

User Guide

on online testing of the Financial Instruments Pricing Model

1. PRELIMINARIES

This Guide is aimed to instruct the user who wishes to perform independent testing of the Financial Instruments Pricing Model developed by Sceptica Scientific Ltd.

The current version of the model allows predicting the *direction* of the future price change subject to the known previous price movement. The ability to forecast the *value* of the future price change alongside with the direction is not yet implemented.

We shall be grateful to you for any feedback concerning your tests of our model.

2. MAIN

You can perform tests with any financial instruments of your choice. The input data have to be uploaded by clicking the “Browse” button and choosing a plain text file containing a column vector of integers, representing (nonzero) quote changes over a period of time. For example, for the price series $\{x_i\}$

1.45, 1.47, 1.44, 1.44, 1.42, 1.37, 1.34, 1.35, 1.39, 1.42, 1.42

the vector of integer price changes $\{\Delta x_i\}$ is

+2
-3
0
-2
-5
-3
+1
+4
+3
0

To prevent the model from knowing future price changes and thus exclude any fraud, you can also downsample this vector by omitting every second entry. E.g., for the data shown above downsampling would yield the following data to upload

+2
0
-5
+1
+3

Therefore, each entry of the input data is a price change Δx_{prev} , for which the direction of the next price change Δx_{next} (unknown to the model due to downsampling) is to be forecast.

To run a test, click the “Forecast” button.

When the test is done, the output plain text file will be available for download. The output contains a vector of +1's and -1's, indicating the predicted directions of the future quote changes. E.g., for the above shown data it may contain

+1
NaN
-1
+1
-1

In order to estimate the accuracy of the forecast, the output has to be compared with the control data – the price changes Δx_{next} that took place in reality. Those were eliminated due to downsampling, and in our example they are

-3
-2
-3
+4
0

The comparison is summarised in the table below.

Δx_{prev}	Δx_{next}	forecast	right/wrong
+2	-3	+1	wrong
0	-2	NaN	N/A
-5	-3	-1	right
+1	+4	+1	right
+3	0	-1	semi-right

The first prediction, (+2, -3), is wrong, because the real next price change is negative, whereas the forecast's is positive. The second prediction, (0, -2), is undefined, since nil input entries are currently ignored. The third and fourth predictions are right, as the predicted and the real changes' directions coincide. Finally, the fifth result is semi-right semi-wrong (or uncertain), because the real next price change is zero. The relative frequency of success is therefore 2 right trials plus 1 semi-right (uncertain) trial of 5 total trials minus 1 ignored trial, i.e. $(2 * 1.0 + 1 * 0.5) / (5 - 1) = 0.625$, or 62.5%.

3. TECHNICAL NOTES

Due to the website's technical restrictions, the model is mainly to be verified on low time frames (up to the tick level). High time frames' quotes can be uploaded as well,

although the corresponding forecast may be of poor accuracy. Anyway, please try to fulfil the following conditions:

- the input sample contains several tens of thousands of nonzero entries, and
- the majority of the entries do not exceed 100 in the absolute value.