

13. ALTERNATIVE TRADING SYSTEMS

13.1 Introduction

The term “alternative trading system” encompasses four general sorts of mechanisms.

- ▶ Derivative markets
- ▶ Crossing markets
- ▶ Continuous ATSS

The legal framework for these markets is contained in:

13.2 SEC “Reg ATS”

Formal title: Regulation of Exchanges and Alternative Trading Systems

Enacted (after much debate) in December, 1998

Prior to the rule, anyone who wanted to set up a securities market either

- ▶ had to become an exchange (extremely difficult), or
- ▶ get the SEC to issue a “No action” letter
A guarantee that the SEC would not prosecute the operators of the new market

Effectively, market structure decisions were being made case-by-case

Reg ATS established

- ▶ A broad regulatory framework.
- ▶ Conditions under which a new market could start up with minimal regulation.

Definition of an ATS (from the rule)

Alternative trading system means any organization, association, person, group of persons, or system:

That constitutes, maintains, or provides a market place or facilities for bringing together purchasers and sellers of securities or for otherwise performing with respect to securities the functions commonly performed by a stock exchange ...;

This part is extremely broad: “bringing together” covers many diverse aspects of the brokerage business. Other provisions and interpretations impose or imply restrictions in the scope of the rule.

[An ATS] does not:

Set rules governing the conduct of subscribers other than the conduct of such subscribers' trading on such organization, association, person, group of persons, or system; or

Set rules governing the conduct of subscribers other than the conduct of such subscribers' trading on such organization, association, person, group of persons, or system; or

Discipline subscribers other than by exclusion from trading.

These provisions exclude the NYSE, Nasdaq, etc.

The most important provision is:

A new market can register as

- ▶ an exchange (heavy regulatory burden); or
- ▶ a broker-dealer

If the new market registers as a broker-dealer ...

... a system with less than five percent of the trading volume in all securities it trades is required only to: (1) file with the Commission a notice of operation and quarterly reports; (2) maintain records, including an audit trail of transactions; and (3) refrain from using the words "exchange," "stock market," or similar terms in its name.

This last provision led to the introduction of many new trading systems.

Who/what are the ATs?

All of the ECNs are ATs

But there are many non-ECN ATs

Non-ECN ATs are generally electronic, institutional markets. They include:

- ▶ NYSE crossing sessions

- ▶ Instinet (besides its ECN) also runs Global and VWAP crossing markets.
- ▶ Posit (ITG, Inc.)
- ▶ LiquidNet
- ▶ Tri-Act (ITG, Inc.)
- ▶ NYFIX Millennium

Not all of the newly-introduced ATSS were successful. Defunct venues include the Arizona Stock Exchange and Optimark.

It is worth emphasizing that both of these ventures were well-capitalized efforts organized by seasoned brokers and traders.

Digression: Derivative pricing and derivative markets

With derivative pricing, the price at which trades take place is determined by the price in some other market (the primary market).

A derivative market is one that relies almost exclusively on derivative pricing.

All markets take into account to some extent the prices at other markets.

In many systems, the midpoint of the NBBO prevailing at the time of the trade sets the price.

Derivative markets depend crucially on the integrity (reliability, absence of manipulation) of the price in the primary market.

Note: A derivative security (option, futures contract, etc.) is priced off of the underlying security. Sometimes the term “derivative market” refers to a market for derivative securities.

13.3 Crossing markets/networks

Overview

In a crossing market, traders submit directions (buy or sell) and quantities, but no prices.

There orders are submitted electronically and are not externally visible.

Prices are determined by taking another market price as a reference.

Sometimes this price is determined prior to the match; sometimes after.

Crossing markets are sometimes called “zero impact” trades.

There is symmetry between the buyer and seller.

Nobody hits/lifts someone else’s bid/ask.

NYSE Crossing Sessions

Crossing Session I

Crossing Session I operates between 4:15 and 5:00 p.m. (EST).

It enables members to enter one-sided, two-sided, or good-til-executed orders for a particular stock into the SuperDot system for execution at 5:00 p.m.

Matched orders are executed at the NYSE closing price determined during the Exchange's 9:30 a.m. to 4:00 p.m. trading session and are printed on the consolidated tape.

Average 2001 volume: approx 3 MM sh/day (fact book)

Avg total NYSE volume: 1,240 MM sh/day.

Crossing Session II

Crossing Session II operates between 4:00 p.m. and 5:15 p.m. (EST).

This session is designed to facilitate trading of baskets of at least 15 NYSE securities valued at \$1 million or more.

Members that have either facilitated a basket trade, or have paired two customers' baskets, submit aggregate information to the Exchange for execution.

At 5:15 p.m., the NYSE prints the aggregate information of all baskets executed in this session to the consolidated tape. On the third day after trade date (T+3), the individual component stocks executed as part of a basket trade are printed in aggregate form in the NYSE Daily Sales Report.

Avg 2001 volume: 21 MM sh/day

Crossing sessions III and IV

The NYSE has requested (and the SEC has granted) approval for two additional crossing sessions.

Trades in these sessions will arise between brokers and their institutional clients in connection with certain guaranteed-price orders.

Order strategy in crossing markets using previously determined prices

NYSE Crossing Session I: Orders accepted at 4:15. Cross operates between 4:15 and 5pm.

Suppose the trading desk for ABC mutual fund follows the strategy of sweeping all unfilled orders into the session at 4:15, and checking at 5pm to see if anything was done.

Example: the closing price of KO was 56. ABC puts in an order to sell KO. If there's a match, ABC sells KO at 56.

Danger: KO makes a significant positive after-hours news announcement. It is clear that KO will open tomorrow substantially above 56. A smarter trading desk puts in an order (to the crossing session) to buy KO. ABC gets a (bad) fill.

If there's no announcement (or a negative one), ABC finds that it usually doesn't get a fill.

ABC tends to get filled when the market has moved against it.

(The winner's curse.)

There are relatively few one-sided orders in the cross.

Instinet Crossings

Comprises two principal crosses: End-of-day and VWAP (Volume-weighted average price)

Readings: Global crossing fact sheet; News policy

End-of-day cross

3:30 P.M.–6:30 P.M. EST, Instinet Crossing accepts and accumulates buy and sell orders for US equities from its clients worldwide.

6:30 P.M.–9:00 P.M.: The "matching" process begins by

- ▶ uploading closing price data,
- ▶ checking corporate actions,
- ▶ verifying order entry accuracy, and
- ▶ enforcing Instinet's News Policy (!)

At approximately 9:00 P.M.,

- ▶ Instinet Global Crossing executes one massive cross between all clients' orders.
- ▶ In the Cross, all trades are executed at the last sale for NYSE-listed equities and at the mid-point of the closing Nasdaq market on a next-day trade date basis.
- ▶ Where an order does not find a match in the Cross, it is returned "unexecuted" to the client.

Instinet's regulation

From the Global Crossing Fact Sheet:

Instinet ... monitors late-breaking news and client activity to provide a fair and level trading environment for all clients.

Excerpts from "Instinet Global Crossing News Policy"

Instinet requests that its clients refrain from entering orders in the affected securities into Instinet Global Crossing.

Instinet reserves the right not to trade any specific security at any time.

If Instinet determines that a client's trading style is reactive or event-driven, i.e., the client places an order to purchase or sell securities that may be impacted by, or in response to, information disseminated immediately before or after the close of the market, that client will be categorized as an "Event-Driven Client."

An "Event-Driven Client" will be able to trade only with other Event-Driven Clients and with those Passive Clients who choose to expose their orders to them.

Instinet reserves the right to suspend or terminate service to any client that Instinet, in its sole discretion, reasonably believes to be acting in a manner inconsistent with the Policy.

Instinet VWAP cross

VWAP is value-weighted average price [per share]
\$ Volume / Share Volume for the day.

Example: 1,000 shares @ 50; 2,000 @ 55; 1,000 @ 58.

$VWAP = (50,000 + 110,000 + 58,000) / 4,000 = 54.50$

Institutions often use it as a benchmark to evaluate their trading desks and brokers.

In the VWAP cross, buyers and sellers are matched before the start of the day's trading.

ITG's Posit

Buy and sell orders, including both individual stocks and portfolios, are entered into the system from many sources.

Fifteen times daily the main POSIT computer processes and compares all orders confidentially.

POSIT matches take place within a one minute window after the match times indicated above. You don't know exactly when the match will occur. This discourages manipulation.

POSIT trades are priced from the stock's primary market [not the NBBO] at the moment the match is run. Trades are matched at the midpoint of the bid/offer spread (the difference between the best seller's asking price and the best buyer's bid).

Those orders which match are automatically executed. Immediately after each match, clients receive electronic reports showing match results for their orders. Clients then decide whether to keep unmatched orders in the system for future matches or to execute them by other means.

13.4 Liquidnet

Buy and sell quantities are entered into the system anonymously.

If there is a match with a quantity already in the system, then buyer and seller are brought together anonymously.

Typically, agreement is quickly reached at the midpoint of the NBBO (Rubenstein Theorem from bargaining)

There is some quantity negotiation.

Each side sees a scorecard for the counterparty that summarizes how often the counterparty has successfully concluded negotiations.

This is to prevent someone from putting in an “order” that they have no intention of trading, just to see if there is interest on the other side.

13.5 “Pass-through markets”

Exemplified by ITG’s TriAct and Nyfix’s Millenium

These are a relatively new class of market mechanism.

Most traditional markets are “sticky”.

When an NYSE specialist receives an order, he will go to great lengths to avoid sending that order elsewhere.

TriAct, Millenium (and a few other markets) don’t position themselves as final destinations.

To institutions sending in market orders, they say, in effect, “Sending an order to the NYSE? Why not stop at our place first. You might get a better price.”

If we don’t have an immediate match for your order, we’ll forward it to the NYSE with no delay (or as close to “no delay” as systems allow).

NYFIX calls these “pass-through” orders

To institutions sending in limit orders, they say, “Why not post in our system. It’s invisible and anonymous. And, if you trade in our market, you’ll only be trading against our select clientele.”

13.6 Internalization

To this point, we've concentrated on:

- ▶ brokers (who act as agent for customer orders, representing these orders in some trading venue)
- ▶ dealers (who take the other side of customer orders)

Sometimes, brokers might have in their possession offsetting customer orders.

I.e., the broker might be able to form matched trades from the customer orders, and execute them at, say, the midpoint of the National best-bid-and-offer (NBBO)

When a broker pairs off his buyers and sellers and executes the trade, he is said to “internalizing” his order flow.

The alternative is sending all orders to the central market for execution.

It is generally cheaper to internalize orders. (The broker avoids the fees of the central market.)

But internalization means that

Fewer orders reach the central market.

There is less liquidity in the central market.

The central market price is more volatile and susceptible to manipulation.

A broker who internalizes order flow is acting somewhere between a traditional broker and a dealer.

He is representing customer orders. *But he's representing both sides of the trade.*

He doesn't take the other side of a customer trade (like a dealer would). *But customer orders never reach the central market for interaction.*

ATs like TriAct and Millenium partially internalize their customer order flow.

14. TRADING OBJECTIVES, COSTS AND STRATEGIES

14.1 Overview

Planning and evaluating trades

Objective: what are we trying to accomplish?

ex: “Buy 1,000 shares of INTL by today’s close.”

Strategies: what are the possible ways of meeting this objective?

ex: Immediate market buy order

(But there might be many other ways of accomplishing the goal.)

Costs: What measure (metric) do we use for evaluating strategies?

Viewed prospectively (looking ahead), costs are random (uncertain). There will be a risk-return trade-off.

Importance

While all investors are (or should be) concerned with trading costs, this material is most important for fund managers acting on behalf of someone else.

Mutual fund managers are responsible to the shareholders of the fund. (Investment Company Act of 1940)

Pension fund administrators are responsible to the pension beneficiaries (current and future retirees). (General agency law, specific Department of Labor regulations.)

When these agents make trading decisions, the costs come out of the shareholders’/beneficiaries’ pockets.

In the US, fund managers are generally viewed as being required to monitor trading costs.

Bundling and “soft dollars”

Sometimes trading services are bundled with other services (especially research). Normally:

Trading costs are borne by the fund beneficiaries (an offset to the fund's gross return).

Research costs are borne by the fund managers. The stated "management fee" is supposed to cover research.

When a service (like research) is bundled with commissions, it shifts expenses from the fund manager to the fund beneficiaries (in a very non-transparent fashion).

"Soft dollar" conventions establish an accounting and tracking scheme for all of this.

Example:

Broker *B* tells client *C*: "For every commission dollar you pay to us (in cash), we'll credit you with one soft dollar."

Broker *B* tells independent research firm *R*: "We'll let our clients buy your services with soft dollars. When client *C* pays you with soft dollars, we'll give you cash in exchange for them."

Bundling and soft dollars have always been controversial because of the potential for cost-shifting.

As a legal defense, managers assert that these arrangements do not result in higher trading costs. They must have analyses numbers to back this claim.

14.2 The implementation shortfall framework (Perold)

Suppose that we observe a portfolio's returns over time.

Can we decompose this "investment gains/losses" and "trading gains/losses"?

In practice, portfolio and trading decisions are linked.

Your return on an investment is determined by the purchase price and resale price *net of all commissions and irrespective of where the*

prices lie relative to then-prevalent “market prices”.

Trading objectives are often fuzzy. The trader needs to know how badly the portfolio manager needs the trade done (the cost of non-execution).

In the implementation shortfall approach, we assume a *separation* between investment and trading decisions.

“Long term” investment strategies are made by “portfolio managers”. They make clear decisions about what to buy, sell and hold.

These decisions are implemented by a trading desk.

We compare the performance of an actual portfolio (gain, loss or return) to the performance of a hypothetical paper portfolio in which all trades are made at notional (“benchmark”) prices. The cost is the difference.

E.g., If the return on the paper portfolio is 10% and the return on the actual portfolio is 9%, the implementation shortfall is 1%.

Interpretation: If we had a perfect trading desk, our trades could be executed at the notional prices. Any divergence must be attributed to trading (implementation) costs.

The framework tells us about costs at the portfolio level, but not about the costs of individual trades.

Often, though, the framework leads to an obvious cost measurement.

The bid-ask midpoint

A common benchmark price for trades is the midpoint of the bid and ask quotes prevailing at the time the decision was made to invest.

bid-ask midpoint = “BAM”

Other candidate benchmarks

- ▶ BAM subsequent to the trade
- ▶ average price for the day
- ▶ previous day’s closing price

Calculation of the implementation shortfall

I buy 100 shares of ABC. When I decide to buy the shares, the market is 50 bid, 51 offered. I actually buy at 51.20, paying a \$29 commission.

$$\text{Cash outflow} = 5,120 + 29 = 5,149$$

When I make the decision to sell, the market is 54 bid, 54.50 offered. I actually sell at 54, paying a \$29 commission.

$$\text{Cash inflow} = 5,400 - 29 = 5,371$$

My net cash flow is $5,371 - 5,149 = 222$. (A return of 4.31%)

In my paper portfolio, I buy and sell at the midpoint of the bid and ask quotes at the time I decide to trade.

$$\text{I buy 100 shares at 50.50 and sell at 54.25} = 375 \\ \text{(a 7.43\% return)}$$

The implementation shortfall is $375 - 222 = 153$ (ignoring interest on the cost)

Alternatively, the implementation shortfall is $7.43\% - 4.31\% = 3.12\%$

Explicit and implicit trading costs

Explicit cost: commission (net of any rebates of goods or services, “soft dollars”)

Implicit cost: the cost of interacting with the market.

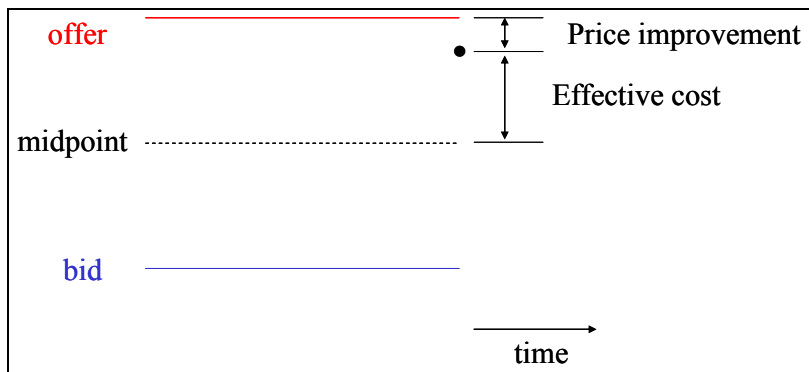
The initial purchase was made \$0.70/sh above the BAM, so the implicit cost = \$70

The final sale was made \$0.25/sh below the BAM, so the implicit cost = \$25

The implicit cost computed with respect to the BAM is sometimes called the *effective cost*.

The effective cost is a useful measure for market orders.

The effective cost for a buy order ...



Effective spread = 2 x effective cost

For the initial purchase, the effective spread = 2 x
\$0.70 = \$1.40 / share.

Intuition

The quoted (posted) spread is $51 - 50 = 1$.

If a buyer pays \$0.70 above the BAM and sells
\$0.70 below the BAM, they are effectively facing a
spread of \$1.40.

14.3 The effective spread and rule 11ac1-5

SEC rules 11ac1-5 and 11ac1-6 comprise the
“Disclosure of order execution and routing
practices” rule (effective January 30, 2001)

11ac1-5 requires market centers to compute
effective spreads for covered orders and report them
electronically (broken down by size of trade, etc.)

11ac1-6 requires brokers to disclose relationships
that involve receiving money in exchange for
sending customer orders to a particular destination.

Terms in rule 11ac1-5

Market center: a venue for executing trades

OTC market maker [e.g., Goldman Sachs
making a market in MSFT]

national securities exchange [e.g. NYSE]

national securities association [Nasdaq]

etc.

Covered orders

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Market orders

Marketable limit orders

Definition of effective spread (rule 11ac1-5)

The term average effective spread shall mean the share-weighted average of effective spreads for order executions calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the *consolidated best bid and offer at the time of order receipt* and, for sell orders, as double the amount of difference between the midpoint of the consolidated best bid and offer at the time of order receipt and the execution price.

A typical Nasdaq report (SuperMontage, MSFT, orders of 100-499 shares):

SEC Rule 11Ac1-5: Disclosure of Order Execution Information
 Market Center: NASDAQ
 Issue: MSFT - Microsoft Corporation - Common Stock
 Report Type: Comprehensive - February 2004
 Execution System: SuperMontage
 Order Size: 100-499 Shares

Order Type	Number of Orders	Number of Shares	Canceled Shares	MC Exec. Shares	Other MC Exec. Shares	0-9 Seconds	10-29 Seconds	30-59 Seconds	60-299 Seconds	5-30 Minutes
Market orders	764	87,049		87,049		87,049				
Marketable limit orders	61,633	12,383,698	5,114,444	7,269,254		7,017,307	157,725	52,548	39,624	2,050
Inside-theQuote limit orders	58	12,301	7,925	4,376		4,376				
At-the-Quote limit orders	236,998	54,728,369	51,919,314	2,809,055		1,493,807	642,063	302,672	320,483	43,875
Near-the-Quote limit orders	199,736	47,603,573	45,823,579	1,779,994		336,823	367,634	234,001	544,494	206,887

Order Type	Avg. Realized Spread	Avg. Effective Spread	Price Improved Exec. Shares	Avg. Price Improvement Amount	Price Improved Avg. Exec. Time	At Quote Exec. Shares	At Quote Avg. Exec. Time	Outside of Quote Exec. Shares	Avg. Outside of Quote Amount	Outside of Quote Avg. Exec. Time
Market orders	\$0.0188	\$0.0094				80,709	0	6,340	\$0.0100	0.1
Marketable limit orders	\$0.0060	\$0.0036	11,644	\$0.0110	0.1	7,038,137	1.7	219,473	\$0.0103	0.1
Inside-theQuote limit orders	\$0.0543									
At-the-Quote limit orders	-\$0.0002									
Near-the-Quote limit orders	-\$0.0073									

The statistics do not reflect all trading in MSFT.

If Goldman acts as a dealer, taking the other side of a customer order, and reporting the trade, this would normally be reported in Goldman's 11ac1-5 statistics (on Goldman's web site, not Nasdaq's)

Things to note:

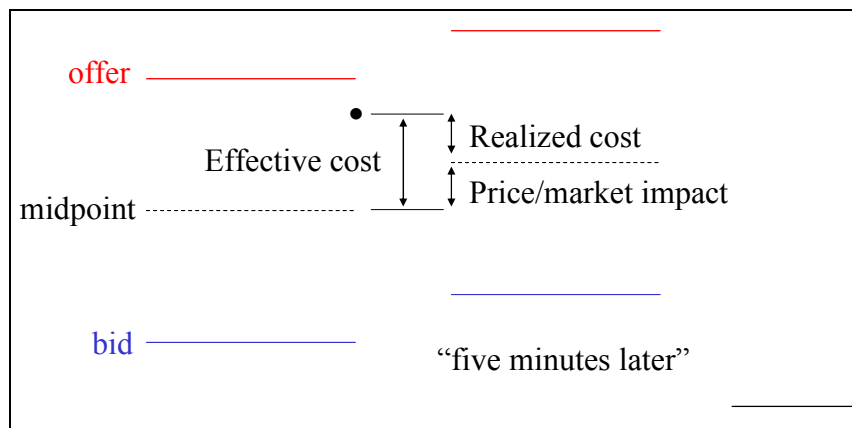
- ▶ Most "market" orders are really marketable limit orders (i.e., they are priced)
- ▶ The average effective spread for these orders is 0.36 cents.
- ▶ There are an enormous number of limit orders priced inside, at or near the quote. Most of these are canceled.

14.4 Realized cost and realized spread

For executed trades, the realized cost is the transaction price relative to the BAM at some time subsequent to the trade.

This impounds price movements after the trade (including the price impact due to the information in the trade).

Analysis of a buy order



An interpretation of the realized cost

This cost can be interpreted as the profit realized by the other (contra) side of the trade, assuming the contra side could lay off the position at the new BAM.

Example:

The dealer sells to the customer at 100.09.

Five minutes later, the market is bid 100.02, 100.12 offered (BAM = $(100.02+100.12)/2 = 100.07$.)

The realized cost is 0.02

This would be the dealer's profit if he could reverse the trade (purchase the stock) at the subsequent BAM.

The realized spread (Rule 11ac1-5 definition)

The term average realized spread shall mean the share-weighted average of realized spreads for order executions calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the consolidated best bid and offer five minutes after the time of order execution and, for sell orders, as double the amount of difference between the midpoint of the consolidated best bid and offer five minutes after the time of order execution and the execution price; provided, however, that the midpoint of the final consolidated best bid and offer disseminated for regular trading hours shall be used to calculate a realized spread if it is disseminated less than five minutes after the time of order execution.

MSFT SuperMontage statistics (revisited)

realized spread = effective spread – price impact

Since price impact is normally positive, we expect

realized spread < effective spread

MSFT:

rlzd sp (0.0060) > eff sp (0.0036)

This is puzzling. (Statistical sampling error?)

A less-frequently traded stock (PIXR):

You can modify your report by changing any of the criteria below, or to request a new report click [here](#).

Exec. System:	Month:	Issue Symbol:	Report Type:	<input checked="" type="radio"/> Order Size	<input type="radio"/> Order Type	
NASDAQ-Listed	February 2004	PIXR	Comprehensive	100-499 Shares		View

SEC Rule 11Ac1-5: Disclosure of Order Execution Information
 Market Center: NASDAQ
 Issue: PIXR - Pixar - Common Stock
 Report Type: Comprehensive - February 2004
 Execution System: NASDAQ Market Center NASDAQ-Listed Trading
 Order Size: 100-499 Shares

Order Type	Number of Orders	Number of Shares	Canceled Shares	MC Exec. Shares	Other MC Exec. Shares	0-9 Seconds	10-29 Seconds	30-59 Seconds	60-299 Seconds	5-30 Minutes
Market orders	142	21,375		21,375		21,375				
Marketable limit orders	5,891	912,810	211,954	700,856		699,792	236	142	486	200
Inside-theQuote limit orders	6,689	1,097,475	785,158	312,317		307,389	1,825	1,696	1,207	200
At-the-Quote limit orders	5,228	670,003	478,711	191,292		126,808	25,025	16,056	19,385	3,618
Near-the-Quote limit orders	36,036	5,919,030	5,805,979	113,051		59,444	13,251	10,579	19,598	8,970

Order Type	Avg. Realized Spread	Avg. Effective Spread	Price Improved Exec. Shares	Avg. Price Improvement Amount	Price Improved Avg. Exec. Time	At Quote Exec. Shares	At Quote Avg. Exec. Time	Outside of Quote Exec. Shares	Avg. Outside of Quote Amount	Outside of Quote Avg. Exec. Time
Market orders	\$0.4529	\$0.0778	5,362	\$0.0332	0.1	11,122	0.1	4,891	\$0.0375	0.1
Marketable limit orders	\$0.0110	\$0.0449	31,199	\$0.0252	0.1	592,837	0.4	76,820	\$0.0293	0.2
Inside-theQuote limit orders	-\$0.0198									
At-the-Quote limit orders	-\$0.0331									
Near-the-Quote limit orders	-\$0.0935									

14.5 The effective cost of a sequence of market orders

Often traders break up large orders into smaller ones, and feed them to the market over time.

In a sequence of orders, the cumulative price impact means that later orders will trade at worse prices than early ones.

For a buy sequence, the effective cost is:

$$\text{volume wtd average purchase price} - \text{BAM prevailing at time of trading decision}$$

Ex: Suppose the BAM is 10.00. We buy 100 shares at 100.10, 500 shares at 100.25 and 400 shares at 100.50.

The vol wtd average purchase price is 100.335/share.

The effective cost is \$0.335 per share.

Breaking up orders is typically cheaper

Suppose the BAM = \$10.00. We want to buy 1,000 shares.

The effective cost of one 1,000 share order is \$0.30/sh

If we split the order into two successive 500 share trades, we pay

$$\begin{aligned} & 500 \times (\$10.00 + \$0.20) + \\ & \quad 500 \times (\$10.00 + \$0.05 + \$0.20) \\ & = 500 \times \$10.20 + 500 \times (\$10.05 + \$0.20) \\ & = \$5,100 + \$5,125 = \$10,225 \end{aligned}$$

Relative to the initial midpoint, the trading cost is 225 (\$0.225/sh)

14.6 Measuring market impact

Statistical tools from time series analysis attempt to correlate orders with subsequent price movements.

General considerations.

- ▶ Market impact is not the same for all orders in all markets.
- ▶ Large orders have higher impact than smaller orders.
- ▶ Orders perceived as originating from “smart” traders will have high impact.
- ▶ Orders that execute in markets that cater to retail investors will have low impact.

14.7 Measuring the cost of limit orders

For a single limit orders there are no summary measures comparable to effective and realized spreads.

Market orders always execute. The only issue is price.

Limit orders often don't execute.

How should we account for ...

- ▶ an order that wasn't filled?
- ▶ a delayed execution?

It is possible to measure the effective cost of strategies that use limit orders if the strategy ensures an (eventual) execution.

The first-limit-then-market strategy

Situation: the trader must fill an order by some pre-set time (like the close of trading).

Strategy

First use limit orders at (or away from the market).

If a limit order doesn't execute within some pre-set time, replace it with a more aggressively priced order.

Repeat.

If no limit orders have been filled by the end of the day, switch to a market order.

Example: It's 10am. I have to buy 100 shares by today's close. The market is 20.50 bid 0.60 offered.

I put in a buy limit order at 20.50.

If the order hasn't executed in 30 minutes, I'll cancel and replace with a buy limit order priced at 20.51, etc.

If no fill by the close, I'll cancel the limit order and submit a market order.

14.8 Cross-market comparisons

11ac1-5: All market centers must report effective and realized costs.

The computations are difficult. Some orders fall in grey areas.

The computations aren't audited.

Each market reports electronically on its own web site.

There is no one place where you can get a consolidated report.

15. DICTIONARY OF ACRONYMS

FIX	Financial Information eXchange. A computer protocol for transmitting orders, etc.
CMS	Common Message Switch. The NYSE's point of contact for order information.
ECN	Electronic Communications Network
OHR	SEC's Order Handling Rules.
ATS	Alternative Trading System

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