Suade RegTech Exercise

2017-01-17

Introduction

This little coding challenge is an example of the kind of work we would expect from you at Suade. The goals of this exercise are to get a better understanding of your:

- Proficiency with programming in python, json and data handling
- How you "document" your code (ie. can someone else understand it)
- How you "test" your code (ie. make sure it does what you think it does)
- Understanding of financial terms and concepts
- Approach and creativity to solving open-ended problems

The Task

The task is to get a rough understanding of the objectives of the Basel Committee's Standardised Approach to Counterparty Credit Risk and implement a calculator in Python for some types of trades. There are two aspects, one regulatory and one technical.

Reg

Question 1: In 200 words or less, explain what you think the Basel Committee is trying to achieve with this regulation, pros/cons of this approach and what (if any) is the alternative?

Question 2: In 100 words or less, explain, as you would to your grandmother, what the *Add-On* is for?

Tech

For the scope of this exercise we limit implementation to only Interest Rate Swaps and Swaptions for which you will find an example calculation on page 22 (Example 1). You may assume the netting set is not subject to a margin agreement and there is no exchange of collateral (independent amount/initial margin) at inception.

Your code should accept as an input a "netting set" of derivatives data as a JSON file (*.json*) of data that conforms to the derivatives.json schema of the FIRE Data Format and return as an output the Exposure of Default (EAD). Feel free to browse the FIRE Github repo where you will also find further documention/defintiions for the data elements. There is some sample data below (NB. You should not need any further attributes than the ones provided below).

Please also provide a README.md with instructions on how to run the code and any unit tests.

We estimate that this should take 2-3 hours of work depending on how engaged you are. If you find the experience tiresome and realise you are not interested in RegTech, then that's great and we both know that this position is not for you and you shouldn't waste any more of your time.

Please send your response to jobs@suade.org and we will try to come back to you within a few days.

Thank you!

Sample Data


```
{
  "name": "Derivatives Data",
  "date": "2017-01-17T00:00:00Z",
  "data": [
    {
      "id": "swap_1",
      "date": "2017-01-17T00:00:00Z",
      "asset_class": "ir",
      "currency_code": "USD",
      "end_date": "2019-01-17T00:00:00Z",
      "mtm_dirty": -1500,
      "notional_amount": 10000,
      "payment_type": "fixed",
      "receive_type": "floating",
      "start_date": "2017-01-10T00:00:00Z",
      "type": "vanilla_swap",
      "trade_date": "2017-01-10T00:00:00Z",
      "value_date": "2017-01-16T00:00:00Z"
    },
    {
      "id": "swap_2",
      "date": "2017-01-17T00:00:00Z",
      "asset_class": "ir",
      "currency_code": "GBP",
      "end_date": "2019-01-17T00:00:00Z",
      "mtm_dirty": 1400,
      "notional_amount": 10500,
      "payment_type": "floating",
      "receive_type": "floating",
      "start_date": "2017-01-10T00:00:00Z",
      "type": "vanilla_swap",
      "trade_date": "2017-01-10T00:00:00Z",
      "value_date": "2017-01-16T00:00:00Z"
    }
  ]
}
```