

Price response functions and spread impact in foreign exchange markets

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Received: date / Revised version: date

Abstract To be done

PACS. 89.65.Gh Econophysics – 89.75.-k Complex systems – 05.10.Gg Statistical physics

1 Introduction

Basic description:

The term “pip” is commonly used in the foreign exchange market in place of the word ‘tick’. Pips arise as a matter of convention. A pip refers to the incremental value in the fifth non-zero digit position from the left. Note that it is not related to the position of the decimal point. For example, one pip in a USD/JPY value of 113.57 would be 0.01, while one pip for EUR/USD of 1.0434 would be 0.0001 [4].

Previous works (general):

In [4] they found that smaller volumes cause larger bid-ask spreads for technical reasons to do with measurement, whereas in [2, 3] claim that larger bid-ask spreads caused smaller volumes due to trader behavior.

In [1], they found the spreads to be between two and four times larger for emerging market currencies than for developed country currencies.

Previous works (specific):

Explanation of our work:

Paper distribution:

The paper is organized as follows: in Sect. 2 we present our data set of foreign exchange pairs and briefly describe the physical and trade time. We then analyze the definition of the response functions in Sect. 3, and compute them for the majors pairs in Sect. 4. In Sect. 5 we show how the spread impact the values of the response functions. Our conclusions follows in Sect. 6.

2 Data set

In this study, we analyze foreign exchange pairs from the foreign exchange market.

We selected the foreign exchange market because ...

The foreign exchange financial data was obtained from [HistData.com](https://www.histdata.com). It contains tick data in generic ASCII format for different years. The data comprises the date time stamp (YYYYMMDD HHMMSSNNN), the best bid and best ask quotes prices in the Eastern Standard Time (EST) time zone. No information about the size of each transaction is provided. Also, the identity of the participants is not given.

3 Response functions

In Sect. 3.1 we establish the fundamental quantities used in the price response definitions. In Sect. 3.2 we describe the physical time scale and the trade time scale. We introduce the price response functions used in literature in Sect. 3.3.

3.1 Key concepts

3.2 Time definition

3.2.1 Trade time scale

3.2.2 Physical time scale

3.3 Response function definitions

4 Price response function implementations

In Sect. 4.1 we analyze the responses functions in trade time scale and in Sect. 4.2 we analyze the responses functions in physical time scale.

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4.1 Response functions in trade time scale

4.2 Response functions in physical time scale

5 Spread impact in price response functions

As we showed in 1, due to the difference in the position of the decimal points between foreign exchange rates, we need to introduce a “scaling factor” with the purpose of bringing the pip to the left of the decimal point. For example, the scaling factor for the USD/JPY is 100 and that for the EUR/USD is 10000.

The pip bid-ask spread is defined as [4]:

$$\text{pip}_{spread} = (a(t) - b(t)) \cdot \text{scaling factor} \quad (1)$$

6 Conclusion

7 Author contribution statement

TG proposed the research. JCHL developed the method of analysis. The idea to analyze the spread impact was due to JCHL. JCHL carried out the analysis. All the authors contributed equally to analyze the results and write the paper.

One of us (JCHL) acknowledges financial support from the German Academic Exchange Service (DAAD) with the program “Research Grants - Doctoral Programmes in Germany” (Funding programme 57381412)

Appendix A Foreign exchange pairs used to analyze the spread impact

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