



The ultimate
Balance Sheet Management
& ALM solution

A financial forecasting tool at your finger tips

***Cube³⁶⁰** is a multi-dimensional financial decision modelling system, specifically designed for those institutions frequently faced with evaluations: how to fund the business or a specific project, how to hedge it or where and how to invest surplus cash.*

The unique feature of the system is that it provides the user with the modelling capabilities to simulate virtually any financial instrument the user can define. This makes the system perfectly appropriate for institutions that need to either fund from or invest in interest bearing products.

- **Cube³⁶⁰** is used for balance sheet management and specifically to evaluate the liquidity and free cash position of the institution.
- The system allows the user to budget/project the full financial position of the institution into the future. There are no restrictions on how far you wish to project into the future: 1, 2, 5 or 10 years (maximum time horizon is only limited by your computer capabilities).
- The forecasting integrity of the system is protected by complying with generally accepted accounting principles which guard the user against mistakes and one sided entries. The system also allows for mark-to-market and fair value adjustments.
- The primary objective is decision making and evaluating those decisions against the various risk profiles set in the system like liquidity, interest, market and foreign exchange rate risks. The system caters for an unlimited list of interest rate views allowing for typical Monte Carlo or VAR type analysis. Unlimited scenarios can be defined, illustrating the impact of different targets, growth percentages, new business etc. The system also provides for unlimited exchange rate views. **Cube³⁶⁰** also caters for match funds transfer pricing measuring the internal cross funding of divisions.
- All reports (see list at the end of document) are viewed by slicing and dicing in a cube-like fashion. This allows for drilling deeper or providing the opportunity to compare the impact of various interest rate views, exchange rate views and various strategies on any specified item such as cash flow, net interest income, retained income etc. **Cube³⁶⁰** has built-in statistical operators to assist the user in interpreting the results.
- Data is populated into the system by importing extraction files from the institutions' operating systems. Interest and foreign exchange rates can be imported as well predefined strategies.
- **Cube³⁶⁰** has the capability to define various business units or consolidate various models into a single unit. **Cube³⁶⁰** can be used to create a budget and has a variance analysis module.
- **Cube³⁶⁰** is in effect the rebranding of Riskflow's ALMAN system, which has been available to the market since 1988. The rebranding emphasises the focus on balance sheet management and financial decision making support.

Benefits of **Cube³⁶⁰** for the Balance Sheet / ALM / Risk Department

Balance Sheet management is aimed at finding the optimal mix of assets and liabilities given

- the expected changes in interest rates
- the expected changes in foreign exchange rates
- liquidity constrains
- capital adequacy

The purpose of a software application for managing interest rate risk, exchange rate risk and liquidity risk, is therefore to assist the Risk department in protecting and enhancing the bank's balance sheet by means of modelling / forward projecting of the cash flows and income within the given constrains, the bank's views on future interest and exchange rate changes and the strategy of the bank as pertaining to the management of their rate sensitive assets and liabilities.

Strategic management of the balance sheet is aimed at achieving sustained growth, profitability and solvency. It involves an array of management activities and responsibilities, including the formulation of long-term strategic goals and objectives and the management of associated risks. **Cube³⁶⁰** provides this within the framework of

- a system that is fully compliant with GARP (generally accepted accounting principles) and IFRS (International Financial Reporting Standards), meeting the standards of IAS39
- a graphic user interface (GUI)
- an unlimited number of rate view and strategy simulations
- a database with accessible data inputs AND simulation results
- financial analytics
- pre-defined risk reports
- reporting tools for user-defined risk, financial and management reports
- complete back-testing capabilities
- fully documented algorithms and calculation formulae

Too often rate risk measurement assumes that credit risk and liquidity risk are constant. Concurrently, credit risk measurement assumes that rate risk and liquidity risk are held constant. **Cube³⁶⁰** offers integrated credit risk, market risk, asset & liability management, and performance measurement in a single software solution. This single platform enables risk practitioners to manage ALL the risks inherent in their portfolios and to identify market opportunities.

In compliance with Basel-II requirements, **Cube³⁶⁰** offers stochastic as well as deterministic modelling, so that all models can be tested on a common platform, subject to identical tests on identical data.

How **Cube³⁶⁰** assists the Liquidity Risk manager

Liquidity risk (the potential for loss to the organization arising from either its inability to meet its financial obligations as they fall due or to fund increases in assets without incurring unacceptable loss) is considered one of the major risks for financial institutions.

The primary responsibility of the Liquidity Risk Manager is therefore to maintain adequate liquidity at all times, so that the bank is in a position (in the normal course of business) to meet all its obligations, to repay depositors, to fulfill commitments to lend and to meet any other commitments it may have made. Further, he/she must plan for unforeseen events that may cause a liquidity crisis.

Cube³⁶⁰ enables the liquidity risk manager to identify potential liquidity risk and areas of vulnerability by providing the following functionality:

- Monitoring withdrawals and customer behaviour
- Identifying unexpected outflow of funds
- Taking cognisance of unrecoverable loans and advances when projecting future cashflows
- Identifying unexpected increases in loans and advances
- Highlighting lack of funds inflow from counter parties
- Modeling (and thereby measuring the impact and effect of) diverse sources of funding
- Determining the dependence on large depositors.
- Establishing the appropriate amount of liquid assets for use in a liquidity crisis
- Ensuring that the balance sheet is not excessively weighted with illiquid assets.
- Monitoring the potential liquidity impact of off-balance sheet activity

How **Cube³⁶⁰** measures Liquidity Risk

Liquidity risk is measured by conducting an analysis of net funding requirements, which is determined by analysing future cash flows based on the assumptions on changes in rates and the expected behaviour of assets and liabilities, as well as off balance sheet items.

In its essence, the “engine room” of **Cube³⁶⁰** is the modelling of these future cash flows. By running (an unlimited number of) different rate view / strategy / behavioural combination models, **Cube³⁶⁰** evaluates the under different scenarios, namely going concern / business as usual and stress situation. Each scenario will consider significant positive and negative liquidity movements that could occur.

Cube³⁶⁰ not only measures and reports on mismatches between assets and liabilities on a contractual basis (to meet Regulatory reporting requirements).

In practice, current accounts and savings deposits are not withdrawn the next day and overdrafts are not repaid on demand. **Cube³⁶⁰** caters for this "real life" situation by also calculating these mismatches on a 'business as usual' basis. The 'business as usual' mismatch calculation predicts future cash flow patterns based on past behavioural patterns as specified by the user.

In addition to mismatch calculations, **Cube³⁶⁰** allows the user to calculate 'net liquid assets,' which is the difference between liquid assets and volatile liabilities within the portfolio. This is referred to as the liquidity gap.

Cube³⁶⁰ offers facilities for stress testing, in order to assess the extent of the bank's exposure to liquidity risk. To determine net liquidity under stressed conditions, liquidity outflow is quantified for each scenario, and cash inflows to mitigate liquidity shortfalls are identified. This also assists the Liquidity Risk manager in assessing adequacy of liquidity cushion and contingency funding.

Sound liquidity risk management requires that sources of available funds must be diversified in order for the organisation to capitalize on changes in market conditions and to be more resilient in tight market conditions. **Cube³⁶⁰** allows for the modelling of any combination of funding sources, to see the effect of different funding mixes.

Cube³⁶⁰ ensures that modelling of future cash flows meet all existing (or perceived future) regulatory requirements in terms of minimum liquid asset holdings.

Cube³⁶⁰ enables continuous monitoring of liabilities (e.g. deposits from the public) to assess the bank's ability to raise funds. Future cash flow projections calculate and highlight the funding shortfall or surplus (for each month in the modelling horizon) that will result from each modelling scenario.

Cube³⁶⁰ offers the following standard Liquidity reports:

- Liquidity need report
- Liquid asset composition report
- Capital adequacy report.

Furthermore, by virtue of the fact that all modelling results are stored in its database, **Cube³⁶⁰** allows the Liquidity Risk manager to create an unlimited number of user-defined reports using its powerful report writer.

Examples of reports that can be generated using this facility:

- actual cash flows against budget
- performance against limits
- liquid assets held per prudential requirements
- additional liquid assets held
- ratio of liquid assets to demand deposits
- ratio of non-performing assets to total assets

- ratio of short term demand deposits to total deposits
- ratio of contingent liabilities for loans to total loans
- ratio of pledged securities to total loans

By defining his / her own reports in the **Cube³⁶⁰** report writer the Liquidity Risk manager can create a report suite that will serve as early warning monitor for liquidity concerns such as:

- Concentrations in a particular portfolio of assets or liabilities
- Deterioration in asset quality
- A decline in earnings performance or projections
- Funding cost increases
- Heavy cash withdrawals
- Transaction size reductions
- A large off-balance sheet exposure

By virtue of the fact that an unlimited number of future scenarios can be modelled in **Cube³⁶⁰**, stress testing can be conducted to assess the ability of the bank to withstand stressed liquidity conditions and to determine how it will cope in such a situation. This allows for identification of expected losses and assessing the impact of unlikely but still plausible events. Stress testing in **Cube³⁶⁰** allows for any (user-specified) upward and downward basis point rate shock. Stress tests can also be performed to measure the effect of any (user-specified) reduction in deposit base.

Cube³⁶⁰'s "what-if" scenario modelling facilities can also model the effects of different potential sources of funding available, e.g.

- deposit growth
- lengthening of maturities of liabilities
- cash injections

How Cube³⁶⁰ assists the Interest Rate Risk (IRR) manager

Interest rate risk is the risk that the company will experience deterioration in its financial position as interest rates move over time.

Cube³⁶⁰ enables the IRR manager to identify, measure and monitor the following sources of interest rate risk:

Repricing Risk, which reflects the fact that assets and liabilities are of different maturities and are priced off different interest rates.

Basis Risk, which arises when there is an imperfect correlation in the adjustment of the rates earned and paid on different instruments with otherwise similar repricing characteristics. When interest rates change, these differences may give rise to unexpected changes in the cash flow and earnings spread between assets, liabilities and off-balance sheet instruments of similar maturities or repricing frequencies.

Optionality Risk, arising from the options embedded in the assets and liabilities and off-balance sheet portfolios. An option may be embedded within a portfolio, e.g. loans that give borrowers the right to prepay balances and deposits that give the depositor the right to withdraw funds prior to final maturity without penalties.

How Cube³⁶⁰ measures Interest Rate Risk

The following standard IRR reports are available in Cube³⁶⁰:

- Gap report
- Cumulative gap report
- Interest sensitivity report
- Balance sheet sensitivity report
- Income statement sensitivity report
- Rate spread report

A myriad of stress testing facilities exist in Cube³⁶⁰ to provide information on the kinds of conditions under which the bank's strategies would be most vulnerable. Examples include:

- abrupt changes in the general level of interest rates,
- changes in the relationships among key market rates (i.e. basis risk),
- changes in the volatility of market rates.

By modelling different strategies, Cube³⁶⁰ will enable the IRR manager to minimize risk while maximizing earnings and net worth. This is done by means of measuring the projected earnings for different product mixes, with strategies such as:

- Buying and selling assets

- Changing liability structure and mix
- Introducing new products (assets and/or liabilities)
- Hedging

Cube³⁶⁰ will identify the appropriate strategy, which will depend on the current level of risk, the time frame, and the current interest rate environment, as a strategy for an expected increasing interest rate cycle will not be appropriate for a decreasing interest rate cycle.

How **Cube³⁶⁰** assists the Foreign Exchange Rate Risk (FXR) Manager

Foreign exchange ("FX") risk management may be defined as managing exposure to adverse exchange rate fluctuations within an acceptable range at an acceptable cost.

Cube³⁶⁰ allows the FXR manager to model an unlimited number of foreign exchange rate views. These can be defined for all of the currencies that the bank are currently trading in, as well as currencies which are considered for future trading.

As is the case with Interest Rate Risk modeling, the **Cube³⁶⁰** calculation engine will produce results for strategies based on any number of FX rate views to measure the effect of changes in exchange rates on future projected cash flows.

Cube³⁶⁰ allows the modeler to define each product in terms of a selected currency and thus reporting is done taking cognizance of current and future FX rates. This allows for reporting based on (current and projected future) cash flows as converted to the base currency. The user can specify currency conversions as direct (e.g. 1 ZAR = 0.1 EURO) or indirect (e.g. 1 USD = 6 ZAR).

In a multi-currency model, all reports (standard **Cube³⁶⁰** reports as well as user-defined reports) can be produced for 1 or more selected currencies only. This enables the FX Risk manager to analyze that portion of his portfolio (or the whole book) that pertains to 1 currency only, so as see the effect of perceived changes in FX rates on the cash flows (and future profitability of the bank).

Cube³⁶⁰ also caters for the following FX derivatives to measure their effectiveness in terms of hedging FX risk:

- FX swaps
- Forward Exchange contracts (FECs)

These deals can be specified as off-balance sheet items so as not to affect the future balance sheet projection reports.

Cube³⁶⁰ calculates (and reports on) swap costs and accumulated interest swap costs (for FX swaps) and premium costs (for FECs) are calculated.

To further assist the FX Risk manager in evaluating possible hedges, **Cube³⁶⁰** offers the facility to view each hedging contract in terms of:

For FX swaps:

- Capital swap cost
- Total cost
- Yield cost (as percentage of base currency)

For FEC's

- Transaction valued at spot rate
- Transaction valued at forecasted FX rate
- Profit/Loss

How **Cube³⁶⁰** measures Foreign Exchange Rate Risk

The effect of changes in future exchange rates (FX risk) is reflected on each of the standard risk reports in **Cube³⁶⁰**.

In addition, **Cube³⁶⁰** has a standard Hedge Effectiveness report, which shows:

- The repricing gap before and after derivatives
- The aggregate impact of derivatives
- The cumulative impact on Net Interest Income for rate shocks (up and down)
 - Including derivatives
 - Excluding derivatives

Benefits of **Cube³⁶⁰** for the Finance Department

Cube³⁶⁰ is effectively a management decision support system that will provide the Finance Department with the capability to do inter alia the following:

- Budgets
- Support Management Decisions
- Do What if scenarios
- Produce User Defined Reports
- Create Management Information
- Do Fair value calculations

How **Cube³⁶⁰** assists the Bank in doing Budgets

Cube³⁶⁰ allows its user to simulate an indefinite number of Balance Sheets, Income Statements, Cash flow statements and User Defined Reports into the future.

- The time frame used may vary from situation to situation, depending on the purpose of the simulation. For example, a five year time frame might be used if the simulation is done to calculate the future need for capital, whereas a six to twelve month time frame could be used to measure the impact of interest rate changes in the current financial year or eighteen months to be able to produce a budget for the next financial year.
- **Cube³⁶⁰** is an effective budgeting tool giving the user unlimited access to define various scenarios.
- Scenarios, comprising of a strategy, interest and exchange rate view can be set as a budget, called the original budget in the system. An additional revised budget can be created, which can be reset from any future month for a defined planning horizon.
- **Variance analysis**
Cube³⁶⁰ has the capability to do variance analysis based on interest bearing products comparing actual to an original budget, revised budget and any of the myriad scenarios the user has defined. To be able to do variance analysis **Cube³⁶⁰** accepts historical data for average balances, interest earned or paid per product defined.
Cube³⁶⁰ provides variances in terms of volume and price (rate).
- **Consolidations, business unit and portfolios**
Cube³⁶⁰ has a unique feature to merge simulations from different models, allowing consolidated models to use projections generated by source models. Consolidations can be very useful when budgets are created for various business units (branches) and portfolios. Due to the unique funding and investment algorithm of **Cube³⁶⁰**, models can also be created to determine short or long (open) positions per currency. Money can be transferred between models to fund short falls or the investment of surpluses.
All financial and risk reports are available per consolidated and sub models. Consolidated models contain the same level of details as their source (sub) models.
- **Fixed Assets**
All projected Capital Expenditure can be captured in **Cube³⁶⁰**. **Cube³⁶⁰** has the capability to define fixed asset classes, calculate depreciation and measure the impact of acquisitions and disposal as well as the timing thereof on the need for cash.
- **Non-interest items**
Cube³⁶⁰ caters for setting up rules for the calculation of fee and other income items as well as operational expenditure items.
Rules can be set up to calculate provisions and reserves.

- **Year to date figures**

Income statement items can be presented on a monthly and year to date basis, incorporating the actual figures for the current financial year. The YTD figures can be used for the following:

- to proportion operational expenses,
- to provide the base for growth in other income lines and
- to do YTD reporting

How **Cube³⁶⁰** assists in Management Decisions

- Funding of cash shortfall
- Investment of surplus cash
- Limit risk exposure
- Strategies/budgets into the future

The major advantage of using **Cube³⁶⁰** is the quantification of management decisions, for example, the volume of time (fixed) deposits by tenure required on a monthly basis or the new business (production) to be written on mortgages on a monthly basis.

How **Cube³⁶⁰** assists in “What if” scenarios

- Cube360 allows management to analyse the impact of any defined (internal) or external (interest and currency rates) factors on funding requirements, debt management and cash flow.
- Every “what if” can be defined as a scenario and be compared with a base case or another scenario.

How **Cube³⁶⁰** assists in defining User Defined Reports

- **Cube³⁶⁰** is an integrated system complying with general acceptable accounting principles. This allows the user to refer to any of the financial report lines and specific variables.

How **Cube³⁶⁰** assists in providing Management information

Cube³⁶⁰ has a vast number of standard reports except for the risk and financial reports covered above providing the following type of management information:

- **Rate spreads**

This reports provides interest rate returns and cost on a NACM basis, allowing the user to compare rates on a similar basis per currency

An example of how it can be applied is to divide Loans and Advances into Performing versus Non-

performing in order to obtain a net return position for Loans and Advances, highlighting the impact of defaulting.

- **Executive summary**

This report calculates the break even yield on assets in order to have a zero net interest margin. This report also provides the profit differential between interest bearing assets and liabilities.

- **Ratio Analysis**

Due to the facility to define user defined reports, there are no limitations to the number of ratios that can be expressed in **Cube³⁶⁰**. Common ratios include:

- Earning Assets/Total Assets
- Total Advances/Total Deposits
- Total Expenses/Total Income
- Return on Assets
- Return on Equity

- **Transfer Pricing**

Cube³⁶⁰ can do match funds transfer pricing (MFTP). MFTP refers to:

- the technique of analysing the interest rate margin broken down into asset margin, liability margin and mismatch margin.
- the process and methodology of establishing the cost of allocating funds within an organisation at rates internal to the organization.

How **Cube³⁶⁰** assists in doing Fair Value Calculations (IFRS 7)

Future cash flows of all instruments are “present valued” at a rate determined by a yield curve.

For a product with an indeterminate maturity date (such as “standard products”), the future flows are not considered. Instead, the product's capital (face value) is taken as the fair value.

Fair value calculations in **Cube³⁶⁰** are very much influence by the type of interest calculation that is set by the user. The setting of fair value calculations in **Cube³⁶⁰** is based on the selection of the mark-to market calculation:

Instrument Types

Within **Cube³⁶⁰** the following instrument types are specifically influence by this of type calculation being:

- YTM product type (Typical Bond calculation)
- Discount product type
- NCD type instrument where interest is payable at the end of the term

Benefits of **Cube³⁶⁰** for the Corporate & Institutional Department

In order to refrain from repeating most of the items listed above which could very well be used in the corporate and institutional department it might be worth highlighting some aspects such as:

- **Cube³⁶⁰** has a product type called pre-structured product flows which allows the user to construct a financial transaction using a spreadsheet to calculate loan repayments unique to a single deal incorporating capital outflows, interest accruals and paybacks.
- **Cube³⁶⁰** can be used to define production targets (new business) and the impact of different repayment schedules.
- Specific deals could be inserted to see impact on profitability and cash flow, allowing an indefinite number of “what if” scenarios.
- The corporate and institutional department can be modeled as a separate entity selling surplus funds to and borrowing funds from a central unit (treasury)

Why **Cube³⁶⁰** is the perfect budgeting tool

In essence, the budgeting process is the primary strategy for achieving the organization's objectives - be it growth, maximizing profit, achieving sales targets, or any combination thereof.

Underpinning the budgeting process is the production requirements for meeting the budget. It is essential that those who are responsible for managing production (sales) and controlling expenses, understand what the capital requirements are in order to “make the budget”.

A budget is said to be “out of date” as soon the first set of actual results become available. As such, it requires performance measuring on a regular basis and access to information such as:

- Are we on target to make the budgeted figures?
- What is the variance between the actual results & budget?
- What do we have to do to meet the budget target?
- What are the cashflow & liquidity constraints?
- What will be the effect of changes in external factors (e.g. changes in interest rates, foreign exchange, etc) on the budget?
- What will be the effect of credit impairments (or other forms of deterioration in asset quality on the targets?

Adjusting the budget is a reality. It is no use to ignore variances (between the actual results & budget/targeted), or to be unrealistic in believing that those variances will somehow disappear. Early warning signals should be recognized and strategies put in place to address the variances. Most importantly, senior management must be forewarned as soon as it becomes clear that targets may not be achieved.

Modern budgeting techniques make extensive use of modeling for the forward projection of the organization's Balance sheet, Income statement and Cashflow statement to see what the financial effects will be if the budget targets are reached. Best-practice models will allow the comparison of different strategies for reaching the targets and measuring the effectiveness of each planned strategy.

List of dynamic (projected) reports produced by **Cube³⁶⁰**

Financial Reports:

1. Balance Sheets
2. Income Statements
3. Cash flow Analysis
4. Treasury Report

Interest Rate Risk:

1. Gap
2. Cumulative Gap
3. Duration

Budgetary Reports:

1. Budget Comparison
2. Variance Report
3. Other Comparisons

Liquidity Risk:

1. Liquidity Need Report
2. Liquid Asset Composition Report
3. Capital Maturity

Valuation Reports:

1. Rate Spread
2. Match Fund Transfer Pricing
3. Fair Value
4. Net Present Value
5. Scenario Comparison

Management Reports:

1. Executive summary
2. Production Target Report

Stress Testing:

1. Balance Sheets Sensitivity
2. Income Statement Sensitivity
3. Price Sensitivity
4. Interest Sensitivity
5. MVPE

Contact
Contact Number

Email

Website <https://www.riskflow.com>

