# Slippage

From the point of view of a trader, inevitably, error occurs between the *advertised* price and the *actual* price received when an order is transmitted from computer to server. This discrepancy is called ***slippage***. It is common in trading forums to hear inexperienced traders hailing injustices at their broker when slippage affects their position negatively. In all likelihood, these claims are nothing more than a conspiratorial attempt to assign blame for the poor results of undisciplined trading practices. The intention of this section, however, is not to explain why negative slippage might be interpreted as broker dishonesty, but to explain the technical reasoning for its occurrence, which should be understandable to the reader after having reviewed the structure of the continuous trading market.

Between the time a pair of *bid* and *ask* prices is pinged from a broker's server to the time it is advertised on a client's device, a period of latency has occurred, and any transactions which have happened within that period of latency are not reflected in the prices received. One must deduce that *bid* and *ask* prices should not be interpreted for prices as they *are*, but as they (very) recently *were*. There is a second period of latency which accumulates with the first: this is the time between when the client submits an order and the time the order is executed on the broker's server. During this pivotal period, the order must be transcribed into a web request and travel to the broker's server. The order must then be transcribed again into a format readable by the processing server and inserted into a work queue. The order will then be drawn from the queue and processed asynchronously against the state of the order book at the time the order is drawn. Here, the point is not to understand the necessary protocol for processing orders, but rather to acknowledge that the task is not instantaneous. Within the latency period, the influx of requests from many other interested traders will be processed, and the order book will be modified

through their requests. The entire latency period may range between 1 to 2 seconds, but such a period, in the computing world, is a lifetime.

Figure X.x—Demonstrating the network and server latency that contributes to slippage.
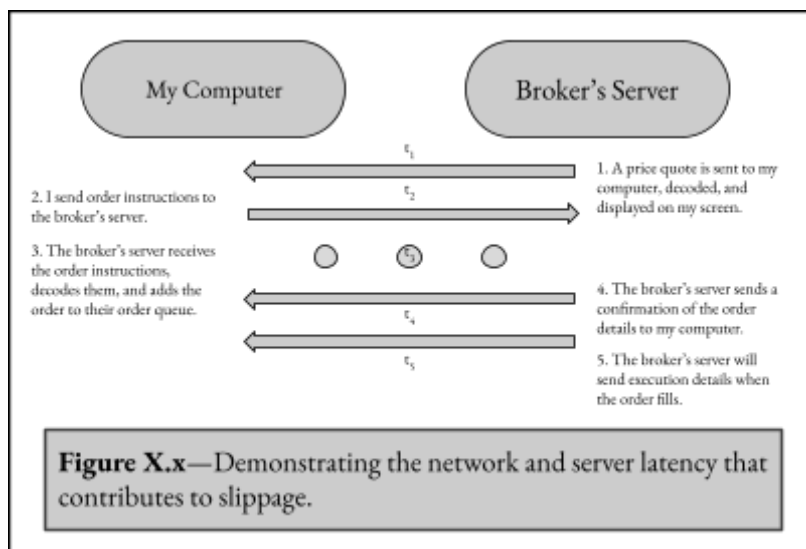
There is simply no way of knowing how an order book will change in the latency period between when I, as a trader, transmit a market order to my broker and when that order is processed by the broker's server. While incredibly unlikely, it is possible that all of the market's market-makers decide at once to revoke their orders a fraction of a second before I submit a market order. I have submitted my order under the assumption there is depth at the price I am satisfied with. As I await my execution confirmation, I can only watch helplessly (and disappointedly) as my order is filled well above the offer price I was hoping to receive. This unfortunate outcome could have been easily avoided had I used the *"Fill-or-Kill"* order type, or, more simply, limit price protection.

A far more likely scenario than a complete market collapse, a trader can expect that certain news releases will generate extraordinary price imprecision. Slippage, in the wake of a news release, will be abnormally large for two reasons: the higher than average load of contemporaneous requests from

interested traders on the broker's server, and a relatively shallow market as market-makers withhold their commitment until they themselves have processed the data from the news. In moments of high volatility, a trader can limit their risk exposure to slippage by simply abstaining from trading. If a trader does elect to trade, it is best not to be lackadaisical with the use of market orders. Trades during events should be premeditated and factor in a wider risk-tolerance for slippage.

In this section, we have sought to cover the technical basis for slippage. Slippage is the result of the asynchronous protocol of a server handling the requests of many traders modifying a single order book in real time; it should be regarded as statistical noise, which ought to have a neutral effect over a large sample of trades. Traders, however, have sticky memories for instances when slippage negatively affected them—less so for when slippage *positively* affected them. Due to this known psychological phenomenon, it is understandable that, in the narrative of a trader's trading, the broker would become the conspiratorial villain. It is the prerogative of the trader to select a reputable broker they trust. Slippage is certainly the result of noise; it could be *inflated* as a result of broker bias. A trader can make this determination for themselves, beginning with a record of advertised prices versus their executed price. If the broker is at all reputable, the trader will find noise, not bias in their test.

Scenario X.x

I am closely monitoring SPY—an ETF which tracks the movement of the S&P 500 Index—before and during a Federal Reserve interest rate policy decision meeting. This meeting will probably have a large impact on U.S. markets. If members of the Federal Reserve board decide to increase interest rates earlier than expected, it could result in a large selloff in the stock market overall. Generally speaking, higher interest rates

translate to higher yields in the bond market, while making borrowing more prohibitive for businesses, which will slow economic growth. Investors will evaluate these fluctuating conditions according to their risk. The likely market reaction will result in a flow from the stock market into the bond market. As investors make the necessary adjustments, supply in the stock market will temporarily outweigh demand.

At two o'clock, the Federal Reserve releases their last board meeting minutes and the Fed chair holds a press conference shortly after. The meeting minutes indicate that interest rates were not raised at this meeting; however, members are leaving the door open to an increase at their next meeting in two months. This news comes as a surprise to investors who had not discounted a rate hike this year. Stocks begin to sell off sharply.

As the news comes across my screen, SPY is selling at $402.55 per share, then $402.20, then $400.99—all this movement happens in a matter of seconds. I send a market sell order when I am quoted $400.43, hoping the order executes above $400 per share. I receive confirmation that my order is executed at $400.21 per share. 22 cents of slippage is disappointing but I am more relieved to have exited the position. The price of SPY continues to plunge—$399 per share, $397. It bottoms out at $395 per share and remains at that price for the duration of the trading day.