Technical Specification

**Portfolio Optimisation**

**2015**

**Revisions**

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# Introduction

The document describes the mathematical modelling towards portfolio optimisation. The maximised function requires three conditions that will be described in detail

# Specification

## Overview

The optimisation process requires that to maximise the following cost function

where



*ui* : number of units of the *i*th trade (*i =* 1,2,…,*N*)

*Pi* : expected profit of the *i*th trade

*DFi*: discount factor of the *i*th trade

under the following constraints

## Condition 1



## Condition 2



## Condition 3

Run a simulation of potential joint default events using a new fixed correlation matrix and a Gaussian copula. Calculate the most probable joint default scenarios and their respective probability.

For each scenario *k* of joint default events, calculate the maximum loss *Lk* as a sum of the maximum losses of the individual trades that constitute the particular scenario *k* . Sort all *Lk* in descending order. Take the first *n* scenarios for which



and optimise cost function such as

