with the currency composition of the SDR.

Given the mechanical relationship between the value of the four currencies making up the SDR and consequently the UA, if the currency composition of equity is aligned with that of the SDR, then fluctuations in market exchange rates will have perfectly off-setting effects on the UA value of the Bank’s equity.

As illustrated graphically above, the Bank determines the currency composition of its equity by deduction.

The first step is to determine the currency composition of its various asset portfolios (loans, investments, etc).

The next step is to compute the currency composition of its liabilities (mostly borrowings).

The currency composition of the Bank’s equity is then computed by subtracting the currencies of liabilities from the currencies of assets.

Instruments used to mitigate this risk are foreign exchanges options, currency swaps, futures, etc. These instruments help insulate the Bank net assets and net income against losses that may arise due to volatile movements in FX rates.

At the end of 2008, the Bank’s equity was closely aligned to the SDR benchmark.
Effectiveness of the Bank’s currency alignment strategy with SDR

This chart shows the currency mismatches at the end of 2008, adjusted for currency trades carried out in January 2009 to maintain alignment to the revised SDR basket.

Since the SDR consists of only four currencies, ideally the composition of the Bank’s equity would be limited to those currencies.

Practically, however, there is a small residual amount of African currencies that the Bank is unable to convert into the SDR basket. These African currencies arise primarily from the Bank’s equity investments in local currencies. As a result, the Bank must live with a small residual mismatch.

To maintain the currency composition of the Bank’s equity with the SDR currency basket, the Bank engages in periodic currency adjustment operations, generally spot market (cash) conversions of liquid assets to maintain the desired alignment. Currency alignment transactions are approved each quarter by ALCO based on the analysis and recommendations of the Currency Risk Working Group.

Let us now look at the actual impact this effort to minimize the currency mismatches has had on the objective of protecting the UA value of the Bank’s equity.
Effectiveness of the Bank’s hedging strategy - Reduced volatility in translation gain and losses

This chart presents the year-on-year percentage changes of the UA value of the Bank’s equity due to fluctuations in the currency exchange rates (blue line) compared to changes in market exchanges rates (red line) since 1986. The USD/SDR exchange rate is used as a proxy for market exchange rates.

It can be observed that while the USD/SDR rate has fluctuated by more than +/- 5%, the impact of this volatility on the Bank’s translation adjustments in the past few years has been relatively small.

In 2008, the Bank’s translation adjustments moved by less than 0.25%, despite the sharp movements in exchange rates during the financial crisis; this impact can be considered well within the expected tolerances.

This demonstrates that the Bank’s currency risk management strategies are effective and functioning as expected.
Stress Testing and Currency Risk Sensitivity Analysis

In accordance with the applicable International Financial Reporting Standards, the Bank is required to disclose in its financial statements, the sensitivity of the Bank’s balance sheet to currency exchange rate movements. The Financial Management Department is responsible for testing the sensitivity of the balance sheet and effectiveness of hedges.

The risk indicator measured using the sensitivity analysis for 10% parallel shift i.e. 10% appreciation/depreciation for each currency in the UA basket against the USD is reflected in the table above. The effect of a 10% appreciation/depreciation of each African currency against the UA is also included.

<table>
<thead>
<tr>
<th>Currency</th>
<th>Movement</th>
<th>Value</th>
<th>No Hedging</th>
<th>Fully Hedged</th>
<th>Loss (In UA million)</th>
<th>In Taps</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUR against USD</td>
<td>↑</td>
<td>10%</td>
<td>4.661</td>
<td>4.660</td>
<td>1.18</td>
<td>2</td>
</tr>
<tr>
<td>GBP against USD</td>
<td>↑</td>
<td>10%</td>
<td>4.658</td>
<td>4.660</td>
<td>-2.15</td>
<td>5</td>
</tr>
<tr>
<td>JPY against USD</td>
<td>↑</td>
<td>10%</td>
<td>4.659</td>
<td>4.660</td>
<td>-0.96</td>
<td>0</td>
</tr>
<tr>
<td>African Currencies against SDR</td>
<td>↓</td>
<td>10%</td>
<td>4.657</td>
<td>4.660</td>
<td>-3.43</td>
<td>7</td>
</tr>
</tbody>
</table>

- The net long position in African currencies is mainly due to the Bank’s Equity investment in local currencies.
- Going forward, the challenge is to minimize this risk.
Residual Currency – SDR micro-structure tracking error

In 2005, the Bank observed that there were small differences between the theoretically correct SDR exchange rates and the rates computed by the IMF due to the methodology used to value the SDR basket vs other currencies. These small differences have led to small but persistent “tracking errors” between the Bank’s actual translations gains and losses and the predicted variances.

Although the variances can be addressed by the use of ‘derived’ SDR exchange rates slightly different from the IMF’s published rates, the Bank has maintained the use of the published IMF rates and continues to monitor the effect of this tracking error.

As shown in this graph, the bulk of the actual translation loss reported in the Bank’s income statement is a result of this tracking error.
Effectiveness of the Hedge of the Administrative Expenses Budget

The Bank budgets for its administrative expenditures in Units of Account. However, since actual expenditures are paid in currencies, if exchange rates fluctuate, the UA value of expenses will also fluctuate. The impact of exchange movements on the UA value of expenditures depends on both the volatility of market rates and the actual currency composition of administrative expenditures. The table above shows the currency composition of 2008 administrative expenditures compared to the SDR basket.

Although differences exist between the SDR and the composition of the Bank’s expenses, a large part of the exchange risk is neutralized by the fact that salaries for professional staff and elected officials are denominated in UA. The residual expenditures denominated in currencies shows that the bulk is in Euro or currencies such as CFA linked to Euro. This implies that if the Euro appreciates versus SDR the actual UA value of Bank’s expenditures would also rise, which could inadvertently cause a budget over-run. The relocation of the Bank to Tunisia since 2003 has also resulted in increased exposure of the budget to the Tunisian Dinar.

The Bank protects itself from potential budget over-runs due to exchange rate movements by “hedging” the currency composition of its projected expenditures. To do this, the Bank purchases and sells currencies in the forward market to align the composition of projected expenses with the SDR. So far the hedge has been effective but new avenues are being explored to improve the currency management of through its periodic implementation.
In summary... The Bank's currency risk management strategies have been effective in reducing (but not eliminating) currency risk

- The Bank minimizes the impact of exchange rate movements on its risk bearing capacity and its administrative expenses
- Translation adjustments minimized by maintaining alignment of net assets with the SDR basket
- Hedging administrative expenses has helped to reduce the risk of budget over-runs due to exchange rate movements
- Currency exposure of equity investments in local currency needs to be closely monitored to minimize losses due to currency movements (exaggerated by equity price risk)
Section 2
Interest Rate Risk Management
The Bank’s interest rate risk management objectives and principles

Interest rate risk is the potential loss caused by changes in market interest rates. The risk is generated by imbalances between the structure and maturities (re-pricing) of assets and liabilities in the Banks portfolios.

Although the Bank does not pursue the maximization of profitability, it is nevertheless important to have a steady level of operating income in order to strengthen the Bank’s risk bearing capacity and to enable income allocations to other important development initiatives.

The key driver of the Bank’s net income is the net interest margin it earns between the return on its assets and the cost of debt and equity funding those assets.

As a result, the principal interest rate risk management objective is to protect the net interest margin from short-term movements in market interest rates.

Since 2005, the Bank opted to utilize the Fair Value Option for the valuation of elected borrowings and associative derivate transactions. However, in the current volatile and uncertain financial environment, ensuring a fair trade-off between stabilization of the economic value of equity and net interest margin becomes an inevitable challenge for managing interest rate risk.

The basic interest rate risk management philosophy is match-funding complemented by stress – testing and scenarios analysis.
Sources of Interest Rate Risk in the Bank’s Operations

Similarly to currency risk, the potential sources of interest rate risk in the Bank’s operations are numerous, including borrowings, investments, loans and derivatives. However, as noted in the above table, derivatives are used to match the two sides of the balance sheet.

Interest rate risk is a direct consequence of the Bank’s financial intermediation role. The Bank carries a variety of both fixed and floating rate assets and liabilities, many of which are subject to re-pricing when interest rates change. If short term liabilities and long-term fixed rate assets dominate the Balance sheet, it would be subject to losses when interest rates rise. With the reverse structure, losses would be incurred when rates fall.

Also, loans and non-trading investment portfolios are reported at amortized costs. While the accounting rules require a historical view of those assets, these positions are still subject to change in economic value based on varying market conditions and the effect of these changes is reflected in income. Trading portfolio positions are maintained at market value with changes reflected in income through realized and unrealized gains and losses.

Interest rate risk management therefore focuses on the determination of interest rate sensitivity and gaps of the balance sheet and the implementation of risk management practices to hedge the potential effects of interest rate changes.

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### Sources of Interest Rate Risk

<table>
<thead>
<tr>
<th>Sources of Interest Rate Risk</th>
<th>Risk Management Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrowings</td>
<td>Cost driven; Swapped to match benchmarks (fixed, floating)</td>
</tr>
<tr>
<td>Loans</td>
<td>Matched with benchmarks; Non-standard loans create mismatches, managed at a macro-level</td>
</tr>
<tr>
<td>Treasury investments</td>
<td>Matched with benchmarks; Trading – floating or hedged; Held to maturity - fixed</td>
</tr>
<tr>
<td>Derivatives</td>
<td>Used to align investments, loans and borrowings to benchmarks</td>
</tr>
<tr>
<td>Mismatches between assets &amp; liabilities</td>
<td>Gap analysis and re-balancing</td>
</tr>
<tr>
<td>Pre-payment</td>
<td>Pre-payment premium for fixed rate loans</td>
</tr>
</tbody>
</table>

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*Interest rate risk management strategies*...
Effective risk management is not solely restricting risk but creating a natural offsetting mechanism to “immunize” the balance sheet. The principle underlying that approach is match funding i.e. funding assets (loans and investments) with liabilities having the same characteristics in terms of interest rate (fixed or variable), currency and maturity (short, long).

The diagram above depicts a simplified form of the interest rate structure of the Bank’s balance sheet. To protect its net interest margin from movements in market rates, the Bank’s strategy is to match the interest rate sensitivities of both sides of the balance sheet. To achieve the desired matching the Bank’s balance sheet is notionally divided into two components.

**Floating rate assets and liabilities** (zig-zag arrows) in which their interest rates adjust periodically in line with short-term market rates and consisting of:
- borrowings;
- liquid investments; and
- floating rate loans.

**Fixed rate assets and liabilities** (straight line arrows) whose interest rate does not change until maturity regardless of changes in market interest rates and consisting of:
- equity capital (paid-in capital plus accumulated reserves). Because the Bank pays no dividend to shareholders, the effective cost of equity is fixed at zero with no maturity;
- fixed rate loans;
- Held-to-maturity (HTM) or “equity-backed investment” (EQB) portfolio.

### Match funding principle to insulate the balance sheet

- Funding investment and loans with liabilities having the same characteristics in terms of interest rate (fixed or variable), currency and maturity.

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**Table**

<table>
<thead>
<tr>
<th>Rate Component</th>
<th>Assets</th>
<th>Liabilities</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floating Rate Components</td>
<td>Loans</td>
<td>Debt</td>
<td>6 month Libor</td>
</tr>
<tr>
<td></td>
<td>Liquid Invest.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Rate Components</td>
<td>Loans</td>
<td>Equity</td>
<td>Re-pricing profile</td>
</tr>
<tr>
<td></td>
<td>HTM Investments</td>
<td></td>
<td></td>
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</tbody>
</table>

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**Interest Rate Risk Management**

In line with the match funding principle, the Bank shall to the extent possible, match the interest rate risk profile in alignment with the relevant benchmarks at the level of each asset and liability group.

**Floating rate components** of the balance sheet are managed against a 6 month Libor interest rate benchmark to “lock-in” the Bank’s net interest margin regardless of future rate movements.

**Variable rate components** are funded on a pool basis using a mix of fixed and floating rate instruments.

**The fixed rate components** are managed against a re-pricing profile benchmark to generate a steady return on equity as their interest rates do not change until maturity regardless of changes in market interest rates.
Re-pricing profile benchmark to align interest rate sensitivity of assets

For the fixed rate components, the Bank uses a uniform 10-year re-pricing gap ladder (blue bars), whereby 10% of the Bank’s assets funded by equity (otherwise known as net interest sensitive assets) mature or re-price in any given year.

Ideally, the re-pricing profile of the Bank’s fixed rate assets (red bars) would be perfectly aligned to the benchmark and would thereby ensure that the Bank’s interest income would not be affected by short-term fluctuations in market rates while being adequately responsive to general market trends.

To maintain alignment with the benchmark, the Bank manages the mix of fixed rate loans and equity-backed investments. As illustrated above, at the end of 2008 the Bank was reasonably well aligned with the benchmark although there was a shortage of assets re-pricing in years 7, 8 and 9 which was offset by excesses in the early buckets.

Adjustment transactions are executed on an ongoing basis, using HTM assets and macro-hedge swaps, to improve the alignment of net assets with the benchmark, based on an analysis and recommendation of the Interest Rate risk Working Group and approved each quarter by ALCO.

Let’s now look at some data to see how effective this broad strategy has been.
Stabilising Effect of Held to Maturity Portfolio

The Bank’s internally managed investment portfolio consists of two components the Trading portfolio managed against a 6 month Libor benchmark and the held to maturity (HTM) or equity backed portfolio using a re-pricing profile.

The impact of the financial crisis is evident from the volatility of investment returns on the trading portfolio, which is held primarily for liquidity risk management purposes.

In line with the interest rate risk management strategy to protect the net interest margin from interest rate movements, the held-to-maturity portfolio provides a stabilizing effect.
Effectiveness of the Interest Rate Risk Management

This graph shows the year-on-year percentage change in the Bank’s net interest margin (red line) and changes in short-term market rates (blue bars) using USD 6 month Libor as a proxy for market interest rates.

Net interest margin (NIM) = gross loan income + investment income (interest earned plus capital gains or losses) - total financial charges for the year. To isolate the interest rate effects, this analysis factors out fluctuations in loan income due to credit events such as changes in accrual status or increases and decreases in arrears and it has been normalized by dividing by the average equity or net worth in each year.

Despite continued sharp changes in the market interest rates, the impact on the Bank’s NIM has been relatively small over the past decade.

This limited impact of volatile market conditions demonstrates the general effectiveness of the Bank’s interest rate risk management strategies.
Stress Testing and Interest Rate Risk Sensitivity Analysis

While the Bank strives to match both sides of its balance sheet as described a short while ago, in practice there will always be small residual mismatches which expose the Bank to profits or losses as interest rates fluctuate, resulting in an interest rate re-pricing gap.

The sensitivity to fluctuating interest rates as a result of this gap is shown above at UA 6 million, assuming a parallel shift of 100 basis points in the SDR interest rate curve.

Interest rate movements also impact the values of assets and liabilities that are reported in the Bank’s financial statements at fair value through the income statement. These components include held for trading investments, fair valued borrowings and derivatives. The sensitivity of these components to a parallel shift by 100 basis points of each of the currencies in the trading, borrowings and derivatives portfolios (20 basis points for JPY because of the low level of JPY interest rates) is:

- UA 4.1 million for trading portfolio
- UA 180 million for borrowing and derivative portfolio.
Prepayment Risk

Over the past few years the Bank has experienced varying but declining levels of loan pre-payments, partly as a result of the lower volume of outstanding high interest rate loans which were not subject to a pre-payment premium and also as a result of the availability of substantial amounts of low cost and even concessional resources.

The drying up of liquidity and alternative sources of finance during the financial crisis, has seen the lowest level of pre-payments in many years (UA 17 million) and it is not expected that this trend will change substantially in the short term.
In summary...

- The Bank strives to minimize the impact of movements in market interest rates on its net interest margin.

- Interest rate gap analysis and quarterly rebalancing help to monitor interest rate risk in the balance sheet.

- Maintaining alignment with the interest rate benchmarks has helped to stabilize the Bank's net interest margin despite the continued fluctuations in market interest rates.

- Key challenges to maintain the stability of the Net Interest Margin will continue to be monitored during the year 2009.

- Although the Bank's interest rate risk management strategies are having the desired effect, further refinements to formulate possible solutions to address the risks associated with the winding down of the old risk pooling loans and to formulate specific strategies for local currency operations.
Section 3
Liquidity Risk Management
The Bank’s liquidity risk management objective and principles

As a development finance institution funding long term projects, that borrows funds and holds them in liquidity for disbursements based on the project/program implementation schedule, the Bank faces two broad types of liquidity risks:

1. **Insufficient liquidity to meet cash flow needs in a timely manner** including the adverse impact on reputation caused by the inability to maintain normal lending operations; and

2. **Inability to sell an investment or buy-back a short position at a reasonable price within the required period of time.**

For the first type of liquidity risk, the Bank’s risk management objective is to be able to meet all probable cash flow needs for a one year horizon without additional financing from the capital markets. With regard to the second type of risk, the Bank’s principal investment strategy is to ensure that trading investments can be liquidated promptly and without incurring undue transactions costs under normal market conditions (i.e. marketable and easily liquidated securities).

Overall, the primary liquidity risk management objective is to fully mitigate the risk of a shortfall in liquidity. Adequate liquidity is a critical factor under-pinning the Bank’s strong credit rating.

The financial crisis has highlighted the importance of a strong liquidity position for many institutions. While the financial markets have been under stress during the crisis, the Bank has held a large cash cushion and has still been able to access new resources from the capital markets, although at higher cost as has been the case for all borrowers including MDBs.

Given the Bank’s strong credit rating, the likelihood of a severe stress liquidity scenario is considered to be unlikely.
Liquidity Risk Management Framework

The liquidity risk management framework is designed to identify, measure and manage liquidity risk. The risk mitigation strategy is at an operational and prudential level and also deals with tactical liquidity risk management dealing with the structure and liquidity characteristics of the investment portfolio (marketability, exposure by rating and instruments). This framework has been instrumental in maintaining adequate liquidity and funding.

The prudential minimum level of liquidity (PML) is the primary mechanism for managing liquidity risk. The PML sets the minimum level of liquid assets that the Bank must maintain at all times and is computed quarterly as the projected net cash requirement over a rolling one-year horizon. The rationale for quarterly updating is to ensure that PLM closely tracks the Bank’s actual cash flow requirements.

The components of the net cash requirement are shown in the table.

The level and timing of expected disbursements is the most critical parameter in effective liquidity risk management, especially in the context of the Bank’s response to the financial crisis and particularly as the Bank concludes larger loans many of which are also fast disbursing.
Compliance with the PML is monitored continuously and only truly liquid assets are considered as “eligible” for the liquidity policy. This includes all cash, deposits and trading investments. It also includes investments designated as “held to maturity” (HTM) if the remaining maturity is less than one year. In practice, this means that investments in the equity-backed portfolio longer than one-year are not considered as liquidity for the purpose of this policy. Nevertheless, these HTM investments do provide an additional cushion in the unlikely event of a severe liquidity squeeze.

This graph shows the evolution of the PML and the actual level of liquidity.

As can be observed, the actual level of liquidity has remained consistently above the prudential minimum prescribed by the policy. This gives assurance that the Bank had more than sufficient liquidity to meet one-year’s net cash requirement in the event of a market disruption.
Liquidity characteristics – Marketability of the Trading Portfolio

To minimize the liquidity risk in its investment portfolio the Bank shall establish criteria for the minimum characteristics of all investments and related transactions. The table above shows the current portfolio.

The maturity structure of the trading portfolio which is held for liquidity management purposes shows that some 63% of assets are held with very short maturities (less than 3 months). A large portion of that maturity bucket consists of cash and deposits.

These short term instruments have relatively low investment returns and therefore contribute to the cost of carry and lower investment performance.
In summary...

- Minimum level of liquidity set at projected net cash requirement for a rolling one-year period and the risk of a liquidity shortfall is minimum.

- Liquidity is currently well above the PML. However PML is expected to be revised upward due to fast disbursements required to respond to the crisis.

- Need to closely monitor the level of liquidity in order to minimize the cost of carry.
Section 4
Counterparty Risk Management
Counterparty Risk Management Framework

Counterparty risk is the potential for financial or non-financial (reputation) loss if a counterparty to an asset and liability management transaction is unable or unwilling to honor a contractual obligation to the Bank. While counterparty risk is generally not considered to be a true market risk like interest rate or currency risk, it manifests itself through changes in the prices of assets and liabilities resulting from changes in the counterparty credit risk. This has been well demonstrated in the context of the financial crisis.

Counterparty risk is distinct from the core credit risks incurred in the Bank’s normal sovereign and non-sovereign lending operations.

The Bank incurs exposure to counterparty credit risk through its treasury activities, notably, trading and investments, borrowings and associated derivatives activities.

The trading and investment activities consist of the funds that are held in bank accounts or invested in a variety of financial instruments, including securities.

Borrowing and Derivatives - The Bank also incurs exposure to counterparty credit risk when it engages in derivative transactions such as swaps with a derivative counterparty. Although most swaps have a fair value of zero at inception, over time the evolution of market rates can cause the fair value of swaps to change either in favor of the counterparty or the Bank. To the extent that the fair value of swaps results in the counterparty owing the Bank at any given point in time, the Bank is exposed to counterparty credit risk.

The Bank seeks to reduce the risk that a counterparty default or rating downgrade could cause either a financial loss or damage the Bank’s reputation through a prudential framework consisting of: (i) approved counterparties; (ii) minimum credit rating standards; (iii) counterparty exposure limits, and (iv) counterparty credit risk mitigation measures.
The Prudential framework

Counterparty credit risk is managed through 4 mechanisms:

1. **Approved counterparties.** All new counterparties (investment, trading or derivative counterparties) must be formally approved by the Vice President, Finance based on the business justifications from FTRY and the risk analysis from FFMA. Approved list is reviewed and validated periodically.

2. **Minimum credit ratings** for all approved counterparties to reflect the credit risks inherent in different types of transactions. Generally, higher ratings would be required for longer term and more complex transactions.

3. **Exposure limits** for each approved counterparty. Generally, the limits are larger for higher rated counterparties and for counterparties with a larger risk capital base. The exposure limits are also linked to the ADB’s risk bearing capacity.

4. **Risk mitigation.** All derivative counterparties to complete standardized documentation that allows for “netting” of exposures from multiple transactions with a single counterparty. This generally reduces the net exposure. A key risk mitigation factor is diversification of exposures across a broad base of counterparties.

During the financial crisis and as a measure of prudence, the Bank has further managed its exposures by for example, restricting its activities and limits with certain counterparties which were facing particular problems.
Evolution of the Bank’s counterparty exposure

Despite the crisis that has resulted in “the market” becoming the equivalent of a single “A credit”, the Bank endeavoured to limit its exposure to AAA and AA counterparts.

This graph shows the evolution of the Bank’s counterparty credit exposures since 1999 (AAA, AA = AA- to AA+, A = A- to A+). As can be observed, the Bank’s overall exposure to counterparty credit has increased substantially over the past decade.

While total counterparty exposures have increased over the years, it is important to note that the rating profile of this exposure has also improved over time. For example, the share of AAA rated counterparties in the Bank’s total exposure has nearly doubled from 30% in 1999 to around 60% in 2008.

The financial crisis has seen a “flight to quality” which is reflected in the increase in AAA rated exposures. It has also resulted in an increasing number of lower rated counterparties due to the rating downgrades on existing investments. In other words, the increased share of A rated counterparties is due to the current market structure dominated by single A institutions (banks).
As part of the overall counterparty exposure management strategy, the Bank targets a distribution of both trading and HTM investment portfolio around high credit quality instruments.

For government and agency obligations with final maturity longer than one year (such as the case for HTM portfolio), the Bank may only invest with counterparties or unconditionally guaranteed by governments of member countries or official entities having a minimum credit rating of AA-. For asset-backed securities, the Bank may only invest in securities with AAA credit rating. Investments in money market instruments are restricted to instruments having maturities of not more than 1 year and a minimum credit rating of A.

The above table breaks down the investment portfolio by rating. Double A or better rating account for 78% of the portfolio and single A 22%.

The HTM portfolio is dominated by triple A names, while the trading portfolio mirrors a distribution which factors selective trading opportunities while minimizing default risk.
While the Bank has managed to avoid many of the areas which have experienced the brunt of the crisis, it has nevertheless not escaped it totally.

For 2008, realized and unrealized losses of UA 63 million were recorded in the trading portfolio, mainly due to widening credit spreads (declining values) of securities. The investment in Golden Key, which defaulted in August 2007, remains in default and has been impaired to a level of 56% (held at 44% of nominal value).

While the trading portfolio is recorded at fair value with profits and losses reflected in the income statement, the Bank also has exposure to two stressed entities in the held-to-maturity (HTM) portfolio, which is recorded at amortized cost. These entities are:

- MBIA, a mono-line insurer;
- AIG, one of the largest insurers worldwide and which has received substantial support from the US government.

The Bank has made a provision for impairments on these investments as reflected in the table above. In addition, the Bank also has exposure to AIG through derivative transactions. The market value of such transactions was $ 41 million at 31 March 2009 and collateral is posted by AIG against this exposure.
Largest Portfolio Exposure

This graph shows the largest exposures of the Bank, much of which remains government, supranational and agency exposure rated AAA.
Credit Exposure to Derivatives

In the normal course of business, the Bank utilizes various financial instruments to meet the needs of its borrowers, manage its exposure to fluctuations in market interest and currency rates, and to temporarily invest its liquid resources prior to disbursement. All of these financial instruments involve, to varying degrees, the risk that the counterparty to the transaction may be unable to meet its obligation to the Bank. Given the nature of the Bank’s business, it is not possible to completely eliminate counterparty credit risk.

Counterparties are classified as investment counterparties, derivative counterparties and trading counterparties. Their ratings are closely monitored on a daily basis and breaches to the minimum rating requirements are reported.

It is worth highlighting that the Bank had no exposure (securities or derivatives) to Lehman Brothers, the investment bank which failed in September 2008. A number of our MDB peers were exposed, particularly with derivative transactions.

The Bank also had no exposure to CDS (credit default swaps) in its portfolios.

Collateral Support Agreements (CSAs) form part of the risk mitigation mechanisms we referred to earlier. It provides for the counterparty to provide specified collateral to the Bank when derivatives valuations exceed certain threshold levels and enables the Bank to reduce net exposure.

During 2008, efforts were focussed on concluding CSAs with key derivative counterparties. Currently only 4 derivative counterparties have no CSA in place yet.
The Bank's Collateral Management Framework

To reduce derivative related credit risk, the Bank signs derivative master agreements (such as International Swaps and Derivatives Association contracts) and Collateral support agreements with counterparts. Such arrangements allow the offsetting of exposures arising under all derivatives contracts.

The collateral support agreement (CSA) provides risk mitigation through periodic (usually daily) exchange of collateral based on changing exposures.

This table reflects the Bank’s collateral management framework for derivative contracts and shows the exposure, collateral received, whether a CSA is in place and the frequency of valuation and collateral exchange.
Counterparty monitoring strengthened as a result of the crisis

Despite some investments being held as exceptions (in breach) of guidelines as a result of credit rating downgrades of counterparties, the Bank has maintained the minimum rating requirements in investment guidelines.

All investments which breach the guidelines are evaluated and a recommendation to maintain or sell the exposure is made to ALCO.

Exceptions are also regularly reported to the Board (AUFI) for information.
Counterparty exposure risk management

As has been reported to the Boards, some investments have been downgraded and are held as exceptions to the ALM guidelines. Two points are worth noting:

1. 76% and 13% of investments in the trading and HTM portfolios respectively will reach maturity by end 2010;

2. Since the minimum rating requirements for any investment are lower for shorter maturities, it is possible for exceptions to move back within the guidelines over the passage of time.
The funds managed by external managers, currently some UA 123 million, have also been affected to a similar extent. These funds are largely invested in MBS securities.
**Impact of Market Risk on the Bank’s income and equity**

This table illustrates the impact of market risk as reflected in the Bank’s financial statements. MTM reflects those instruments which are valued at fair value (marked to market) and for which profits and losses are reflected in the income statement. This is the Bank’s trading portfolios and all derivatives.

HTM represents the investments held to maturity and valued at amortized cost, but where impairments to those assets are recognized in the income statement.

Available for sale represents the Bank’s equity investments where changes in fair value are recognized in equity but where impairments are recognized in the income statement.

Borrowings and related derivatives may be treated under either a fair value option (FVO) or at amortized cost. Further details on these are shown in the next slide.
Market risk associated with borrowings – increased volatility in valuation

...related realized & unrealized gain & loss

Borrowings – IFRS valuation

- Bank does not apply hedge accounting
- Borrowings are classified in two categories:
  ✓ Fair value (FVO) - generally those which are swapped
  ✓ Carried at amortized cost (Non-FVO)

Fair Value Option and income volatility

- Account for derivative and underlying borrowing on same basis (fair value)
- Reduces volatility from accounting mismatch if borrowings were at amortized cost and derivatives at fair value
- However, changes in the Bank’s own credit spread cannot be eliminated and create volatility
Change in International Financial Reporting Standards

As a result of the financial crisis and under some external pressure, in October 2008 the International Accounting Standards Board (IASB) amended the IAS 39 rule dealing with fair valuation of investments and permitted a retroactive re-classification (to July 2008) of investments from fair value through profit and loss to HTM or available for sale. The effect of such re-classification would permit the losses incurred between July and October to be removed from profit and loss and insulating them from further valuation losses going forward.
While the Bank does not make equity investments through its treasury investments, it has limited but increasing exposure to equity investments through its development related activities through the private sector. Where such equity investments are made in local currencies, currency risk also impacts overall performance of the investment.
Impact on equity investments

Some of these equity investments have been negatively impacted by the financial crisis.
**In summary...**

- The Bank strives to minimize the risk of financial or non-financial loss due to a counterparty default/downgrade.

- Although total exposure to securities that do not comply with the guidelines has grown, the Bank’s credit risk profile remains primarily dominated by counterparties rated above A+.

- A close monitoring of the portfolio continues to be performed independently by FFMA.

- Reduced exposure to ABS / MBS from 12% in 2007 to below 10% in 2008 (including under external portfolio manager mandates).

- Increased holdings of cash, government and agency securities.

- Increased exposure to AAA rated investments but rating downgrades has also meant an increased exposure to A+ and lower.
A prudent risk management philosophy has enabled the Bank to weather the financial storm

**Counterparty Credit Risk**
Credit ratings, exposure limits, maximum maturities and other risk mitigation measures

**Exchange Rate Risk**
Match the currency composition of assets with that of liabilities and hedge the net asset position to minimize currency translation risk

**Liquidity Risk**
Safety cushion of at least one year against market disruption in the capital markets

**Interest Rate Risk**
Protect the Bank's net interest margin from fluctuations in interest rates
**ADF Market Risk**

In this section we will briefly highlight the situation with respect to ADF market risks.

- ADF investment income remains very sensitive to short-term market interest rates, despite the HTM portfolio invested in long maturities.
- Similarly to the Bank, the exposure to securities that do not comply with guidelines should be closely monitored.
Liquidity risk and investment performance

As with ADB, the HTM portfolio has provided a stabilizing return compared to the volatility of the trading portfolio. Liquidity is comfortable.
Counterparty Risk

Counterparty risk for ADF has experienced a similar trend to that of ADB with a larger portion of AAA rated counterparties but also an increase in lower rated counterparties due to rating downgrades of existing investments.

The Fund also has a small exposure to AIG.
Counterparty Exposure Management

As with ADB, the ADF portfolios have also been impacted by the rating downgrades of investment counterparties and some securities are held as exceptions to the investment guidelines. Again, 92% and 11% of the trading and HTM portfolios respectively will mature by end 2010.
ADF income is very sensitive to the overall level of interest rates and returns of the HTM portfolio. Continuing low interest rates will place ADF income under strain.

ADF investment income remains very sensitive to interest rate volatility despite an HTM portfolio representing approximately 40% of ADF liquidity.

ADF may post a deficit in 2009 and in subsequent years if interest rates remain at their low level.

The interest rate for ADF ACA projections, estimated at 4.25% will be reviewed at 2.8%. All other factors remaining unchanged the ACC for ADF-12 will be reduced by approximately UA 300 millions due to lower interest rates.
Part 5

Further actions to be pursued going forward
### Key Challenges for Interest Rate Risk Management

<table>
<thead>
<tr>
<th>Key Challenges</th>
<th>Action Taken</th>
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<tbody>
<tr>
<td>• Maintain NIM stability despite crisis environment with higher funding</td>
<td>• Maintain Liquidity level close to the Prudential Minimum Level (PML).</td>
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<tr>
<td>spreads and volatile investment returns.</td>
<td></td>
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<tr>
<td>• Maintain matching of Assets and Liabilities particularly for VLR pool.</td>
<td>• Monitor the mismatch and swap excess borrowings into floating when interest rate will be favorable.</td>
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<tr>
<td>NIM is negatively impacted by excess borrowings funding the pool at high</td>
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<td>fixed rate levels.</td>
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<tr>
<td>• Review the Debt Allocation process to improve match funding principle for</td>
<td>• A revised debt allocation methodology will be presented to the ALCO committee in 2009.</td>
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<td>private sector loans, loans with long maturities and fixed rate loans.</td>
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</table>
## Key Challenges for Liquidity Risk Management

<table>
<thead>
<tr>
<th>Key Challenges</th>
<th>Action Taken</th>
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</thead>
<tbody>
<tr>
<td>• Difficulty to determine the Prudential Minimum Level as Bank’s response to</td>
<td>• Constant dialogue and communication with operations for the review of disbursement projections.</td>
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<td>crisis might result in disbursements that are not easily predictable.</td>
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<tr>
<td>• Need to strike a balance between ensuring the availability of liquidity to</td>
<td>• Continuous review of the PML level (as opposed to quarterly review) in order to take into account the</td>
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<td>meet disbursement requests and minimizing the negative impact of cost of carry</td>
<td>most recent information on disbursement projections.</td>
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<td>for liquidity.</td>
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<tr>
<td>Key Challenges</td>
<td>Action Taken</td>
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<td>----------------------------------------------------</td>
<td>-------------------------------------------------------</td>
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<tr>
<td>• Need to monitor closely the significant volume of securities not complying with guidelines of which a large portion will mature in 2009-2010.</td>
<td>• Close monitoring of prices and independent assessment of portfolio by FFMA.</td>
</tr>
<tr>
<td>• Implementation of Credit VaR for a better monitoring of credit risk related to the total investment portfolio.</td>
<td>• Start phase of the project which might require the upgrade of the IT infrastructure.</td>
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</table>
In Conclusion...

- While the financial crisis introduced additional challenges, the Bank continues to strive to minimize market risk.

- Improving the matching principle between assets and liabilities remain a key challenge.

- Several exceptions to the guidelines are still closely monitored.

- The impact of the financial crisis on the Bank has been relatively limited and should remain under control.