

DIRECTED RISK RESEARCH PROBLEM STATEMENT

Risk Theme	Risk Analysis	Problem Nr.	PS16020		
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PROJECT TITLE: Stochastic Process for simulation of Managed Currencies

PROJECT GOAL

To propose stochastic process that can be used in Monte Carlo simulation of managed currencies.

HIGH LEVEL DESCRIPTION OF PROBLEM

The standard market practice for simulation of foreign exchange rates is to use Geometric Brownian Motion (GBM) with the drift rate equal to the interest rate differential. This is a reasonable approximation for free-floating currency pairs. For currencies that are managed, a different modelling approach is required.

Managed currencies can be broadly classified into three main regimes

1. Pegged – the exchange rate is fixed
2. Managed Peg - the exchange rate is managed between very tight bands
3. Managed Float – the management of the currency is dependent on economic conditions at the time; the trading bands are not pre-determined.

History has shown that managed currency do not always trade within the desired bands; that is pegs tend to break. The peg-break can happen during an economic crisis or deliberate devaluation of a currency. This makes the modelling of these currencies non-trivial as some sort of jump process is required to better represent their behaviour.

PROJECT OBJECTIVES

The objectives of this project are:

- Define stochastic process for simulation of managed currency for different regimes
- Also propose calibration methodology for the model
- Some backtesting of the model for major peg-breaks

OUTPUTS REQUIRED

- Research paper(s) discussing approach followed to come up with stochastic process and calibration process as well as backtesting results

STRATEGIC VALUE TO DIRECTED RISK RESEARCH

This research will contribute in better risk management for derivatives traded on managed currencies