

Backtesting Derivative Portfolios with Filtered Historical Simulation (FHS)

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Abstract

Filtered historical simulation provides the general framework to our backtests of portfolios of derivative securities held by a large sample of financial institutions. We allow for stochastic volatility and exchange rates. Correlations are preserved implicitly by our simulation procedure. Options are repriced at each node. Overall results support the adequacy of our framework, but our VaR numbers are too high for swap portfolios at long horizons and too low for options and futures portfolios at short horizons.

Keywords: *Value-at-risk; historical simulation; GARCH.*

JEL classification: G19

1. Introduction

We backtest a large sample of LIFFE derivative portfolios held by financial institutions. Our backtests are based on a new generation of value-at-risk (VaR) models, filtered historical simulation (FHS). FHS overcomes some shortcomings of the traditional bootstrapping approach.

Historical simulation (bootstrapping) consists of generating scenarios, based on historical price changes, for all the variables in the portfolio. Since the estimated VaR is based on the empirical distribution of asset returns it reflects a more realistic picture of the portfolio's risk. Unfortunately this methodology presents a number of

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