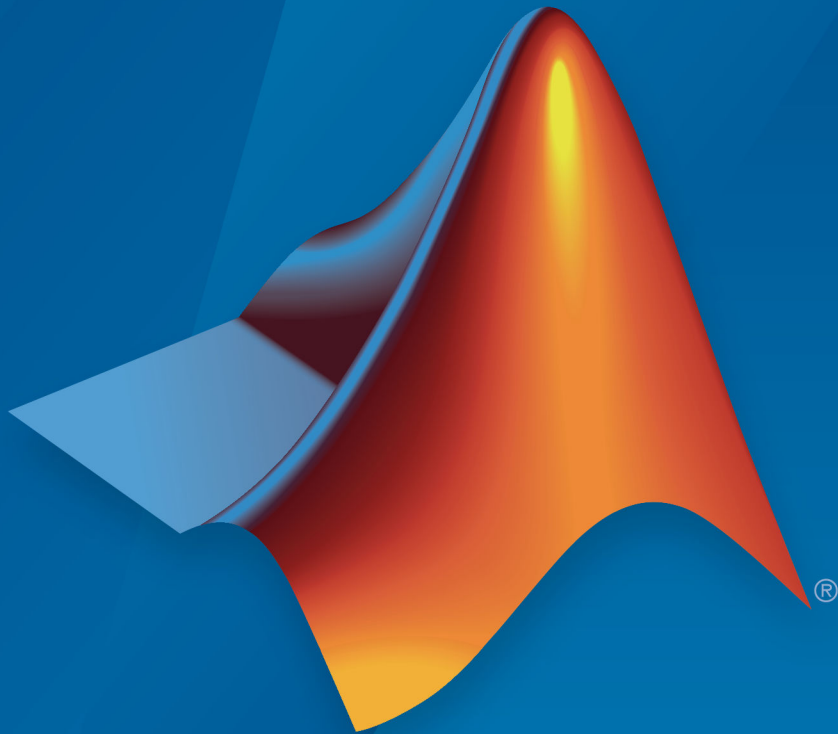


# Risk Management Toolbox™ Release Notes



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## *Risk Management Toolbox™ Release Notes*

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# R2019b

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**Version: 1.6**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **Market Risk: Backtest expected shortfall (ES) models using Du and Escanciano tests**

The following new functions provide support for performing expected shortfall (ES) backtests by Du and Escanciano:

- `esbacktestbyde`
- `summary`
- `runtests`
- `unconditionalDE`
- `conditionalDE`
- `simulate`

New examples demonstrating workflows using expected shortfall (ES) backtests by Du and Escanciano:

- “Workflow for Expected Shortfall (ES) Backtesting by Du and Escanciano”
- “Rolling Windows and Multiple Models for Expected Shortfall (ES) Backtesting by Du and Escanciano”

## **Consumer Credit Risk: Validation of compact credit scorecards using `validatemodel`**

Work with compact credit scorecards using the `compactCreditScorecard` class and then use `validatemodel` to validate a compact credit scorecard.

## **Credit Scorecard: Example comparing credit score using logistic regression and decision trees**

A new example compares credit score values using logistic regression and decision trees (“Comparison of Credit Scoring Using Logistic Regression and Decision Trees”).



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## **Credit Scorecard: Example using reject inference to incorporate credit rejection data into creditscorecard workflow**

A new example demonstrates two approaches for using reject inference techniques to incorporate credit rejection data as part of the `creditscorecard` modeling workflow (“Use Reject Inference Techniques with Credit Scorecards”).

## **Consumer Credit Risk: Example comparing probability of default using through-the-cycle and point-in-time models**

A new example compares the probability of default using through-the-cycle (TTC) and point-in-time (PIT) models (“Comparison of Probability of Default Using Through-the-Cycle and Point-in-Time Models”).

## **Consumer Credit Risk: Example fitting different types of models to loss given default (LGD) data**

A new example demonstrates fitting different types of models to loss given default (LGD) data (“Model Loss Given Default”).

## **Calculation of p-value for bin has changed**

In R2019a and previous releases, the binomial VaR backtest reports the tail probability as the  $p$ -value and compares the reported  $p$ -value to half of the  $alpha$  (`1 - TestLevel`) of the bin test.

In R2019b, the binomial VaR backtest `bin` calculates the  $p$ -value contained in the `TestResults` output using the  $2 * \text{tail}$  probability convention and the  $p$ -value can be compared to  $alpha$ . For more information, see “Algorithms”.



# R2019a

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**Version: 1.5**

**New Features**

**Bug Fixes**

## **Consumer Credit Risk: Predictor screening for credit scorecards**

Perform predictor screening for credit scorecards using the `screenpredictors` function. For more information, see [Feature Screening with screenpredictors](#).

## **Consumer Credit Risk: Support for compact credit scorecards for easier deployment and reduced memory usage**

Work with compact credit scorecards using the `compactCreditScorecard` class along with associated functions for `displaypoints`, `score`, and `probdefault`. In addition, you can create a compact credit scorecard by using the `compact` function from Financial Toolbox™ with a `creditscorecard` object. For more information, see [compactCreditScorecard Object Workflow](#) and [Validate the Quality of a Compact Credit Scorecard Model](#).

# R2018b

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**Version: 1.4**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **Binning Explorer: Bin data automatically using merge and split algorithms**

The Binning Explorer app supports the merge and split algorithms. For more information, see **Binning Explorer**.

## **Binning Explorer: Bin missing data in a separate bin**

The **Binning Explorer** app supports binning missing data for a predictor in a separate `<missing>` bin. For more information, see **Binning Explorer**.

## **Binning Explorer: Load data from the command line**

The Binning Explorer app supports loading data or a `creditscorecard` object from the command line. For more information, see **Binning Explorer**.

## **Corporate Credit Risk: Perform parallel simulations using `creditDefaultCopula` and `creditMigrationCopula`**

The `creditDefaultCopula` and `creditMigrationCopula` classes support the `'UseParallel'` property for parallel simulations when using the `simulate` and `riskContributions` functions. You can set the `'UseParallel'` property when creating `creditDefaultCopula` or `creditMigrationCopula` objects only if you have Parallel Computing Toolbox™.

## **`creditCopula` object removed**

The `creditCopula` object is removed.

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## Compatibility Considerations

Object Name	What Happens When You Use It	Use This Instead	Compatibility Considerations
creditCopula	Removed	creditDefaultCopula	Replace all instances of creditCopula object with a creditDefaultCopula object using creditDefaultCopula.





# R2018a

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**Version: 1.3**

**New Features**

**Bug Fixes**

## **Corporate Credit Risk: Calculate standard deviation and value-at-risk contributions for each counterparty in a credit portfolio**

The `riskContribution` function for `creditDefaultCopula` and the `riskContribution` function for `creditMigrationCopula` support returned information for counterparty contributions for standard deviation of the losses (`Std`) and value at risk (`VaR`) at the threshold `VaRLevel`.

# R2017b

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**Version: 1.2**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **Corporate Credit Risk: Compute regulatory capital and value-at-risk using an asymptotic single risk factor (ASRF) model**

The `asrf` function provides an ASRF model for credit risk analysis. `asrf` accepts the risk characteristics of a portfolio of credit-sensitive instruments as input and computes the necessary capital using an ASRF model.

## **Corporate Credit Risk: Perform credit portfolio simulation with random loss given default (LGD)**

Support is provided for specifying random LGD (loss given default) for `creditDefaultCopula` and `creditMigrationCopula` objects. You can now specify the LGD input argument as a `NumCounterparties-by-2` matrix, where the first column contains the LGD mean values and the second column contains the LGD standard deviations. In this case, LGD values are drawn randomly from a beta distribution with the parameters provided for the defaulting counterparty.

## **Market Risk: Backtest expected shortfall models**

The following tools support expected shortfall (ES) backtesting for table-based tests for the unconditional Acerbi-Szekely test.

- `esbacktest`
- `summary`
- `runtests`
- `unconditionalNormal`
- `unconditionalT`

The following tools support expected shortfall (ES) backtesting for distribution tests for normal and `t` distributions.

- `esbacktestbysim`
- `summary`
- `runtests`
- `conditional`
- `unconditional`

- quantile
- simulate

## Consumer Credit Risk: Specify weights in credit scorecards using Binning Explorer

Specify weights in a credit scorecard when using the Binning Explorer app. For more information on defining weights for a `creditscorecard` object, see the optional name-value pair argument `WeightsVar` for `creditscorecard`.

### creditCopula object renamed

The `creditCopula` object is renamed to the `creditDefaultCopula` object.

### Compatibility Considerations

Object Name	What Happens When You Use This Object	Use This Object Instead	Compatibility Considerations
<code>creditCopula</code>	Errors	<code>creditDefaultCopula</code>	<p>Replace all instances of <code>creditCopula</code> object with <code>creditDefaultCopula</code> object using <code>creditDefaultCopula</code>.</p> <hr/> <p><b>Note</b> The <code>CounterpartyLosses</code> property of the <code>creditCopula</code> object is removed in the <code>creditDefaultCopula</code> object. To obtain counterparty losses, use the <code>getScenarios</code> function.</p>



# R2017a

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**Version: 2.5**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **Corporate Credit Risk: Estimate the probability of credit rating migration based on multifactor copula model**

The following tools support corporate credit portfolio analysis for credit migration simulation using a `creditMigrationCopula` object for copula-based simulations:

- `creditMigrationCopula`
- `simulate`
- `portfolioRisk`
- `riskContribution`
- `confidenceBands`
- `getScenarios`

## **Corporate Credit Risk: Quantify credit concentration risk by Herfindahl index and other concentration measures**

The `concentrationIndices` function supports the following concentration indices:

- CR — Concentration ratio
- Deciles — Deciles of the portfolio weights distribution
- Gini — Gini coefficient
- HH — Herfindahl-Hirschman index
- HK — Hannah-Kay index
- HT — Hall-Tideman index
- TE — Theil entropy index

## **Corporate Credit Risk: Model corporate default risk using Merton model**

The `mertonmodel` and `mertonByTimeSeries` functions estimate the default probability using Merton's model.

## **creditCopula object renamed**

The `creditCopula` object is renamed to the `creditDefaultCopula` object.



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## Compatibility Considerations

Object Name	What Happens When You Use This Object	Use This Object Instead	Compatibility Considerations
creditCopula	Warns	creditDefaultCopula	<p>Replace all instances of creditCopula object with creditDefaultCopula object using the creditDefaultCopula constructor.</p> <hr/> <p><b>Note</b> The CounterpartyLosses property of creditCopula object is removed in the creditDefaultCopula object. To obtain counterparty losses, use the getScenarios function.</p>



# R2016b

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**Version: 2.4**

**New Features**

## Consumer Credit Risk: Binning Explorer for Credit Scorecards

**Binning Explorer** is an app for developing and modifying binning assignments for a `creditscorecard` object. For more information, see [Binning Explorer](#).

## Corporate Credit Risk: Copula-based simulation framework

The following tools support corporate credit portfolio analysis using a `creditCopula` object for copula-based simulations:

- `creditCopula` — Creates a `creditCopula` object.
- `simulate` — Simulates credit defaults using a `creditCopula` object.
- `portfolioRisk` — Generates portfolio-level risk measurements for a `creditCopula` object.
- `confidenceBands` — Generates confidence interval bands for a `creditCopula` object.
- `riskContribution` — Generates risk contributions for each counterparty in the `creditCopula` object.

## Market Risk: Value-at-Risk Backtesting Tools

Value-at-risk (VaR) is an important measure of financial risk. VaR is an estimate of how much value a portfolio can lose in a given time period with a given confidence level. VaR backtesting tools assess the accuracy of VaR models. The following VaR backtesting tools are supported:

- `varbacktest` — Creates a `varbacktest` object using portfolio outcomes data and corresponding value-at-risk (VaR) data.
- `bin` — Binomial test.
- `cc` — Christoffersen's conditional coverage mixed test.
- `cci` — Christoffersen's conditional coverage independence test.
- `pof` — Kupiec's proportion of failures test.
- `tbfi` — Haas's time between exceptions independence test.
- `tbfi` — Haas's mixed time between exceptions (independence and frequency) test.
- `tl` — Traffic light test.

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- `tuff` — Kupiec's time until the first failure test.
  - `summary` — Summary report on the given `varbacktest` data.
  - `runtests` — Runs all tests and reports the final test results.

