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Algorithmic Trading Explained

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"... the increase in the speed of information dissemination means that share prices adjust rapidly, so the ability to capitalise on information asymmetry has fallen such that he who has the ability to analysis information quickly and execute a trade the fastest benefits the most."

The Rise of the Machines

As internet-based technology and computers have advanced, and the new generation of share traders become more experienced, the use of electronic-trading platforms has increased rapidly. Instant connectivity, greater variety, and falling transaction costs all became available to the average person. The introduction of trading platforms based upon internet technology has bolstered a rapid increase in trading volumes, but more importantly, the speed by which one could execute a trade has increased dramatically.

Add to this the increase in the speed of information dissemination means that share prices adjust rapidly, so the ability to capitalise on information asymmetry has fallen such that he who has the ability to analysis information quickly, accurately and execute a trade the fastest benefits the most.

As information technology systems have grown, it has become possible to perform advanced mathematical computations in real time. Trading systems based upon intricate statistical formulae have been crafted and implemented, making it necessary to consider computer based trading systems, or algorithmic trading, as a necessary tool for trading.

However, turning over the trading decisions to a computer is also fraught with danger. The growing volumes of trading, executed by computer trading systems, has produced markets that are vulnerable to heightened volatility and lightning-fast pricing fluctuations.

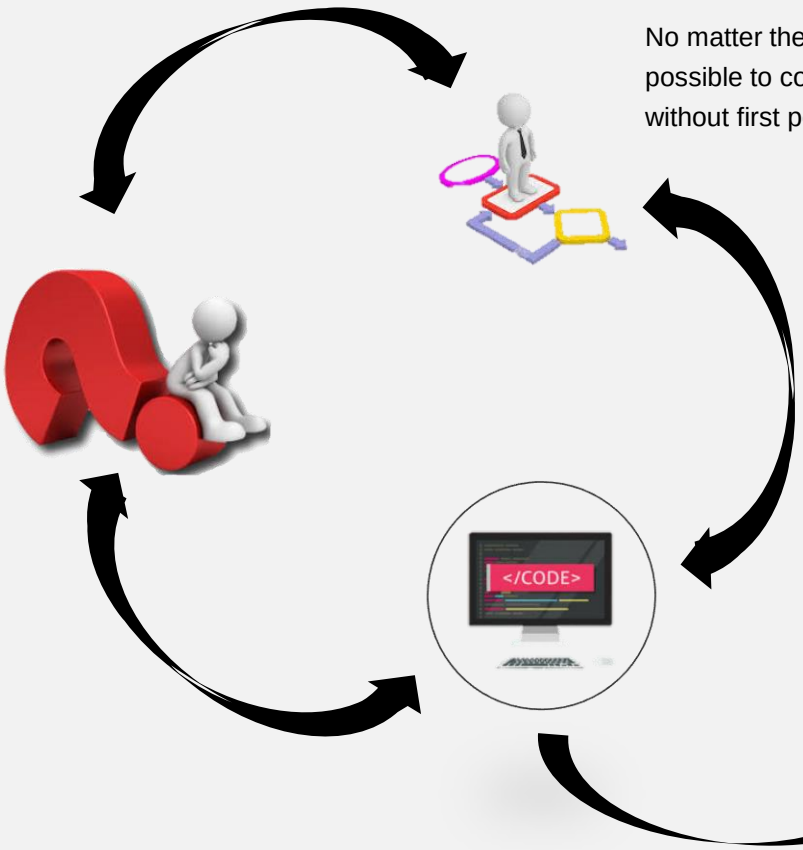
AGILIS CAPITIS – ALGORITHMIC TRADING

What is Algorithmic Trading?

Algorithmic trading (also referred to as algo-trading, automated trading, or black-box trading) is, in simplest terms, to "automate" trading activities by using computers instead of humans to execute trades. Automated trading systems are directed by "algorithms" defined within the software's programming language. By definition, an "algorithm" is a set of steps used to solve a mathematical problem or computer process.

The term "algorithmic trading" refers to the practice of using computers to place trades automatically according to defined criteria contained within the software's programming code. The implementation of algorithmic trading, within the context of the electronic marketplace, is dependent upon the development of a comprehensive trading system. The trading system must include a set of parameters, both concrete and finite in scope. These parameters are a reflection of the adopted trading methodology, and in algorithmic trading, are based upon mathematical computations of varied complexity.

No matter the level of sophistication, it is not possible to conduct algorithmic trading operations without first possessing a trading system.



"…execute each trade within the algorithmic trading system flawlessly, consistently and without emotion."

Algorithmic Trading: Advantages

Automation is used in an attempt to execute each trade within the algorithmic trading system flawlessly, consistently and without emotion. This means using computer technology to remove human error from the execution of the trading system.

"The market can be a difficult place for a trader to behave in a rational, consistent manner."

Consistency

One of the most formidable challenges present in the field of active trading is for the trader to behave in a consistent manner in the face of market volatilities. The stock market is dynamic in nature; chaotic at times, orderly in others, but always evolving.

The market can be a difficult place for a trader to behave in a rational, consistent manner. This results in failure rates of short-term traders in the 70% range.

An algorithmic trading system provides the consistency that a successful trading strategy requires in its purest form. Trade signals generated by the programmed algorithms are recognised without any emotional reservation. Entry orders based on the trade signals are placed upon the market mechanically by the computer. The trade is then managed automatically according to the parameters outlined in the system.

Algorithmic Trading: Advantages

Precision

Precision is required when following an investment strategy, including order entry, stop loss and profit target. As the number of trades a given system is required to execute increases, the more important absolute precision becomes.

If trades are executed erroneously, this creates the risk of generating random and erroneous outcomes, jeopardising the integrity of the trading strategy, and create extensive losses.

Algorithmic trading systems are defined by intricate parameters. Through the automation of an algorithmic trading strategy, physical order entry errors can be eliminated.

"Algorithmic trading systems increase the speed of execution flawlessly, consistently and without emotion."

Algorithmic Trading: Advantages

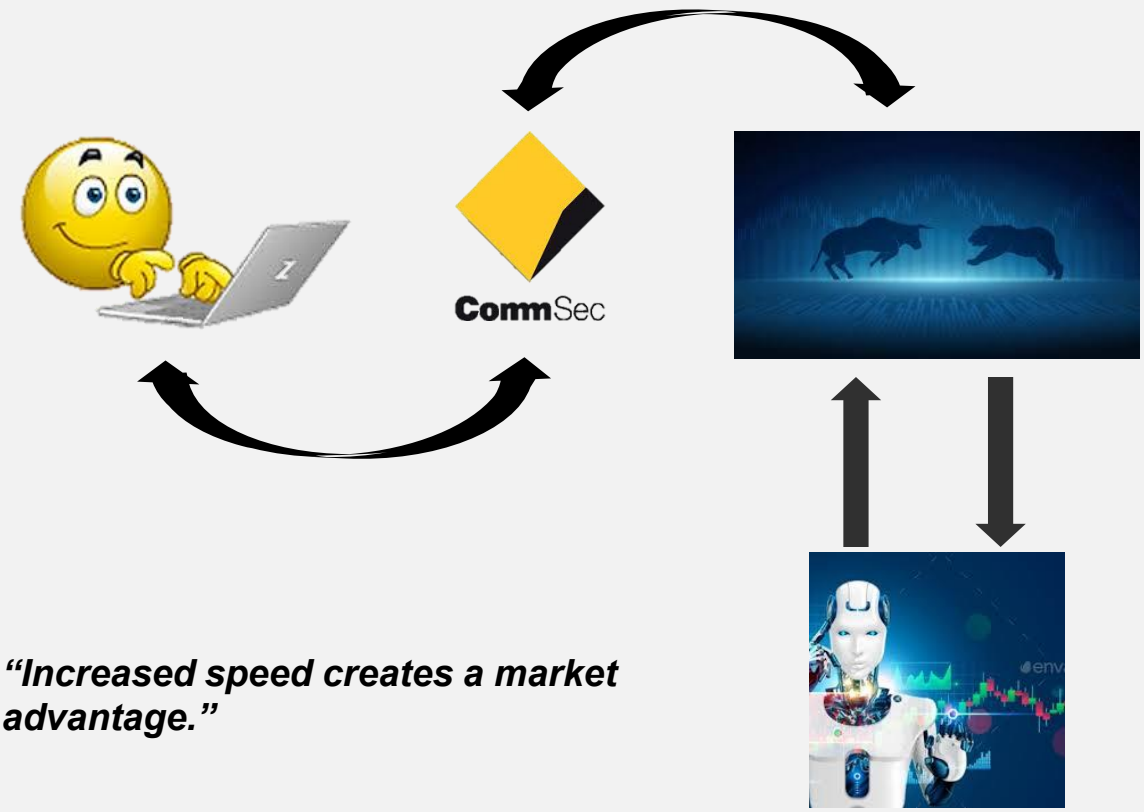
Latency

The ability to enter and exit the market quickly and efficiently can be crucial to the success of an individual trade and to the longevity of a trading strategy.

Latency refers to the execution time. The objective is that if everyone is using the same system and the same information, the faster that the information can be analysed and a trade executed, the greater can the chance of increasing profitability.

Further, latency exists where a manual trade is executed via a broker rather than using direct market access infrastructure normally associate with algorithm trading.

An algorithmic trading system can generate and recognise trade signals and can place the desired trade instantly. From the standpoint of the trader, algorithmic trading systems can serve as a valuable time-saving device. In a marketplace where order execution times are measured and quantified using milliseconds, saved seconds are at a premium.



"Increased speed creates a market advantage."

Algorithmic Trading: Disadvantages

Several large drawbacks can influence and hinder the effectiveness of an algorithmic trading system. Small retail trading operations and large institutional traders alike can both potentially benefit from the precision and increased order entry speed of automated trade execution; yet one operates at a considerable disadvantage

"A rouge trading system can generate significant losses."

Amplification of Systemic Risk

An algorithmic trading system will execute a trade as programed. As algorithms respond quickly to changes in prices and market conditions, they create the risk that they can transmit shocks rapidly from one market to the next, thus amplifying systemic risk. This has created situations such as the flash crash where trading systems executed trades at prices well outside normal parameters.

The impact of a rouge trading system that responds instantaneously to market conditions has implications on the individual trader, where trades are processed in error, generating significant losses; to the extreme market wide impact of creating a ripple effect that intensifies volatility when the market is already experiencing an increase in uncertainty.

Algorithmic Trading: Disadvantages

Technological Issues

Large capital expenditures are undertaken constantly by market participants in an attempt to keep up, or in a few cases, to create an edge.

Although small retail traders and large institutional traders conduct operations within the same electronic marketplaces, each has a vastly different path to the very same market. Services that enable the participant to access the market directly, without broker routing, are available to traders that trade tremendous volumes, or pay large fees, referred to as direct market access (DMA).

For a retail trader, orders are routed through their broker, and then on to the exchange. This provides a level of oversight to identify and correct erroneous trades. Whereas algorithm trading is generally associated with DMA trading that does not have the same level of oversight.

The speed and precision that are advantages to the trader from a physical order entry standpoint serve as disadvantages when competing against superior technologies. However, using algorithmic systems in conjunction with DMA raises the risk of the execution of erroneous trades.

"There is a trade off between analysis and accuracy versus speed"

Algorithmic Trading: Disadvantages

Information Lag

Market participants that do not have a speed advantage need to rely on an information advantage. Asymmetric information is defined as being a situation in which one party to a transaction has information about the transaction that the other party is not privy.

The electronic marketplace, specifically the implementation of algorithmic trading systems, requires market participants to act on information instantaneously. Considering the speed by which prices fluctuate within the marketplace, any participant that is not on par from a technological standpoint will fall behind. It stands to reason that a trader who is able to act on information the fastest has an advantage over those who do not.

Algorithmic trading systems generally rely on quantitative information, including changes in stock prices and volume. As technology advances and machine learning continues to develop, algorithmic trading systems are becoming more advanced, however machine learning is still a long way from true artificial intelligence to understand the impact of qualitative information on a stock price.

Algorithmic trading systems, although able to react instantaneously, are generally only able to be reactive to new information available in the market.

"Algorithmic trading systems are generally only able to analyse quantitative information , at the risk of missing qualitative information."

Algorithmic Trading: Disadvantages

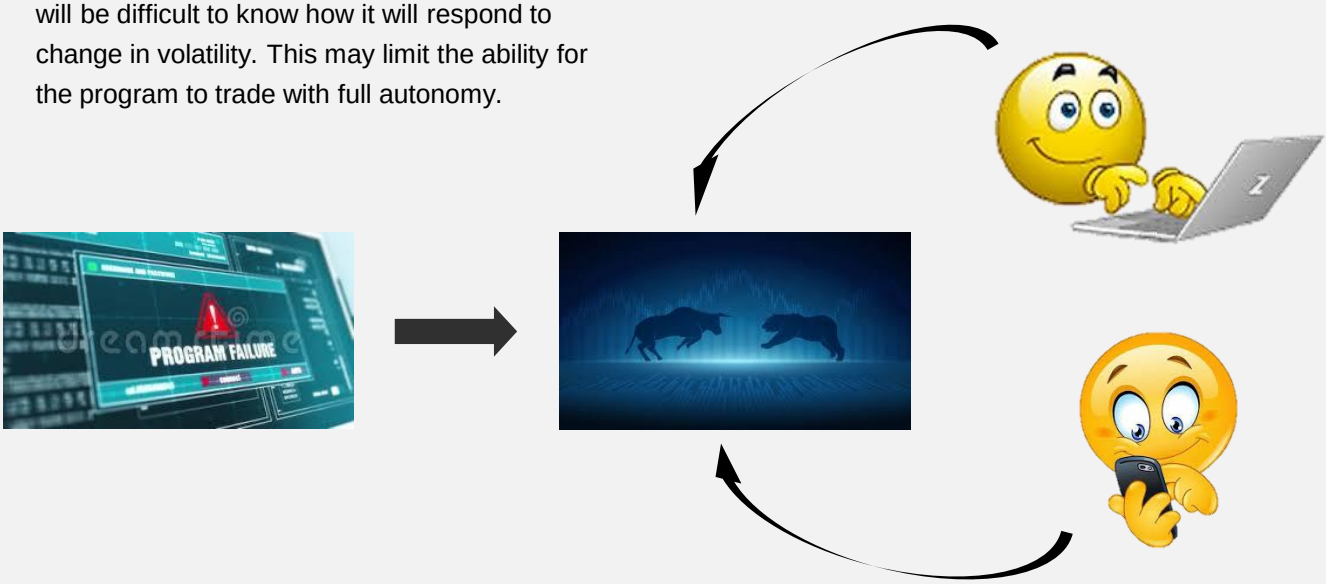
System Issues

Algorithmic trading systems require the need to rely on computer programs for order execution. The programs can range from an off the shelf system, to a simple analysis and price trigger to an extravagant machine learning system.

A machine learning system requires specialist programing skills which will make the development expensive and justifiable for large institutions.

Using an off the shelf system may be affordable, but the risk of it being a “black box” system means that in the absence of extensive testing, it will be difficult to know how it will respond to change in volatility. This may limit the ability for the program to trade with full autonomy.

The algorithmic trading system relies upon hardware to be operational during the execution of trades. Dedicated computers, servers and internet connections are required to facilitate proper function of the system. Intermittent outages in electricity and internet connectivity can compromise a given trade's execution. Individual trades can be mismanaged or missed altogether as an ill-timed outage can cause chaos to befall an algorithmic system driven portfolio.



Summary

Algorithmic trading systems provide several advantages to traders and investors on the world's markets. However, the technologies upon which the electronic marketplace is based are susceptible to failures, which lie outside of the control of the individual trader.

AGILIS CAPITIS – ABOUT US

"Just because we have identified a mispriced security does not mean that the market has."

Agilis Capitis is a specialist Australian equities manager that is focused on active management to generate alpha returns for its investors.

It uses a combination of technical algorithmic and fundamental analysis to:

- Identify mispriced securities; and
- Confirm the mispricing by analysing shifting market sentiment.

Using algorithmic strategies allows for the coverage of a greater number of securities, providing a faster reaction time while removing the emotion from decision making. It improves the timing and reduces the error rate.

"The market can remain irrational longer than you can remain solvent."

John Maynard Keynes

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