

TEMENOS™

T-Risk Overview



TEMENOS™



T-Risk

“Basel II introduces a far more comprehensive framework for regulatory capital and Risk Management than we have ever known.”

Jaime Caruana, Chairman of the Basel Committee and Governor of the Bank of Spain

The Risk Management Imperative

Implementation of Basel II is seen as one of the banking sector's most significant risk management challenges ever.

There is a requirement for banks within the G10 countries to be live with a Risk solution by end of 2007, and over 120 additional countries are adopting a timetable from 2007-2010.

The Basel Committee's stated intention is to make the improvement of risk management a continuous process, but it is **mainly a key business differentiator**.

Regulatory Evolution

Regulatory evolution is the force that is driving risk management today:

Basel II – Pillar I

- ➔ Increased Sensitivity of Regulatory Capital.

Basel II – Pillar II & III

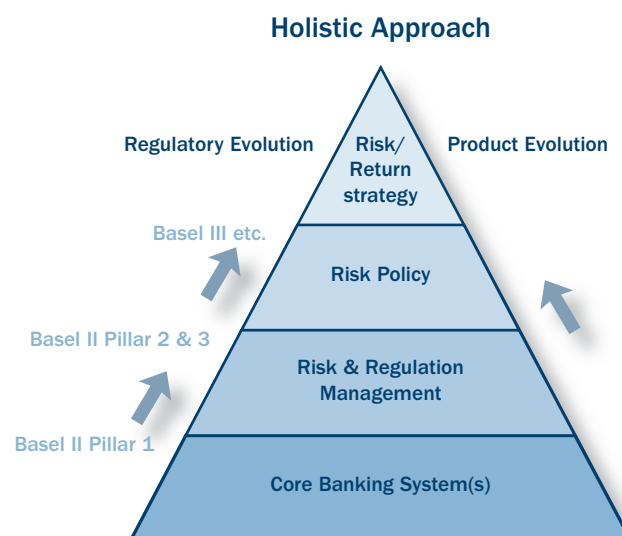
- ➔ Improved Risk Management Practice / Disclosure & Measurement of own Capital Requirement (ECONOMIC CAPITAL).

Basel III

- ➔ Bank managed on pure economic capital lines with strategic decision making based upon this.

T-Risk from TEMENOS enables you to:

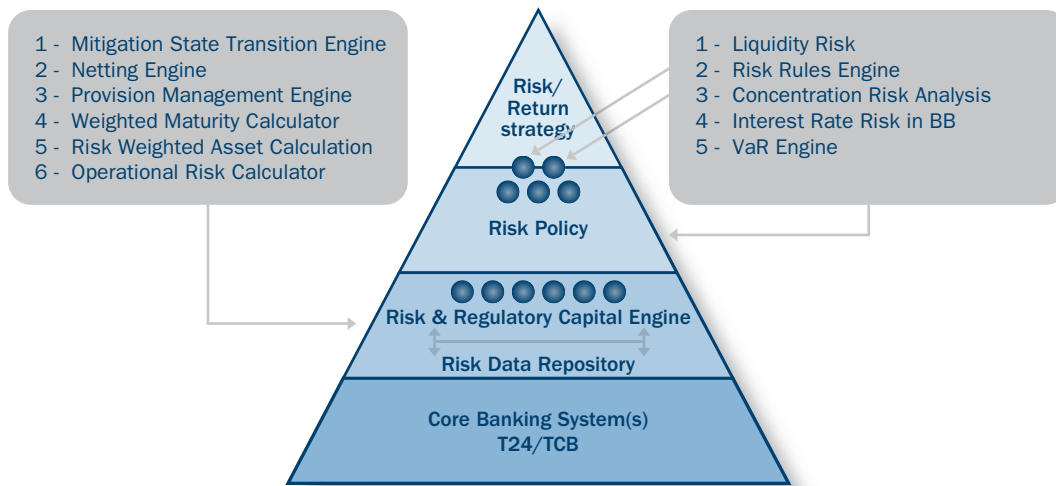
- Analyse the cost of capital by any business category.
- Recognise risk concentrations early.
- To provide the risk section of Management Dashboard.
- To optimise use of capital under Basel II rules.
- To ensure 'Best of Breed' Basel II Compliance.



Regulatory Evolution = Product Evolution to Achieve Leading Market Position

T-Risk

T-Risk Component Mapping



Risk Data Repository

The **Risk Data Repository** provides any Risk project with a significant advantage in that the following are clarified prior to work commencing:

- Basel II based risk data terminology giving a Basel II based data taxonomy B2ML.
- Open model for Credit, Market and Operational Risk:
 - ➔ Source Data
 - ➔ Reference Data
 - ➔ Results Data
- Implementation of the data class and attribute relationships within the T-Risk functionality, with availability for wider use by other risk applications.

Risk Data Repository and Data Integration

The rules based Data Transformation & Workflow component is used to translate data from feeder systems. It includes the following features:

- Definition of incoming message formats based upon data received from upstream operational systems.
- Definition of data transformation rules within T-Risk data repository.
- Execution of transformation rules.
- Published data interface message formats, pre-configured for integration with many systems, including TEMENOS GLOBUS™, TEMENOS T24™ (T24) and TEMENOS™ COREBANKING (TCB)

T-Risk

Regulatory Capital Engine – Coverage

The **Regulatory Capital Engine** covers:

- All Basel II Exposure Types:
 - ➔ Government
 - ➔ Bank
 - ➔ Corporate
 - ➔ Retail
 - ➔ Equity
 - ➔ Receivables
 - ➔ Securitisations
- All approaches and variants of these:
 - ➔ Standardised
 - ➔ IRBF
 - ➔ IRBA

Regulatory Capital Engine – Functional Components

The Regulatory Capital Engine includes the following components.

The **Mitigation State Transition Engine** offers a complete and granular mitigation solution including:

- Recognition of a 'layering' approach towards collateral, i.e. at transaction, facility and counterparty level – it should be noted that many banking exposures are mitigated by guarantees or collateral that are deal or facility specific and cannot be dealt with by a netting agreement approach.
- Application of mitigation against exposures strictly according to the legal structure, e.g. spare cash collateral which is available under an ISDA style agreement cannot be applied to reduce a lending exposure - If there is legally allowable mitigation available after all direct exposures have been mitigated T-Risk will optimise the application of the balance.
- Tracking and audit of the portion

and level of the exposure that is mitigated by each guarantee, credit derivative or collateral.

- Application of currency and maturity mismatch adjustments at the appropriate stage through the process.

The **Netting Engine** stores details of master netting agreements and applies point in time netting calculations to optimise the regulatory capital requirement. Examples of this are:

- ISDA Style
- IDNA Style
- Bilateral

The Risk Weighted Asset Calculation

Engine calculates regulatory capital per exposure for any or all of the Basel II approaches:

- For the Standardised Approach this includes E, E* and RWA.
- For the IRB Foundation Approach this includes EAD, E*, LGD*, R, K and RWA.
- For the IRB Advanced Approach this includes EAD, R, K and RWA.

The **Provision Management Engine**:

- Models and supports the capture of provisions.
- Takes account of the effect of provisions and write-offs in exposure calculations.
- Reports the adjusted capital requirement where appropriate.

The **Weighted Maturity Calculator**:

- Allows for the capture of cash flow schedules so that the value of Effective Maturity (M) may be calculated.

- If these cash flow schedules are not available, then a more conservative measure is calculated, based upon the nominal maturity of the exposure.
- Any defaults, specified by the supervisors, are incorporated within the T-Risk data model e.g. 2.5 years for the IRB Foundation Approach.

The Operational Risk Calculator

calculates the OR capital requirement, applying any or all of the Basel II Approaches.

- The Basic Indicator Approach
- The Standardised Approach

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Risk Policy Functional Components 1

Concentration Risk Analysis

T-Risk allows each counterparty to be assigned to a Concentration Risk Group – Concentration Risk Groups are groupings of Industry Sectors and Countries of Risk.

Each Concentration Risk Group can be influenced by one or more Concentration Risk Factors – examples of Concentration Risk Factors are:

- Increase in oil prices
- Political change in a country

For each Concentration Risk Factor a series of scenarios may be defined and in turn each of these scenarios will define a number of quantitative impacts e.g. Basis point shifts to the PD curve, or internal rating down grades.

Using the relationship between the Concentration Risk Groups and the Concentration Risk Factors, T-Risk is able to construct the scenarios which show the capital impact upon the particular segment of the portfolio. For example:

➡ Impact of an oil price decrease of 10% on the Trade Finance Business to Russian Oil companies, leading to a 10 basis point downward shift to the PD curve for all counterparties with an industrial sector of oil and a country domicile of Russia.

➡ Re-scheduling of a country's debt leading to 50 basis point shift of the PD curve for all counterparties domiciled in that country.

Interest Rate Risk in the Banking Book

The estimation of this is a requirement for all banks, including those that adopt the Standardised Approach.

For banks adopting Standardised Approach T-Risk provides the following features:

- Summation of cash flows into forward maturity buckets.
- Application of parallel shifts to the yield curve (based upon the number of basis points specified by the regulator – currently 200 for the UK) to calculate the value of 'shocking the yield curve'.
- Covariance based approach to the calculation of the VaR – this assumes linearity in the portfolio.
- A simulation based approach is available for no-linear portfolios.

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Risk Policy Functional Components 2

Liquidity Risk

The estimation of this is a requirement for all banks, including those that adopt the Standardised Approach.

For banks adopting Standardised Approach T-Risk provides the following features:

- Construction of the forward cash flow schedule.
- Recognition of asset and liability cash flow mismatches.
- Scenario analysis.
- ➔ Parameterised time adjustment of future cash flows.
- ➔ Interest rate shifts to future cash flows.
- ➔ Volatility shifts for currency spreads.

VaR Engine

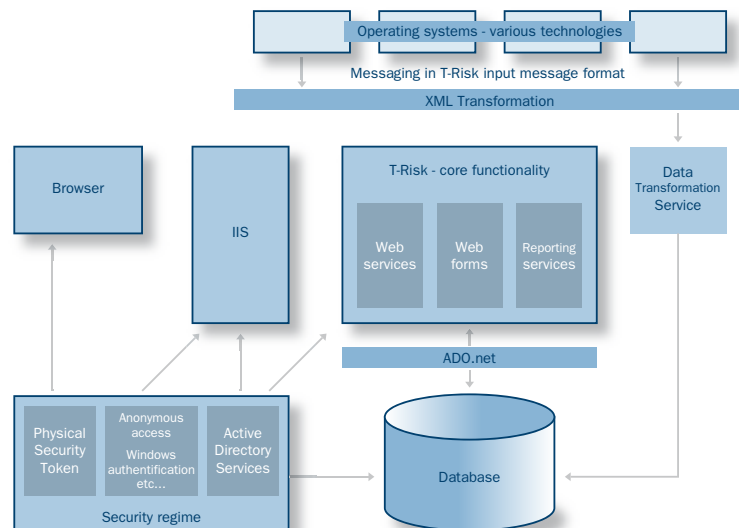
Covariance based VaR may be applied at a portfolio level or shown as an incremental change, deal by deal against VaR limits.

Portfolio based VaR deconstructs the portfolio into a series of forward bucketed cash flows, using the appropriate cash flow generation methodology by instrument type. These cash flows are mapped using sophisticated algorithms, to the appropriate curve vertices. Volatility factors and correlation matrices are sourced from market recognised publishers. The appropriate matrix math is utilised to calculate the portfolio based VaR figures, using parameterised holding period and confidence factor variables. Monte Carlo simulation is also available.

Risk Rules Engine

This allows the definition of rules using a browser based rule builder. The rules allow access to the Metadata which supports the B2ML taxonomy. Rules may be tested post construction. Nested rules may be defined because defined rules become Meta rules. In a production environment the rules may be executed at point of transaction entry or in batch mode. Rules may be applied for a wide variety of business reasons:


- Compliance
- Internal credit controls
- VaR limits
- Trading management
- Etc...



TEMENOS Headquarters SA
18 Place des Philosophes
CH-1205 Geneva
Switzerland

Tel:+41 22 708 1150
Fax:+41 22 708 1160

To find out more about a TEMENOS office near you, please visit
www.temenos.com

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