# The automated electronic exchange SOFFEX

**Partially or fully automated exchange systems are replacing open outcry trading. Although the application of technology in financial services has traditionally been restricted to reducing transaction costs and automating routine functions such as clearing and settlement, the potential exists to change completely the way trading occurs. This article describes aspects of the Swiss Options and Financial Futures Exchange (SOFFEX), the first fully automated electronic exchange.**

SOFFEX is a fully-automated derivative exchange where traders may buy or sell a variety of options and futures contracts

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directly from workstations in their offices. Unlike open outcry systems, each trader is guaranteed the best price available at all times, regardless of the size or position of the trader.

The large majority of trades at SOFFEX are anonymous. Although special functions exist to allow traders to list their identities with their orders, these block trades must occur inside the "inside market," i.e., between the highest buy order or lowest sell order.

SOFFEX has traded options contracts since 1988, and futures contracts since 1990. Options are based on Swiss blue chip stocks and the Swiss Market Index (SMI). Futures contracts are based upon European indices and short term interest rates.

This article focuses on a subset of trading functions that best demonstrate the far-reaching potential of the electronic marketplace. These functions are automatic matching and combination/synthetic matching.

## Automatic matching

The most important difference between SOFFEX and an open outcry exchange is the principle of automatic and anonymous matching. At SOFFEX, it is impossible for any participant to trade outside of the market. The electronic exchange automatically determines whether each incoming order can match. If so, it will match at the best available price in the market. All traders are treated equally.

## Flow of orders through automatic matching

If an order does not match immediately, it can be held in the centralized "order books" for a specified period of time. Later the order can match against other incoming orders as appropriate. Traders may also specify orders with limit prices or "fill-or-kill" restrictions.

The SOFFEX system determines trade prices on a case-by-case basis according to published matching rules. It is possible for one incoming order to match against several "book" orders at different prices.

## Combinations / Synthetic Matching

One of the most interesting and advanced features of SOFFEX is its ability to match *combinations* of contracts against each other or against simple orders. A combination is an order to buy or sell more than one contract at the same time. Each contract in a combination is called a *leg*. For example, a trader may take a position buy, buying one option and selling another simultaneously. These combination functions allow traders to create bull and bear spreads, butterflies, straddles, strangles, etc.

The advantage of SOFFEX is that the exchange itself calculates and displays the prices of these combinations, and allows traders to buy and sell them as regular orders. Execution of these trades can occur against other combination orders, or against regular orders without prejudice to order types. Indeed, traders need not care whether their combination traded against two simple orders or another combination.

Liquidity is enhanced by matching simple orders against combination orders whenever possible. As long as prices are available in one contract and in the combination market, liquidity is automatically transmitted to all contracts.

Although SOFFEX has implemented a subset of these combination functions, the implications of this functionality demonstrate a significant advantage of electronic trading over open outcry. With the right enhancements, SOFFEX could trade any possible combination of its contracts transparently. The ultimate expression of this idea is to have no pre-defined combinations, but rather to create them on demand.

SOFFEX shows the first wave of the evolution towards fully-automated exchanges. Anonymous automatic matching with the computer as referee and the automatic synthesis of complex multi-leg combinations are two of the most revolutionary applications of technology to financial markets.

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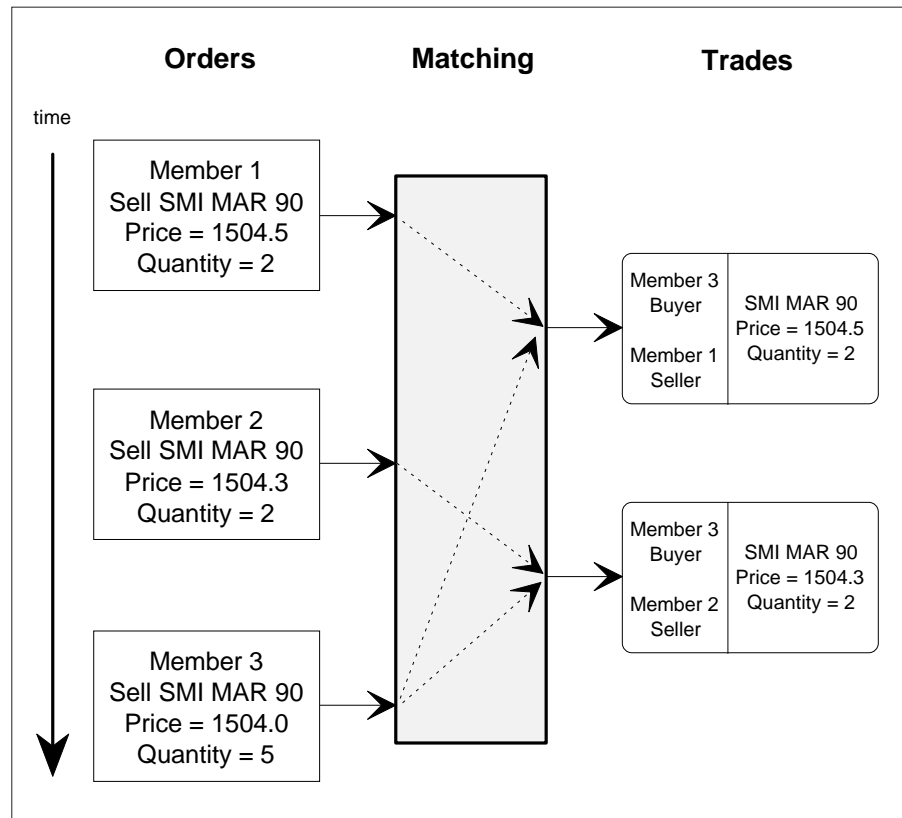
Fig. 1: Flow of orders through automatic matching