

# ARBITRATION STRATEGIES

Arbitration is a trading style based on profit from the price difference between two or more interrelated assets or goods.

The essence of all arbitrage strategies is to search for price imbalances between a group of interconnected financial instruments, and to conduct simultaneous trading operations in the direction of eliminating these imbalances.

## Arbitration strategies characterized

high profitability

low risk

market neutrality

and the ability to transfer trading to automatic (semi-automatic) mode.

We will consider the main types and features of arbitrage strategies that are time-tested and are in demand by the best investors in the world.

So, arbitration is speculation on the price difference of interconnected goods or assets. Depending on the nature of this relationship, arbitration may be deterministic or statistical.

Deterministic arbitration implies a fundamental relationship between instruments that ensures that this relationship remains in the future. An example is a stock and futures for this stock, stocks and depository receipts for the same stocks, the same product presented on different markets, etc.

Statistical arbitration involves only a statistical relationship between the instruments, which is based solely on historical observations and does not guarantee the preservation of this relationship in the future. Examples include stocks of companies in one sector, futures for oil of different grades, ordinary and preferred shares of one issuer, etc.

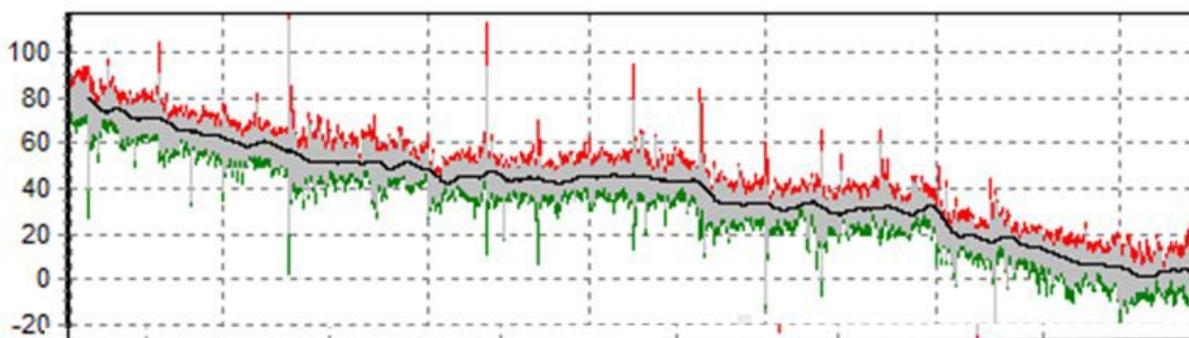
This is the most common classification of arbitrage strategies. Different subclasses of strategies are distinguished depending on the types of financial instruments used and on the methods of trading. Consider the most famous options.

## CLASSIC ARBITRATION

Classical arbitration is one of the simplest types of arbitration, based on the use of the relationship between any underlying asset and a financial instrument (derivative) derived from it. The most common option is to trade a pair of shares ("spot", goods with immediate delivery) and futures (goods with deferred delivery).

Where does the price difference come from if essentially identical instruments appear in transactions? The fact is that futures, in comparison with a stock, require significantly less funds to open a transaction (only guarantee support), and the remaining money can always be placed on deposit. The market takes this opportunity into account and lays in advance the expected value of additional income from the deposit in the futures price. Therefore, in a normal situation, the value of the futures is always higher than the value of the stock, and this difference is constantly decreasing over time, reaching zero at the time of expiration of the contract. However, differences in the expectations of market participants regarding interest rates and the value of the underlying asset contribute an additional "noise". As a result, small fluctuations in the difference in prices of futures and stocks constantly arise, on which traders and arbitrageurs make money.

**An example of a typical graph of the price difference (spread) between futures and stocks:**



This strategy is suitable for cautious traders, as it has extremely low risks and, if used correctly, can bring up to 20% per annum. However, it should be noted that because of its prevalence, this strategy is characterized by a high degree of competition among traders on most trading instruments, therefore, for its successful implementation, as a rule, it requires fast communication channels with the exchange and a modern trading infrastructure.

## INTER-EXCHANGE ARBITRATION

Very often, the same or equivalent instruments are traded on different exchanges, for example, most commodity futures. For various reasons, both objective and purely random in nature, price differences regularly arise between exchanges, which can be used to quickly and practically risk-free profit. This is the basis of the strategy of OTC arbitrage.

The technology for implementing this type of arbitrage is very simple: when on one of the exchange platforms the price of goods becomes higher (lower) than on the other, at the same time opposite transactions are made on both exchanges. Cheap goods are bought, expensive goods are sold. Since the same product is being traded, after a while the prices are aligned and the trader can exit the transaction with a small but guaranteed profit.

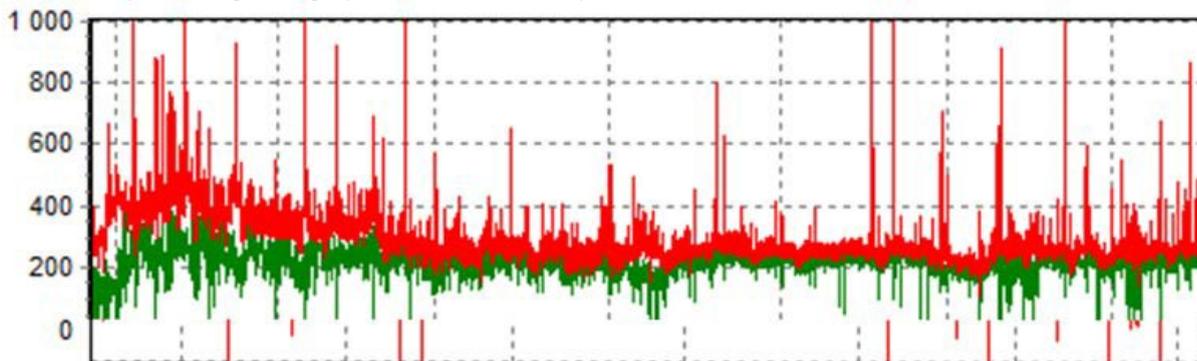
However, at present, the price difference for most liquid instruments at different sites is either very small or arises and disappears so quickly that it is practically impossible to use it. This is largely due to the high popularity of this strategy among large players using high-frequency trading robots, arbitrageurs, continuously monitoring the slightest price differences between exchanges. These robots create fierce competition, constantly competing with each other in the speed of obtaining quotes and submitting applications. Therefore, an ordinary trader without significant infrastructure costs to engage in this struggle is pointless.

But, despite all these difficulties, it is still possible to earn money with the help of over-the-counter arbitrage if you show your imagination and choose specific trading floors, young exchanges, or exotic instruments that are not interesting to large players for various reasons.

## CALENDAR ARBITRATION

Calendar arbitrage applies to deferred delivery instruments (most derivatives, i.e. derivatives, belong to this category), primarily to futures. The essence of the strategy is simple. Two futures, with short and long-term expiration, are taken. With constant expectations of market participants regarding the interest rate, the price difference between them will remain constant and will be equal to the amount of additional income that can be obtained if funds released as a result of the purchase of a futures are placed at interest for a period equal to the number of days between the dates of expiration of these futures. However, as in the case of classical arbitrage, due to different expectations of traders, different activity in the near and far futures and other random phenomena, the price difference between the contracts makes constant fluctuations relative to the theoretical "fair" value, providing the opportunity to perform arbitrage operations.

As an example, let's give a graph of the calendar spread between futures on BMW shares:



## STATISTICAL ARBITRATION

The essence of statistical arbitrage follows from its very name “statistical”. If all the types of arbitrage strategies discussed above are based on a strict fundamental relationship between financial instruments, then statistical arbitrage is based only on statistics, i.e. on historical observations showing the relationship between assets. The main task when using this strategy is to select such financial instruments (or a group of instruments), the price difference between which would make constant oscillatory movements with respect to some average value, which should remain constant or change rather slowly compared to the frequency of fluctuations. Having chosen such a combination, you can use these fluctuations to make a profit, trading on the return to the average value. Our company does not use this type of arbitrage in its trade because of the high risk.

## INDEX ARBITRATION

Index arbitrage involves working with any index instrument (for example, index futures) and a basket of instruments that are components of the corresponding index. In addition to index futures, various ETFs, fund units, as well as any other financial instruments, the cost of which is calculated based on the value of a certain group of assets, can also be used. The task of the trader in this case is to select a model basket that would fully or partially repeat the composition of the index instrument. You can then use the price differences between them for arbitrage trading.

An example of index arbitrage in the Russian market is a combination of futures on the RTS index and baskets of blue chip stocks (Gazprom, Lukoil, Sberbank, etc.). On EUREX, you can try a combination of futures on the DAX index and baskets of its components.

In practice, completely repeating the composition of the index or ETF is either very difficult due to the large number of incoming instruments, or even impossible. Therefore, traders, choosing a model basket, as a rule, take only the main tools that have the largest weight in the index. As a result, depending on how accurately the trader's model basket repeats the composition of the index, the strategy will be closer to either deterministic arbitrage or statistical arbitrage with all the advantages and disadvantages of these types of arbitrage.

## CONCLUSION

In this article, we examined the main types of arbitrage strategies. All of them, in theory, are capable of ordinary traders, it is enough to show a desire to understand the issue. From a practical point of view, all arbitrage strategies, without exception, require special software that allows you to track the dynamics of several assets and instantly sell and buy groups of financial instruments in case of arbitrage situations. In addition, without special conditions on the brokerage commission, the implementation of strategies will not be feasible. The skill of traders is a particularly important inseparable part of the arbitrage earnings process.