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DATA STRUCTURE AND ALOGORITHM

Assignment supporting document

FOREIGN EXCHANGE MARTKET

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1 Introduction

The Foregin Exhange Market (FOREX) started with the appearance and development of money. Money has been utilized as a currency exchange for many different types of goods and services. The earliest evidence of money usage appeared about 4,500 years ago in Mesopotamia (present-day Iraq). Archaeological stamps demonstate that people are used to paid a certain amount of silver in exchange for goods and began to use minted coins from various alloys as a means of payment. [1]

The common parity system quickly spreads throughout the world. In different countries, different alloys are used to cast coins, however, gold, silver, brass and copper are the most common materials. Paper money appeared much later and first appeared in China. Around the tenth century, the Chinese emperor then issued very heavy but low value coins in payment. People feel uncomfortable using these currencies and exchanging them for receipts that show the exact value of goods from merchants. A century later, the Chinese feudal court removed these receipts from circulation and ordered printing of banknotes to use them as legal tender. This is the starting point for paper money.

Today's forex market has existed since the 1970s, when the fixed exchange rate was replaced by floating exchange rates, which allowed thousands of individual and institutional investors to make a profit from their changes. The Forex market is often referred to by another name as the Forex market, or simply Forex. The foreign exchange market is perhaps the world's most liquid financial market. Its average daily sales are about 4,000 billion US dollars [1]. High liquidity means that at any time, if an individual wants to sell a certain amount of foreign currency, there will be another individual who wants to buy that foreign currency with the same amount.

Today, the main players in the market are central banks, commercial banks and investment banks as well as professional investors and traders. In fact, these institutions conduct most of their transactions and are considered Market makers because they have the ability to influence the prices of currencies.

2 Terms and concepts

2.1 Currency and currency pairs

The national currency is the national monetary unit of a country or a group of countries; for example the Euro in Western Europe, the dollar in the US, and the Yen in Japan. The exchange rate between two currencies shows how much one currency is priced in another. The term currency pair is commonly used on the Forex market.[1]

In the market, a currency pair is valued by one value. For a currency pair X / Y = A, we say, to buy 1 coin X, we need A currency Y. For example, EUR / USD = 1.1025, we need 1.1025 USD to buy a EUR 1 or to buy 1 EUR we have to sell 1,025 USD. Therefore, X is called the buying currency (Base Currency - BC) and Y is the selling currency (Quote Currency - QC). [2]

2.2 PIP (Percentage In Point)

PIP is another basic concept in forex trading. It stands for phrase Percentage In Point (PIP) and the smallest fluctuating unit of exchange rate. For example, if the exchange rate of the US dollar against the Swiss Franc is USD/CHF is 1.2212 and after that increases to 1.2213, which means that the exchange rate has increased by one percentage point, or 0,0001.[1]

The spread is the difference between the price the market maker is willing to pay to buy a currency and the price at which he is willing to accept the sale of that currency for a specified period of time. This is also the difference between the buying and selling prices of a currency. For example, if the purchase price of USD / CHF pair is 1.2212 and the corresponding selling price is 1.2215 at 10:30 am, the difference here is three percentage points.

2.3 Japanese candle pattern

The Japanese candlestick [1, 2] chart is the earliest and most popular method of performing price movements of financial markets. It was developed by a Japanese rice merchant named Homma Munehisa in the sixteenth century. He realized it was possible to predict future prices through an analysis of its performance in the past. Homma found that candlestick patterns tended to repeat, so he began to analyze them and become a very successful trader. To this day, Japanese candles are still the most popular market analysis method. Candlestick charts are very similar to bar charts because they indicate the direction of market trends.

Usually, the main body of a candle showing the upside will be white and the main body of a candle showing the down price will be black (Figure 1). The upper shadow, for upwards

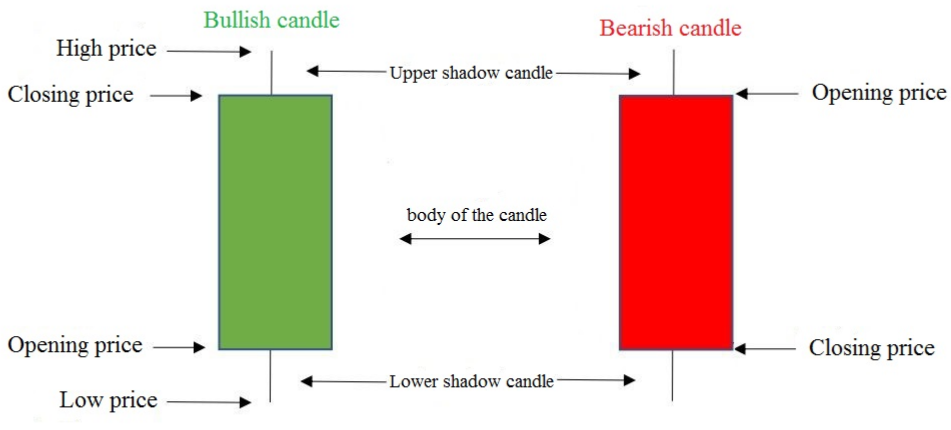

Figure 1: Definition of bullish and bearish candles

candles is the gap between the closing price and the highest price in the period that it is shown, for the downward price candle is the distance between the opening price and the high price in the period in which it is shown. The lower shadow, for the upwards is the gap between the opening and the low in the period it represents, for the downward price candle is the gap between the closing price and the low in the period it represents. It should be noted that candles can also form gaps.

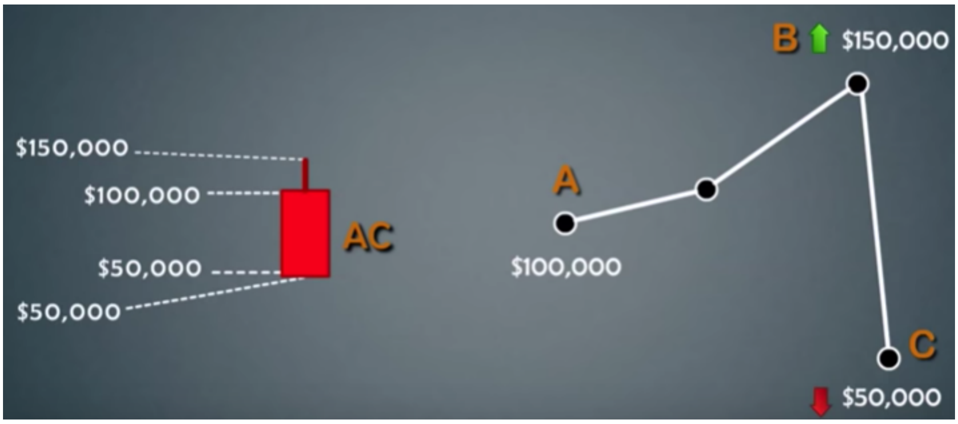

Figure 2: Correlation between price candle and line chart

3 Some basic candlestick patterns

3.1 Spinning tops candlestick pattern [1]

Candlestick pattern with long upper shadow and lower shadow, small body is called a spinning top candle.

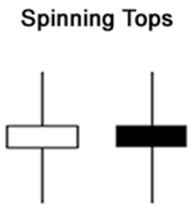

Figure 3: Example for a spinning top candle

For example, a candle with OP = 1.1025, CP = 1.1028, HP = 1.1126, LP = 1.0985 is a candle with a spinning top.

3.2 Marubozu [2]

Mazuboru candle is a non-shadow candle with only a long body, ie the candle only open and close. At this time, the opening and closing prices have coincided with the highest or lowest prices of the session.

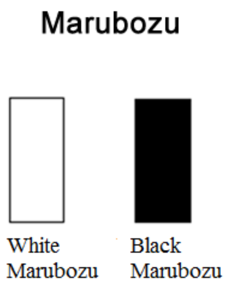

Figure 4: Example for Marubozu candle stick pattern

For example, a candle with OP = 1.1025, CP = 1.1126, HP = 1.1126, LP = 1.1025 is a Marubozu candle.

3.3 Doji [2]

A Doji is a candlestick pattern where the closing price and the opening price are equal or nearly equal (difference of no more than 2 PIPs), that is, the body of the candle will be very small, just like a thin horizontal line if you look on the chart.

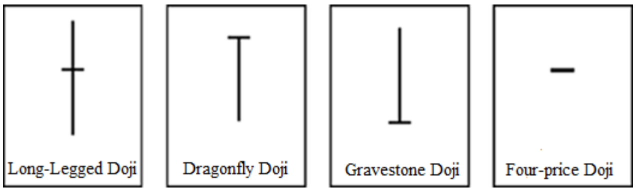

Figure 5: Example for Doji candlestick pattern

In addition, we have 4 types of special Doji candles:

- Long-legged Doji, that is, both the upper and lower shadow are long.
- Dragonfly Doji, only exists under the long lower shadow.
- Gravestone Doji, meaning that only long shadow candles exist.
- Four-price Doji, ie does not exist shadows.

3.4 Engulfing candlestick pattern [2]

The bullish Engulfing candlestick pattern is a pair of 2 candles, indicating a strong price increase. This pattern appears when a bearish candlestick appears but is followed by a very large bullish candlestick. The bullish candle appears after completely engulfing the previous bearish candlestick (the bearish candlestick opens and closes within the opening and closing price range of the bullish candlestick). The case of bearish Engulfing candlestick pattern is opposite.

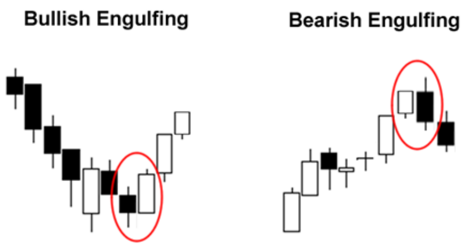

Figure 6: Example for engulfing candlestick pattern

References

[1] A. Darazhanov, Forex 100%, AdmiralMarkets (2018).

[2] Lessons in Vietnamese Trader Community, https://traderviet.com/forums/lop-hoc-mo-hinh-nen-nhat.39/