Forex Arbitrage

Since the opening of the EES FX ECN, Elite E Services has received many inquiries about so called 'arb' systems. EES has never developed these types of systems directly, however we have known other traders who had developed Forex arbitrage systems on an institutional basis, and have had MT4 customers who have developed arb EAs. The following is an explanation of what arbitrage is, and in further articles we will delve into larger technical issues of executing such systems.

What is 'arbitrage' ?

*In economics and finance, **arbitrage** (IPA: /ˈarbɪtrɑːʒ/) is the practice of taking advantage of a price difference between two or more markets: striking a combination of matching deals that capitalize upon the imbalance, the profit being the difference between the market prices. When used by academics, an arbitrage is a transaction that involves no negative cash flow at any probabilistic or temporal state and a positive cash flow in at least one state; in simple terms, it is the possibility of a risk-free profit at zero cost.*

In principle and in academic use, an arbitrage is risk-free; in common use, as in statistical arbitrage, it may refer to expected profit, though losses may occur, and in practice, there are always risks in arbitrage, some minor (such as fluctuation of prices decreasing profit margins), some major (such as devaluation of a currency or derivative). In academic use, an arbitrage involves taking advantage of differences in price of a single asset or identical cash-flows; in common use, it is also used to refer to differences between similar assets (relative value or convergence trades), as in merger arbitrage.

*People who engage in arbitrage are called **arbitrageurs** (IPA: /ˌarbɪtrɑːˈʒɜr/)—such as a bank or brokerage firm. The term is mainly applied to trading in financial instruments, such as bonds, stocks, derivatives, commodities and currencies.*[i]

Types of financial arbitrage

- Arbitrage betting
- Covered interest arbitrage
- Fixed income arbitrage
- Political arbitrage
- Risk arbitrage
- Statistical arbitrage
- Triangular arbitrage
- Uncovered interest arbitrage
- Volatility arbitrage

Broker arb

Broker arb is where a trader capitalizes on a price discrepancy between 2 brokers in the same market. For example Broker A offers a price of 1.4542 and Broker B offers a price of 1.4556. Broker arb is fair in that the broker is offering the price, but brokers who throw many bad prices may not like that traders are taking advantage of those bad prices.

Some customers of large retail US based brokers have said that certain brokers will give different prices to different customers. In cases like this, broker arb would be a viable trading strategy but it would be questionable if they would allow you to keep your profits.

Latency arb

Latency arb is when a trader takes a network advantage over the markets. This may take many forms, but the concept of latency arb is a network or 'speed' advantage that allows you to see into the future.

Latency arb is practiced both on a retail and institutional level. It became popular in Forex in 2007[ii], however, due to a large amount of new participants entering the strategy, and due to large scale network and I.T. infrastructure upgrades undertaken by major market players, it is less viable today.

Retail latency arb is a highly debated topic in the MT4 community. On forums you will find many developers offering software that uses a 'fast broker' and a 'slow broker' to arb based on what is in fact latency arb. The dangers of this type of trading are that:

- If the 'slow broker' is really slow, your profits could be large and he may not allow you to withdraw them
- There can be network or software upgrades that the strategy may work for a certain period of time and then stop working.

Software arb

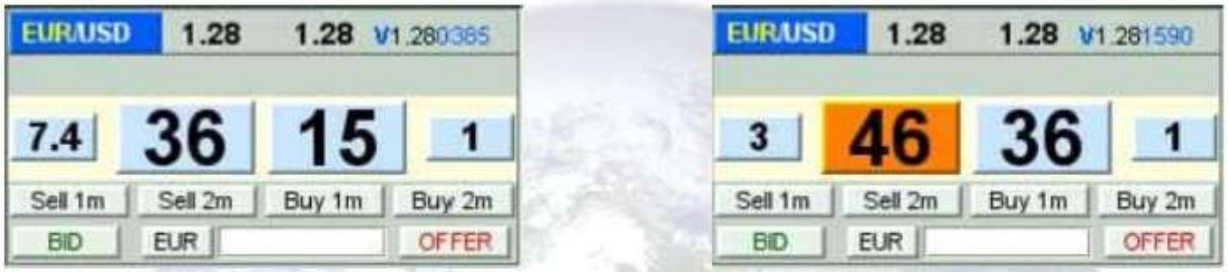
The least ethical, most dangerous, and most difficult to execute, is arb that takes advantage of discrepancies inside the software trading platform. This was noticed in 2007 by some EA developers that had strategies that could effectively trade price discrepancies between MT4 server and MT4 terminal. In certain builds of MT4, MT4 would only update the terminal every X ticks (let's use 10 as extreme example) – the terminal price was guaranteed, so an EA could hammer the MT4 server for requests for new prices, and in some cases, the server price was different than the terminal price, thus allowing for risk free arb. This was however not 'real' trading.

Information arb

This is the least defined, and the highest probability of success of any type of arb. Most have disregarded this strategy because of insider trading laws pertaining to securities, but information arb can take other forms in other markets that do not have insider trading laws. The most common example of information arb is in the movie Trading Places, when the Duke brothers attempt to learn the forecast of the Orange crop report before it's released to the market. With information arb, a trader has a 99% guarantee of success, 1% leaving that it is always possible that information can change during that time.

Market arb

In rare cases, market discrepancies will allow for arbitrage on a pure market basis. It is so rare in fact, it isn't likely that a trader could base a strategy completely on this method. See the below snapshot of Currenex during NFP release:



Risk arb

Risk arb, or merger arbitrage, is when a hedge fund bets on the price of a stock which will change in price in the event of a merger or acquisition. There is supposedly a calculable chance of the deal not going through, which can be built into the strategy in the form of out of the money options, to limit the risk in the event of a negative outcome. Risk arb is an example of a type of arb that really isn't arbitrage according to the traditional definition, but is used to describe the high probability that a stock price may go to a pre-defined level based on the proposed merger.

Two principal types of merger are possible: a cash merger, and a stock merger. In a cash merger, an acquirer proposes to purchase the shares of the target for a certain price in cash. Until the acquisition is completed, the stock of the target typically trades below the purchase price. An arbitrageur buys the stock of the target and makes a gain if the acquirer ultimately buys the stock.

In a stock for stock merger, the acquirer proposes to buy the target by exchanging its own stock for the stock of the target. An arbitrageur may then short sell the acquirer and buy the stock of the target. This process is called "setting a spread." After the merger is completed, the target's stock will be converted

into stock of the acquirer based on the exchange ratio determined by the merger agreement. The arbitrageur delivers the converted stock into his short position to complete the arbitrage.

If this strategy were risk-free, many investors would immediately adopt it, and any possible gain for any investor would disappear. However, risk arises from the possibility of deals failing to go through. Obstacles may include either party's inability to satisfy conditions of the merger, a failure to obtain the requisite shareholder approval, failure to receive antitrust and other regulatory clearances, or some other event which may change the target's or the acquirer's willingness to consummate the transaction. Such possibilities put the risk in the term risk arbitrage.

Additional complications can arise in stock for stock mergers when the exchange ratio is not constant but changes with the price of the acquirer. These are called "collars" and arbitrageurs use options-based models to value deals with collars. In addition, the exchange ratio is commonly determined by taking the average of the acquirer's closing price over a period of time (typically 10 trading days prior to close), during which time the arbitrageur would actively hedge his position in order to ensure the correct hedge ratio.[iii]

Difference between pure arbitrage and subtle arbitrage

Pure arbitrage would be if you had in the same pair a price discrepancy where you could buy in one account, sell in another, and have a risk free profit of the discrepancy. This is known in all markets as pure arbitrage. The word 'arbitrage' however has expanded to mean more subtle forms of arbitrage such as statistical arb and triangular arb which while not pure arb, they employ a 'mean reversion' calculation that implies that no matter what happens, 99.9% of the time the market will revert to the mean model. This is also the case in Risk arb, clearly not a form of pure arb, but still called arbitrage nonetheless.

Ethical Issues

Some believe that some forms of arbitrage are somehow taking an unfair advantage of the market. While this is debatable, the larger issue is that due to perception by some, they may not allow a trader to withdraw his profits.

Trading with arb

Trading any type of arb model poses unique risks, challenges, and costs not associated with traditional trading systems. Anyone who is considering 'arbitrage' should consider:

- It may require substantially more time investment
- Many arb systems require a large investment in computer and network hardware
- May require an extensive experience in trading, I.T., and mathematics

- As arb is always evolving, information obtained on the internet may be outdated
- Large risk in some types of arb where you may not be able to withdraw your profits, or you may only have 1 leg filled causing the model to not be arb but an actual trade!

Conclusion

Arbitrage is a niche that while it can be profitable for extremely experienced and well funded traders, there are many unique 'unknown unknowns' when trading these types of systems. Even with a substantial time and money investment, combined with excellent research, it may not provide a guarantee for profit (which is implied assumption of arb systems).

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[i] http://en.wikipedia.org/wiki/Arbitrage
[ii] http://www.ftmandate.com/news/fullstory.php/aid/1418/Battle_of_algorithms_beckons.html
[iii] http://en.wikipedia.org/wiki/Risk_arbitrage