

What?

Big Picture

Small Picture

Reg NMS

Fragmentation

Execution  
Management

Implications

# Liquidity and Asset Management

Christopher G. Lamoureux

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## What?

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## Implications

- ▶ Assets differ from one another along dimensions of systematic risk and expected return. This motivates modern investment analysis. But they also differ along the dimension of liquidity. The rise of the alternative asset category highlights the importance of seeking value in less liquid places.
- ▶ In fact, the very structure of hedge funds, private equity funds, VC funds, and infrastructure funds, as well as “direct investment” vehicles for asset managers attests to the importance of liquidity.

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- ▶ Consider the first great hedge fund *Long Term Capital Management*. A key to its tremendous (early) success was the lock-up provision. Investors in LTCM committed to not withdraw any funds for 3 years, and after that withdrawals are severely restricted.
  - ▶ In a sense this removes the liquidity “free-rider” problem that mutual funds face. A long-term investor in a mutual fund loses money over time because the fund:
    - ▶ incurs transactions costs as other investors enter and leave.
    - ▶ is forced to hold cash and more liquid assets (than it would otherwise) to respond to unexpected investor redemptions.
  - ▶ VC, PE, Infrastructure funds shift the liquidity burden onto the investors, who make a 10-year commitment which is subject to drawdown.

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- ▶ A university endowment is unique in the landscape of money management because of the fact that its cash needs are entirely predictable. This fact should affect the investment policy.
- ▶ Investors value liquidity as it allows them to respond to unexpected cash needs.
- ▶ An endowment should never accept a lower expected rate of return in exchange for liquidity.
- ▶ Endowments might consider selling liquidity.

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- ▶ For example, Harvard's \$37 billion endowment has only 11% in US equities.
- ▶ **Warning:** This maxim does not necessarily imply that the funds should be handed over to outside managers with multi-year lock up periods.
- ▶ –Why?
  - ▶ –Subject to coordination problem (i.e., bank runs), which highlights an aspect of liquidity risk.
  - ▶ –Agency problems (“solved” by lucrative performance fees).
- ▶ What it does mean: *Diversified, Direct Investment* in traditionally illiquid assets.
- ▶ Don't pay for liquidity that you don't need.

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- ▶ Drilling down into what liquidity means in relatively liquid financial securities brings us into the realm of market microstructure —the study of how transactions take place.
- ▶ It has descriptive and prescriptive aspects.
- ▶ An asset manager should manage and minimize execution costs.
  - ▶ Bid-Ask Spread
  - ▶ Price impact / front-running (bagging)
  - ▶ Commissions
- ▶ And maximize collateral value (Securities lending: repo specials).

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- ▶ Reg NMS promulgated in 2007.
- ▶ Desire was to prevent old physical exchanges from holding back US markets from innovating and competing globally.
- ▶ Creates the concept of National Best Bid and Offer (NBBO) and the requirement that a small market order execute immediately at NBBO.

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**Fragmentation**

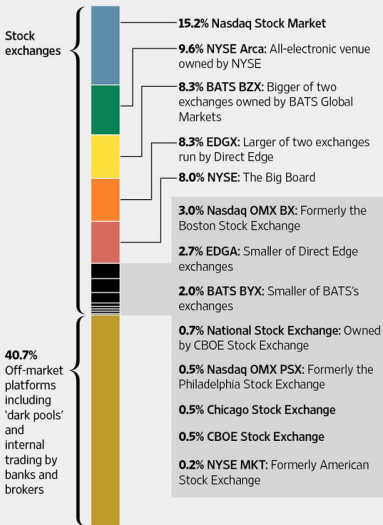
Execution Management

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## Trading Places

The business of filling U.S. stock orders has grown increasingly dispersed in the recent years.

Share of the market among U.S. stock trading venues in January\*



\*As of Jan. 27. Note: Numbers don't add up to 100% due to rounding.



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- ▶ Preceding slide from 2014. Some consolidation since:
  - ▶ Equity markets: [▶ Link](#)
  - ▶ Options: [▶ Link](#)
- ▶ Technology :: High Frequency Trading (Really: High Frequency Quoting – fishing.)
  - ▶ Algorithmic Trading (now > 70%) of total volume.
- ▶ Fragmentation:
  - ▶ Dark Pools (13.5% of US volume).
  - ▶ Electronic Trading Networks.
- ▶ Competition amongst Exchanges: Maker-Taker: rebate to liquidity providers / charge access fee to liquidity takers.

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## EU's European Securities and Markets Authority:

### ▶ Markets in Financial Instruments Directive II:

- ▶ "Double Volume Cap:"
- ▶ Designed to limit dark pool activity in a given stock:
- ▶ Requires dark pools to suspend trading in a stock when more than 8% of the trading was in dark pools over the past 12 months.

### ▶ Rationale:

- ▶ *Price Discovery* is a public good – traditionally protected by monopoly franchises.
  - ▶ Anecdote about fish market whiting out its window.

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Example from Jan 27, 2014 *WSJ*: T. Rowe Price asked a broker to buy 2.5 million shares of an actively traded stock, and they tracked the broker's actions. "To hide the purchase from fast-moving traders, the broker placed and canceled many smaller orders all across the stock market, creating a dense smoke screen of phantom interest in the security. In total, the broker offered to buy 750 million shares of the stock while actually purchasing just 2.5 million."

Similar experiment by Invesco for a 1,000 share order: This order "traversed 10 separate exchanges and dark pools before it was filled. The order had also been sent to eight other venues where ultimately no shares were bought but where other traders may have had a chance to catch wind of Invesco's strategy."

# VAP: ITT 4/5/2018

ITT US \$ ↓ 50.58 +1.26  N50.57 / 50.58N 30x5  
 At 20:04 d Vol 577,326 0 49.78N H 50.77N L 49.57T Val 29.104M

ITT US Equity 98 Actions 99 Settings Price and Volume Dashboard

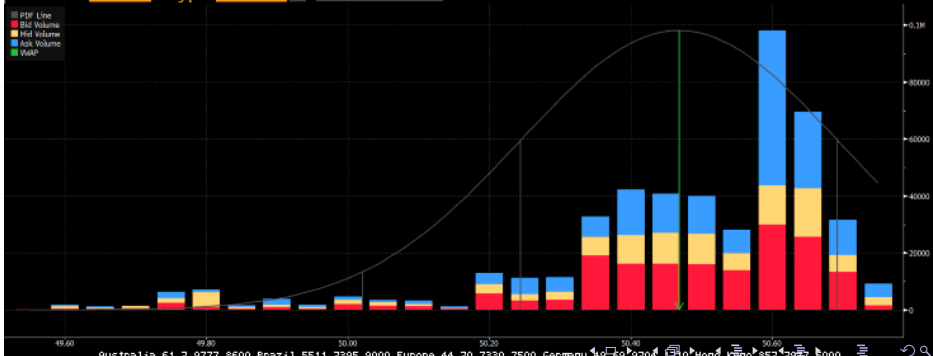
09:30 04/05/18 Price Filter Calculation Bloomberg Definition  
 16:03 04/05/18 Vol Filter Amount @ Part%

| Calculation | WVAP    | Volume  | Value Traded | Trades | Avg Size | Std Dev  |
|-------------|---------|---------|--------------|--------|----------|----------|
| Bloomberg   | 50.4686 | 466,346 | 23.536MLN    | 3,215  | 145      | 0.223971 |
| Custom      | 50.4686 | 466,346 | 23.536MLN    | 3,215  | 145      | 0.223971 |

1) Summary 2) Top Trades (AQR) 3) Volume at Price (VAP) 4) Trade Summary Matrix (TSM)

1) By Trade Side 1) By Exchange

Interval 0.05 Type Volume 2) Charts



# Volume by Exchange:

| ITT US Equity                                                                                  |          | 98) Actions  | 99) Settings | Price and Volume Dashboard |            |          |          |
|------------------------------------------------------------------------------------------------|----------|--------------|--------------|----------------------------|------------|----------|----------|
| 09:30                                                                                          | 04/05/18 | Price Filter | Calculation  | Bloomberg                  | Definition |          |          |
| 16:03                                                                                          | 04/05/18 | Vol Filter   | Amount       | @                          | Part%      |          |          |
| Calculation                                                                                    |          | WVAP         | Volume       | Value Traded               | Trades     | Avg Size | Std Dev  |
| Bloomberg                                                                                      | d        | 50.4686      | 466,346      | 23.536MLN                  | 3,215      | 145      | 0.223971 |
| Custom                                                                                         | d        | 50.4686      | 466,346      | 23.536MLN                  | 3,215      | 145      | 0.223971 |
| 1) Summary    2) Top Trades (AQR)    3) Volume at Price (VAP)    4) Trade Summary Matrix (TSM) |          |              |              |                            |            |          |          |
| 10) Market Overview    11) By Trade Side <b>12) By Exchange</b>                                |          |              |              |                            |            |          |          |
| <b>2) Charts</b>                                                                               |          |              |              |                            |            |          |          |
| Breakdown                                                                                      |          | WVAP         | Volume       | Value Traded               | Trades     | Avg Size | Std Dev  |
| UN: New York                                                                                   | d        | 50.4831      | 195,778      | 9.883MLN                   | 914        | 214      | 0.213368 |
| UT: NASDAQ InterMarket                                                                         | d        | 50.4599      | 110,469      | 5.574MLN                   | 905        | 122      | 0.212549 |
| UD: FINRA ADF                                                                                  | d        | 50.4530      | 59,328       | 2.993MLN                   | 437        | 136      | 0.243733 |
| UP: NYSE Arca                                                                                  | d        | 50.4376      | 28,198       | 1.422MLN                   | 267        | 106      | 0.267263 |
| UF: BATS                                                                                       | d        | 50.4730      | 19,339       | 976,097.412                | 181        | 107      | 0.196611 |
| UB: NASDAQ OMX BX                                                                              | d        | 50.4724      | 17,364       | 876,402.639                | 171        | 102      | 0.237877 |
| VK: EDGX                                                                                       | d        | 50.4190      | 14,273       | 719,630.511                | 132        | 108      | 0.250266 |
| VY: BATS Y                                                                                     | d        | 50.4964      | 9,286        | 468,909.19                 | 90         | 103      | 0.248898 |
| VF: Investors Exchange                                                                         | d        | 50.4531      | 9,213        | 464,824.71                 | 88         | 105      | 0.236902 |
| VJ: EDGA                                                                                       | d        | 50.5734      | 2,898        | 146,561.759                | 28         | 104      | 0.143410 |
| UA: NYSE American                                                                              | d        | 50.6300      | 100          | 5,063                      | 1          | 100      | 0.000000 |
| UX: NASDAQ OMX PSX                                                                             | d        | 50.6800      | 100          | 5,068                      | 1          | 100      | 0.000000 |

# Top Trades

ITT US \$ ↓ 50.58 +1.26  N50.57 / 50.58N 30x5  
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ITT US Equity 98 Actions 99 Settings Page 1/2 Price and Volume Dashboard

09:30 04/05/18 Price Filter Calculation Bloomberg Definition

16:03 04/05/18 Vol Filter Amount @ Part%

Calculation VWAP Volume Value Traded Trades Avg Size Std Dev

Bloomberg d 50.4686 466,346 23.536MLN 3,215 145 0.223971

Custom d 50.4686 466,346 23.536MLN 3,215 145 0.223971

1 Summary 2 Top Trades (AQR) 3 Volume at Price (VAP) 4 Trade Summary Matrix (TSM)

Trades with the Largest Impact Spread / Price Ratio .000198

| Date  | Time     | Volume | Price   | Exch | Date  | Time     | Volume | Price   | Exch |
|-------|----------|--------|---------|------|-------|----------|--------|---------|------|
| 04/05 | 16:02:02 | 31,924 | 50.58   | N    | 04/05 | 13:25:42 | 700    | 50.20 ↑ | D    |
|       | 16:02:58 | 3,700  | 50.58   | D    |       | 15:59:40 | 636    | 50.61   | N    |
|       | 09:30:00 | 3,681  | 49.78 ↑ | N    |       | 15:44:44 | 600    | 50.60   | N    |
|       | 16:02:05 | 2,893  | 50.58   | D    |       | 15:58:20 | 598    | 50.61   | N    |
|       | 15:59:42 | 1,600  | 50.66 ↑ | N    |       | 10:45:00 | 600    | 50.00   | K    |
|       | 15:58:40 | 1,542  | 50.62 ↑ | N    |       | 15:32:25 | 588    | 50.58   | T    |
|       | 15:59:58 | 1,400  | 50.58   | N    |       | 12:14:27 | 567    | 50.46   | N    |
|       | 15:58:44 | 1,000  | 50.63 ↑ | N    |       | 15:57:20 | 510    | 50.62   | N    |
|       | 15:41:07 | 900    | 50.50   | N    |       | 12:41:16 | 511    | 50.45   | N    |
|       | 15:50:14 | 871    | 50.69 ↑ | N    |       | 15:21:59 | 500    | 50.70   | N    |
|       | 15:58:54 | 800    | 50.64 ↑ | N    |       | 15:15:15 | 500    | 50.70   | N    |
|       | 15:59:42 | 800    | 50.63 ↑ | N    |       | 15:54:18 | 500    | 50.68   | T    |
|       | 14:53:33 | 794    | 50.67   | N    |       | 15:21:59 | 500    | 50.67 ↓ | N    |
|       | 15:00:56 | 700    | 50.76   | N    |       | 15:59:41 | 500    | 50.61 ↓ | N    |

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- ▶ Understand where you are on the liquidity spectrum:
  - ▶ Mutual Fund is one extreme – it needs liquidity as funds may be withdrawn at random.
  - ▶ University Endowment is other extreme.
- ▶ **And maximize accordingly!**
- ▶ Make trading costs *and execution* a point of distinction.
  - ▶ *Measure* both—and benchmark.
  - ▶ Don't give away order flow information.
  - ▶ Possible value in relationships.
- ▶ Recognize the effects of the new environment:
  - ▶ Heightened volatility :: **Reconsider** Limit / Stop Orders.
  - ▶ Black Pools *seem* an ideal venue—but are they subject to manipulation? Subject to growing regulation.