Limitations of Securities Traders in Adjusting Allocation Strategy Due to Time and Complexity Restraints

Traders work with large numbers of buy/sell contracts in addition to handling a complex pool of securities from which they can fill contracts. The Public Securities Association (PSA) rules place additional constraints on the problem of asset allocation. Most of these are forward contracts with a predetermined settlement deadline, and due to the PSA rules it is financially advantageous to fill as close to the deadline as possible. As a result there is a flurry of activity just before the deadlines as contracts are settled accompanied by rapid market shifts. A human operator cannot react to this new information and adjust their allocation strategy accordingly given the complexity and time constraints of the problem, resulting in lost profit opportunities.

Algorithm for Computerized Automation of Asset Allocation Using Stimulated Annealing and an X-Window Interface

The technology is an algorithm for computerized automation of asset allocation and contract reconciliation using simulated annealing and having an x-window interface. It uses a ‘greedy’ algorithm to fill contracts with security bundles which maximize profits or minimize losses by capitalizing on the flexibility afforded by PSA rules to slightly over or under fill the contract depending on whether the market price spread yields a loss or profit per share. Additionally the algorithm considers and optimizes allocation across multiple contracts, more completely utilizing the asset pool, resulting in higher volume and profitability. Assets are commonly reserved but not utilized to fill a particular order, the technology instantaneously returns unused assets to the pool for consideration and use. The system also takes advantage of real-time data to adjust to the dynamic fluctuations that occur as contract deadlines approach.

Applications:

• A computer assisted, or even fully automated trading desk where the limitations of human response time and parallel optimization are eliminated
• A so called toy system for trading firms to simulate/test novel trading strategies prior to implementation

Advantages:

• The technology can bundle assets quicker and more efficiently than a human trader, increasing trade volume while also increasing the profitability of each deal
• Cuts down on personnel costs as fewer traders are needed
• Enables real-time response to market fluctuations due to the high trading volume near deadlines, capturing lost profit by acting on more accurate information
• When allocated assets go unused they can be immediately reintroduced to the securities pool for consideration, allowing them to be effectively utilized elsewhere

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