

R³S Standard Code

Simplifying the complexity of actuarial, regulatory
and risk-based implementations.



Experts in sophisticated
actuarial models and
advanced modeling
software.



R³S Modeler Standard Code

Whether starting out with a new software system, developing and pricing new products for launch or implementing new regulations, building accurate and realistic models as quickly as possible is a common requirement. To help facilitate this process, there is an extensive library of standard code installed with R³S Modeler for a wide range of assets, liabilities and processes.

What is Standard Code in R³S Modeler?

To complement the modular design of R³S Modeler, the standard code is primarily a collection of modules known as building blocks. These are relevant to most markets and can be fitted together to form assets, liabilities, products and calculation routines.

Designed to ensure that the code is fully modular and extremely flexible, the building blocks are collections of common calculation routines, such as probability calculations, that interact with one another seamlessly and without additional coding when used in a suitable combination. They are written using expert local knowledge. Users can easily create new programs to fit the specific requirements of a company by bringing together the relevant building blocks.

The consistency provided by the shared building blocks enables multinational users to report across all offices in a standardized manner and enables the models of different business units to share the same code base. This is a key advantage in international projects and for risk management, as well as for smaller companies wanting consistent model code across all functions.

What can Standard Code do?

The Standard Code contains the building blocks to fully model the following:

Products

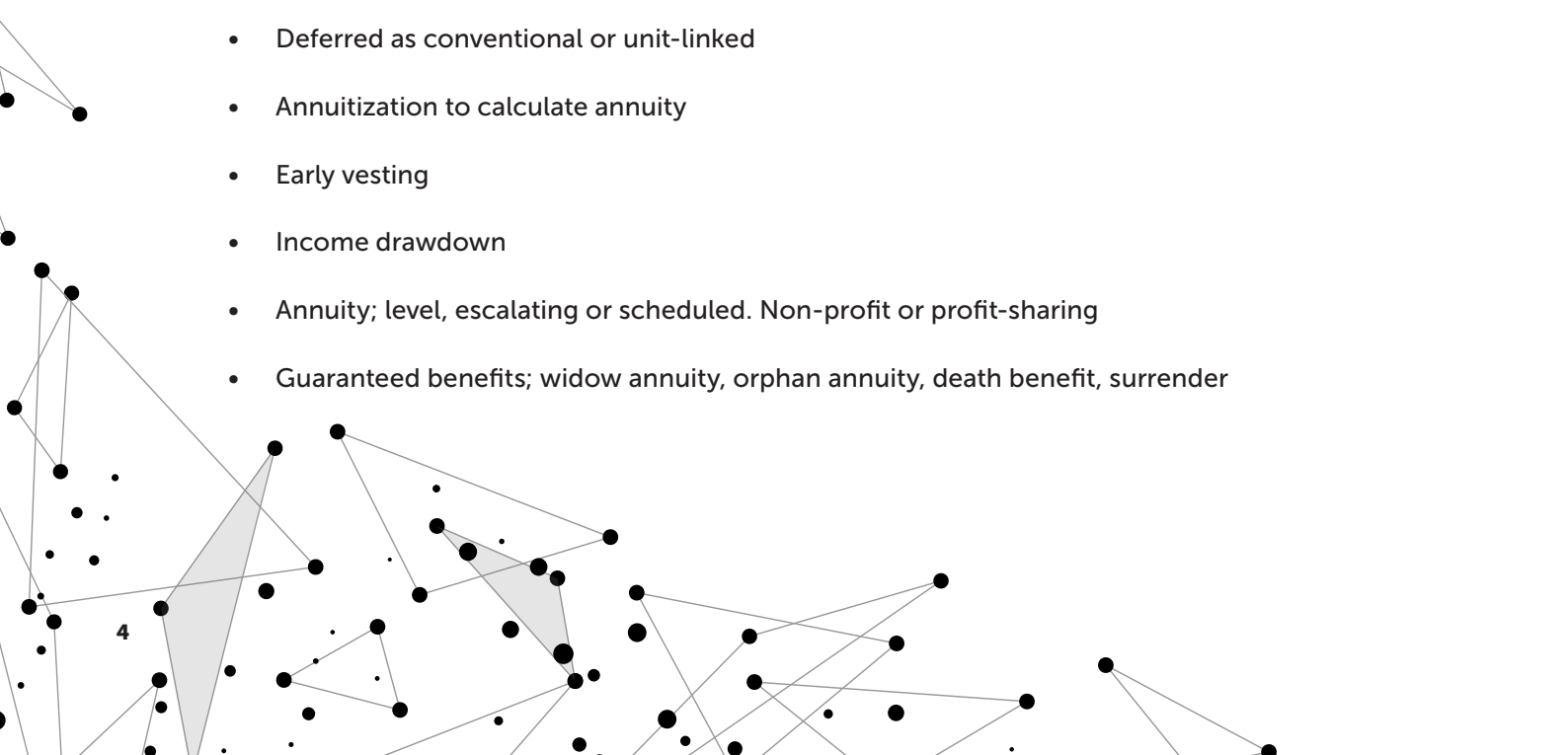
Conventional / Traditional Products

- Endowment, term and whole life insurance, including anticipated or scheduled benefits
- Profit sharing, such as reversionary, revalorization, and cash terms

Unit linked Products

- Unit growth and deduction of charges
- Including capital units and multiple funds
- Unitized with-profits

Annuity Products

- Deferred as conventional or unit-linked
 - Annuitization to calculate annuity
 - Early vesting
 - Income drawdown
 - Annuity; level, escalating or scheduled. Non-profit or profit-sharing
 - Guaranteed benefits; widow annuity, orphan annuity, death benefit, surrender
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Healthcare or Income Protection Products

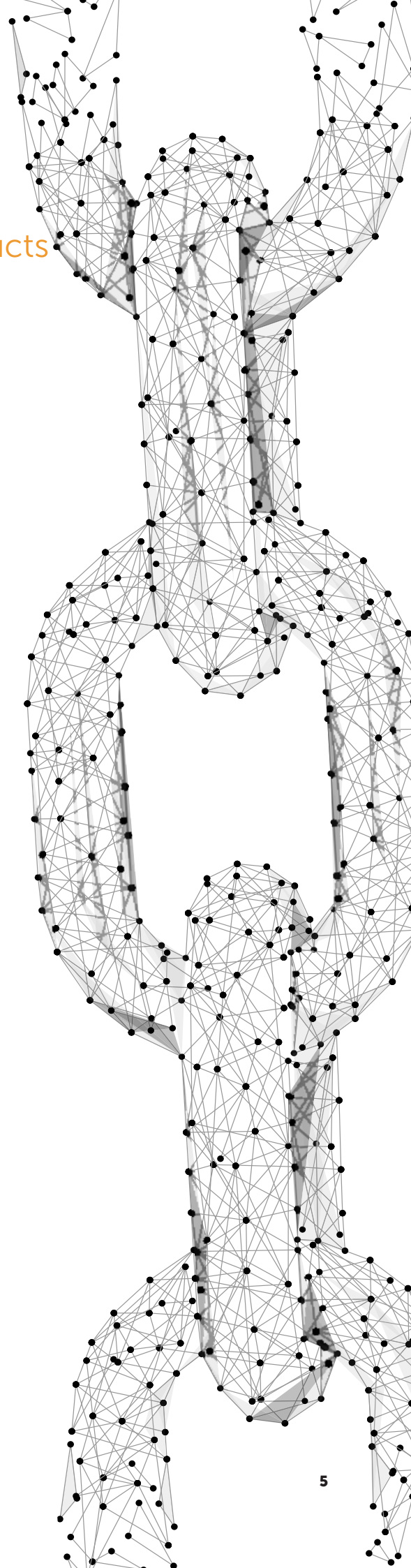
- Multi-state Markov model
- Healthy or sick states; sick states varying by duration sick
- Benefits dependent on duration sick
- Recovery and mortality decrements
- French prevoyance

Bulk Purchase Annuities Products

- Bulk purchase annuity scheme model including regulatory and scheme parameters
- Benefit escalation
- Guaranteed minimum pension
- Spouse benefits
- Franking
- Tax free cash calculation; using commutation functions or factor lookup

Reinsurance

- Risk premium
- Original terms (proportional)



Variants

- Single life, joint life first death, joint life second death/last survivor
- Variable premiums and benefits
- Rider benefits, including waiver of premium and accidental death
- Critical illness and accelerated critical illness
- Future paid-up policies by annual cohort
- Annuitant mortality improvements
- Stochastic mortality
- Stochastic healthcare sickness and recovery rates

US Style Account Value Products

- General account premium accumulation less charges
- Multiple separate accounts for variable products
- Investment segment tracking by premium for indexation products with complex guarantees
- Range of cost of insurance and rider benefit options
- Fixed deferred annuity; fixed indexed annuity (with or without rider), variable annuity (with riders), universal life and indexed universal life (with and without no-lapse guarantee)

Processes or calculation routines

Realistic

- Present Value of Future Profits (PVFP) and Present Value of Future Shareholder Transfers (PVFST) and embedded value
- Asset share, including retrospective and projected; charge or expense basis for unitised with-profits
- Cost of smoothing, cost of guarantees and asset share subsidy calculations for with profit realistic reporting
- Cost of guaranteed annuity options
- Asset Liability Management (ALM), such as deterministic, scenarios, and stochastic
- Model Point Generation
- Allowance for the effects of:
 - Solvency margin
 - Rentestandskorting (RSK)
 - Tax on multiple bases
 - Deferred Acquisition Cost (DAC)
 - Risk Margin, Residual Margin (including China GAAP)
 - Consistency with Solvency II Standard Formula Standard Code Add-on
 - IFRS 17 reporting

Reserving

- Net premium or level and modified, including Zillmer, Full Preliminary Term (FPT) and Commissioners Reserve Value Modification (CRVM)
- Gross premium
- Inventory premium
- Expense reserves
- Unearned premium reserves, deferred premium reserves
- Non-unit reserves, including sterling reserves
- French Solvency I requirements
- Variants
 - Level and variable benefit commutation functions
 - Cash flow reserving
 - Calendar year and policy anniversary calculations
 - Split reserves

US Reporting

- Statutory reserve / capital code:
 - FA's: AG33 CARVM reserving and AG35 (UMV) for indexed annuities
 - VA's: AG43 VACARVM and C3 phase II for capital
 - UL: CRVM for reserving, plus AG36 for indexed universal life and AG38 for no lapse guarantee
- GAAP Reporting
 - FAs: FAS 97 and FAS 91 (for regular FAs), and FAS 133 (for indexed annuities) with SOP 03-01 (for rider)
 - VAs: FAS 133 (for GMAB, GMMB and GLWB riders), SOP 03-01 (for GMDB, GMIB and GMWB riders), FAS 97 (for others)
 - UL: FAS 133 (for indexation credits), SOP 03-01 (for NLG and GMDB rider), FAS 97 (for other)

Assets

Types

- Equity, including normal and preference shares
- Bonds, such as government, corporate, linked, zero coupon and convertible property
- Derivatives
 - Interest rate swaps
 - Put and call equity options, including European and American
 - Collateralized Mortgage Obligations (CMOs) and Collateralized Debt Obligations (CDOs)
 - Equity index futures
 - Forward rate agreements
 - Swaps and swaptions

Reporting

- Book values: Purchase and Amortized
- Market values: Closed form, discounted lattice, projected
- Dynamic portfolio rebalancing, into new or existing assets

Included with the building blocks are many example programs and models that demonstrate how the various modules can work together and be used for various applications, as well as a tool to recommend the building blocks to use based on selected model requirements.

Highlights

- Library of building blocks to allow rapid code development
- Includes many assets, liabilities and regulatory processes
- Easy to use, flexible and customizable
- Reusable to create shared code for all models
- Build each product or process once and reuse the same code elsewhere



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