



Latest Trends of Global Equity Trading:

The New Technology, the Players, and the New Legislation;

Differences Between the US and the Rest of the World

Dr. Stavros Siokos



- What can be learnt from the US
- Current European landscape
- Practical implications for a dealing desk
- Broker solution to a post MiFID environment

US

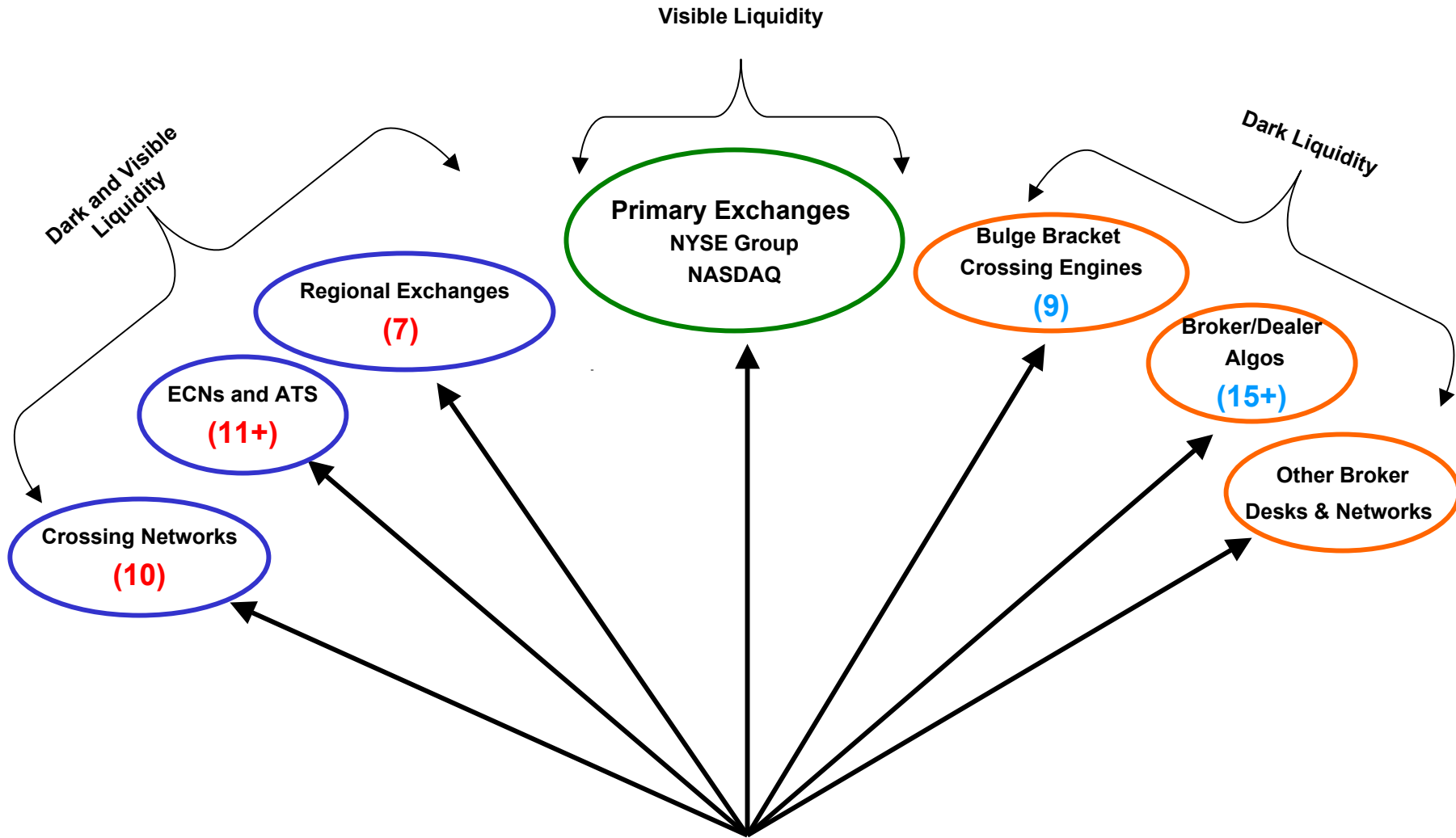
- The US highlights many similarities to Europe
- Regulation driven market change
- Competitive Opportunities

- An SEC Mandate
- Largest Market Structure Change in 30 Years
- More Fragmentation (BATS, Regional Exchanges, EDGX, TRAC, FLOW)
- More Consolidation (NYSE/ARCA, NASDAQ/INET/BRUT)
- New Market Data Revenue Distribution reward posting/adding liquidity

Key NMS Drivers

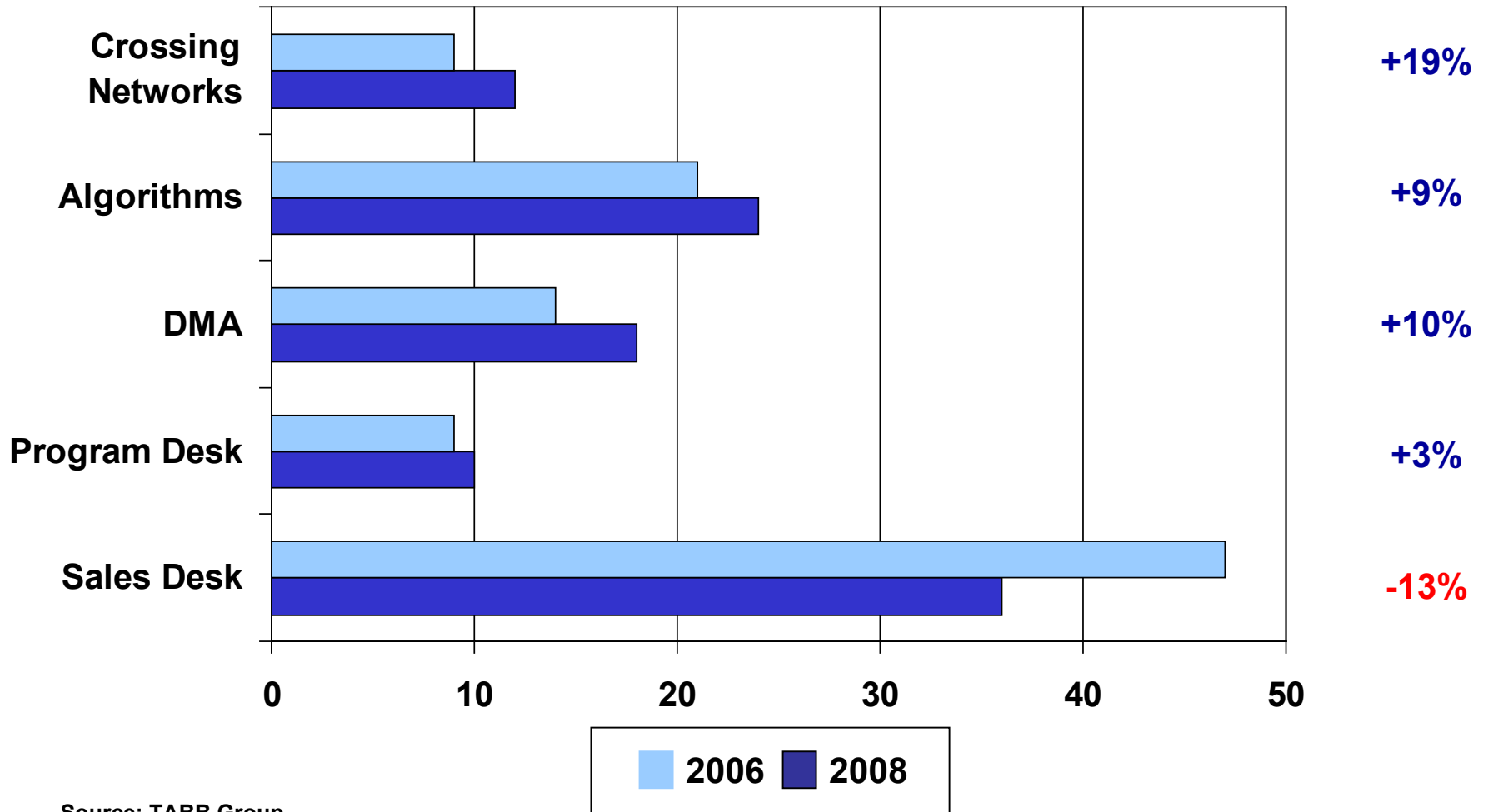
- Harmonisation of listed and OTC markets
- Order Handling Rules of 1996/Rise of ECNs
- Decimalization
- Slow Markets Frustrating Trends Toward Electronic Execution
- Algorithms

US Example of Market Fragmentation



Percent Traded via Execution Venues (shares)

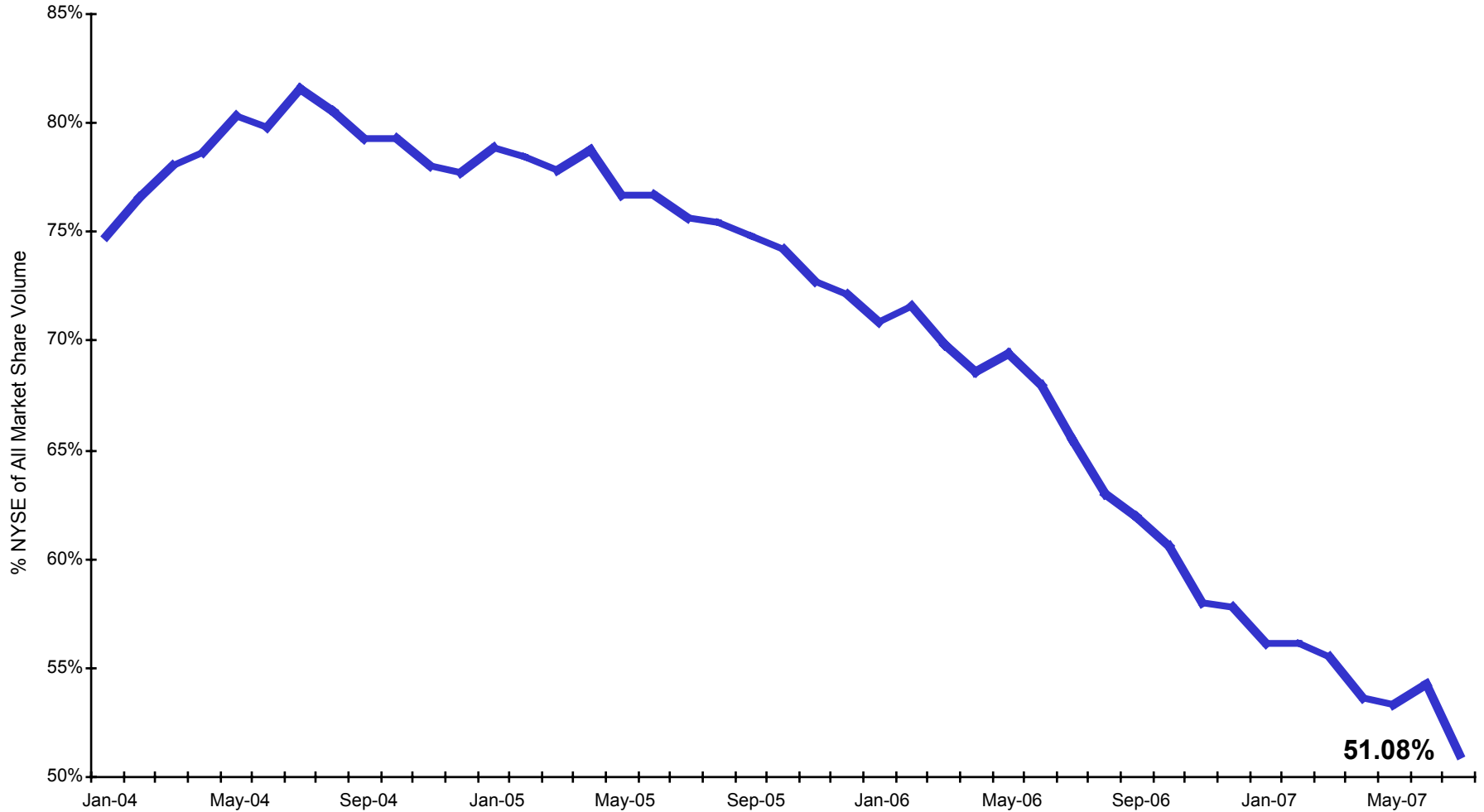
CAGR



Source: TABB Group

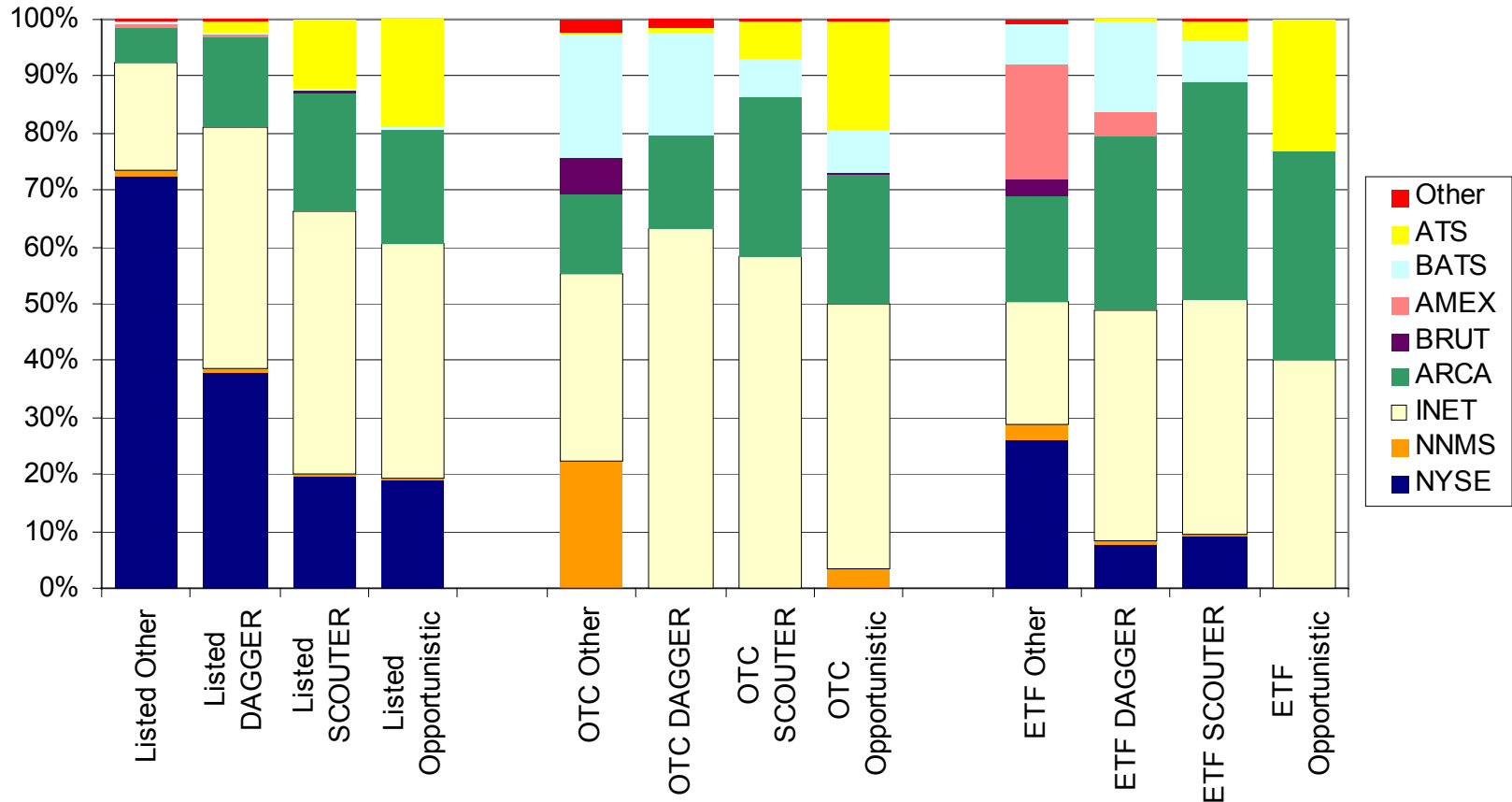


NYSE Share Volume in NYSE-Listed Securities



Data through Jan, 2007. Data represents percentage of total share volume reported to the consolidated tape.
Source: NASDAQ Market Center Trade Reporting, CTA Tape A Data

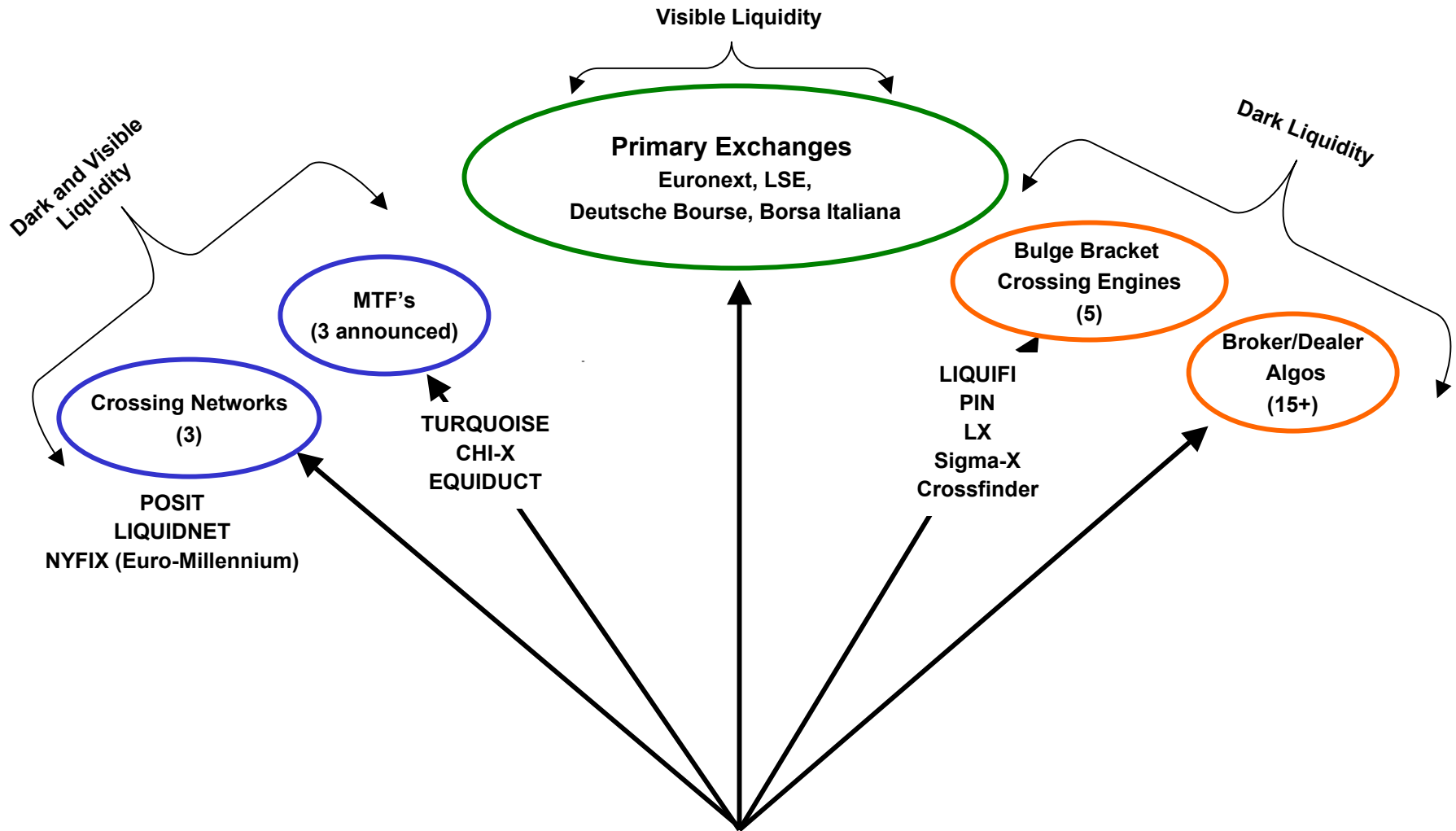
Flow Per Venue – US Algorithms



Citigroup delivers innovative aggregation of liquidity:

- **LIQUIFI –The Citi Crossing Network**
 - Direct, anonymous access to Retail, Institutional, and Proprietary order flow
 - A true dark pool. LIQUIFI is completely blind to internal and external trading desks
 - Price Improvement – orders executed at, or better, than the NBBO.
 - A fully registered and SEC compliant ATS
- **LEVEL ATS – Boston Stock Exchange**
 - Partnership with Citi, Lehman Brothers, Merrill Lynch, CSFB, and Fidelity
 - Participating brokers can aggregate their internal liquidity on one platform
 - Pure order matching - no negotiation
- **BIDS – Block Interest Discovery Service**
 - Partnership with Citi, Goldman Sachs, Lehman Brothers, Merrill Lynch, Morgan Stanley, and UBS
 - An alternative to Liquidnet – BIDS offers both negotiation and automatch functionality
- **LAVA**
 - Technology driving all of the above initiatives and managing one billion shares of order flow each day; creating Lava’s “DarkBook” hidden liquidity pool
- **BEX, PHLX, NSX, BOX**
 - Investments in multiple exchanges and Alternative Trading Systems (ATS)
- **Flow, Citi ECN**
- **Access to ATD liquidity**
 - **Citi now has 12% market share in the US.**

EUROPE



- **Organisational requirements**
 - Compliance arrangements and internal systems and controls changes (i.e. conflicts of interest, outsourcing, etc)
- **Conduct of business**
 - Client classification changes and repapering tasks (i.e. TOB, best execution policy)
 - Client communication changes affecting financial promotions and marketing functions
 - Additional client suitability and appropriateness requirements
 - Best execution requirements
 - Client order handling requirements
- **Pre-trade transparency**
 - Quoting obligations for systematic internalisers
- **Post-trade transparency requirements**
 - Extended post-trade transparency requirements when executing outside regulated markets or multilateral trading facilities
- **Cross-border business, branching & passporting**
 - Extension of the range of activities and instruments covered by the passport
 - MiFID covers the European Economic Area (30 Countries)
- **Pan European Settlement**

- Best execution policies are not all the same.
 - Best execution is driven by clients not regulation
 - Execute only the national exchange?
 - Broker selection becomes crucial
- New trade reporting requirements
 - Must report within 3 minutes
 - Reporting target is realtime
- Are data vendors ready?
 - Need for a LAVA style amalgamated order book
 - Bloomberg
 - Enabled selection of venues for combined order book and quote recap
 - Combined orderbook does not merge venues
 - Reuters
 - Includes Boat Quotes
- Data capacity issues
 - Forced market making in liquid names.
- Settlement on multiple venues
- Need for European smart order routing technology
 - Does it already exist?
- Benchmarking across multiple venues

- Deadlines will almost certainly not be met by several member states
- Higher Compliance costs and greater operational complexity
- Consolidation in brokerage and Exchanges arena
- Increased demand for reliable multi source market Data, better Connectivity / DMA / Algorithmic Trading
- Trading Volumes will increase due to competition of execution venues
 - Reduced bid ask spread
 - Reduced execution costs
- OTC markets will be more heavily regulated
- Search for less Stringent Regimes (e.g. UCITS III)

► MiFID Initiatives**■ BOAT**

- Pan European trade reporting facility which will satisfy the Broker Dealers' regulatory requirements for pre-trade transparency and post-trade reporting
- ABN AMRO, CITI, CS, HSBC, MS, ML, GS, UBS, DB
- BOAT aims to attract other pan European participants as well as market data distributors
- **Market making on MiFID liquid list required for systematic internalisation**

■ Turquoise

- Pan European Multilateral Trading Facility (MTF) as envisaged by MiFID
- Turquoise will have enhanced functionality and will transact large and small orders on a pan-European basis
- CITI, CS, MS, ML, GS, UBS and DB
- Turquoise will feature an open architecture model, encouraging participation from any qualified market participants
- Visible and hidden order books
- Expected Q2 2008
- Settlement via standard domestic route

- Buy 10000 Fortis, current price 26.46

Single Stock Impact -- Web Page Dialog

Identifier: FORA NA Run

Shares: 10000 Reset

Side: Buy

Name: **FORTIS ORD**

Shares: 10,000

Value (USD): 361,594

Base Price (Local): 26.580

8/28/2007 close

Average Daily Volume (ADV): 5,903,382

% ADV: 0.17%

% Intraday Volatility: 18.97%

Avg. Bid/Ask Spread (full): 8.00bps

Est Exec Price if time-to-fill is:	Low Range 1.0σ	Expected Impact Cost	High Range 1.0σ
3 min (optimal time-to-fill)	26.423	26.489	26.556
13% Participation (Optimal)	26.423	26.489	26.556
One Day	26.274	26.466	26.659
210 min (1:00 PM - 4:30 PM)	26.330	26.467	26.604

Data Confidence: High 1.3 Low

Optional Settings

Start time: 1 PM 00 End time: 4 PM 30

Risk Tolerance: Get It Done

Time-to-fill: Optimal

Participation Rate: Optimal

Display Est Exec Price

Use Close

26.46

-OR-

Expected Impact cost

Basis Points

\$ per share

Expected Impact: Cumulative Distribution

Optimal Time To Fill: 3 Minutes (1 % of Day)

Cost-Risk Trade-off

26.489

<https://am.becsonline.com/ASFP/impactcost/SingleSI.aspx>
Internet ms.ms.

FORTIS Equity MDM Export Related Functions Favorites Terminal Help

GRAB EquityMDM
 At 13:56 Vol 2,131,302 Op 26.79 A Hi 26.85 A Lo 26.42 A ValTrd 56793984

FORA NA Equity Market Depth Monitor FORTIS

View BBO Horizontal Display BMQ

Ex	Total	Size	Ord	Bid	Ask	Ord	Size	Total	Ex
NA	3497	3497	2	26.46	26.46	1	44	44	BB
NA	9295	5798	3	26.45	26.48	3	2566	2610	NA
BB	11295	2000	1	26.45	26.49	3	7901	10511	NA
NA	13130	1835	1	26.44	26.50	2	7674	18185	NA
BB	24059	10929	3	26.44	26.50	5	12417	30602	BB
NA	30561	6502	3	26.43	26.51	4	8972	39574	NA
BB	34010	3449	2	26.43	26.51	5	6121	45695	BB
NA	35642	1632	2	26.42	26.52	3	8729	54424	NA
BB	41600	5958	2	26.42	26.52	2	3940	58364	BB
BB	50419	8819	5	26.41	26.53	3	5500	63864	BB

Time	Ticker	Size	Price	E
13:56:21	FORA	1000	26.47	A
13:56:13	FORB	63	26.5	B
13:56:13	FORB	937	26.5	B
13:56:13	FORA	717	26.48	A
13:56:12	FORB	1324	26.5	B
13:56:12	FORA	860	26.48	A
13:56:08	FORA	1638	26.48	A
13:56:08	FORA	200	26.48	A
13:55:54	FORB	595	26.48	B
13:55:49	FORB	266	26.51	B
13:55:49	FORB	100	26.49	B

Volume Distribution at 13:56:24

NA BB VX LI IM

Exchanges NA BB VX LI IM
 Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
 G410-481-0 30-Aug-07 13:57:01

- Citi's Smart Order Router will control the posting and removal of liquidity across multiple markets
- Citi benefits from the many years of development experience and intellectual property of LAVA Trading.
- LAVA Trading operates and maintains the premier smart order routing technology in the US
- Key requirements of a Smart Order Router
 - Speed
 - Intelligence
 - Reliability
- Communication with upstream systems for optimal execution and internalisation - LIQUIFI

- Each of these three strategies is available as a 'Wait and Pounce' style order, a Fill and Kill order or with posting. Posting can be 'vanilla' - the residual will be posted to the top-ranked venue, or 'Strategic Post'. SP will distribute volume across multiple venues and re-allocate dynamically based on fill rates.

Sweep	The most aggressive strategy. This will route orders to multiple venues simultaneously up to a limit price, with the quantities routed to each venue depending on price, visible volume and historical dark liquidity profiles.
Market	A series of sweep orders, but with an instantaneous limit price pegged to the best available price across European markets are sent out sequentially - i.e. a buy market order will not trade through the EBBO, unless a 'discretion offset' is specified. MARKETS ARE ABLE TO REACT TO THE FIRST SWEEP.
Probe	Probe is sends the entire order as a Fill-and-Kill order to each venue in turn, with priority determined by price and typical levels of dark liquidity. This is designed to capture hidden volume on each venue.

- Ability to target single venue – It is expected all orders will be routed using the primary identifier and chosen destination.

Discretion	The user will have the ability to post to a single venue at a limit price, but Sweep to a price determined by the discretion offset parameter (as a number of ticks).
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- ▶ **Single central limit orderbook**
 - **Visible**
 - **Fair**

AEX NETHERLANDS				Combined Order Book				Brussels Belgium		
Size	Bid	Ask	Size	Size	Bid	Ask	Size	Bid	Ask	Size
3000	26.46	26.47	3000	5000	26.46	26.47	5000	26.45	26.48	1000
6000	26.45	26.48	3000	2000	11500	26.45	26.48	26.45	26.48	1000
4000	26.44	26.49	2000	5000	5500	26.44	26.49	26.44	26.49	500
				1000	900	26.43	26.50	26.43	26.50	200

- Assumption - AEX is highest ranking order destination market, Turquoise second, Belgium third; for posting, theoretical ranking is AEX, Turquoise, Brussels, split 60%, 30%, 10%.

AEX NETHERLANDS			
Size	Bid	Ask	Size
3000	26.46	26.47	3000
6000	26.45	26.48	3000
4000	26.44	26.49	2000

TURQUOISE			
Size	Bid	Ask	Size
2000	26.46	26.47	2000
5000	26.45	26.48	5000
1000	26.44	26.49	1000

Brussels Belgium			
Size	Bid	Ask	Size
500	26.45	26.48	1000
500	26.44	26.49	500
900	26.43	26.50	200

- Buy 10000 FORA NA with a limit of 26.48
 - Sweep
 - Market
 - Probe
- Buy 10000 FORA NA with a limit of 26.46
 - Sweep Post
 - Market Post
 - Probe Post

Combined Order Book			
Size	Bid	Ask	Size
5000	26.46	26.47	5000
11500	26.45	26.48	9000
5500	26.44	26.49	3500
900	26.43	26.50	200

- Buy 10000 FORA NA with a limit of 26.48
 - Sweep

AEX NETHERLANDS			
Size	Bid	Ask	Size
3000	26.46	26.47	3000
6000	26.45	26.48	3000
4000	26.44	26.49	2000

TURQUOISE			
Size	Bid	Ask	Size
2000	26.46	26.47	2000
5000	26.45	26.48	5000
1000	26.44	26.49	1000

Brussels Belgium			
Size	Bid	Ask	Size
500	26.45	26.48	1000
500	26.44	26.49	500
900	26.43	26.50	200

Ticker

- 10:00.000 buy 2000 Fortis @ 26.47 TUR
- 10:00.000 buy 5000 Fortis @ 26.48 TUR
- 10:00.000 buy 3000 Fortis @ 26.47 AEX

Combined Order Book			
Size	Bid	Ask	Size
5000	26.46	26.47	5000
11500	26.45	26.48	9000
5500	26.44	26.49	3500
900	26.43	26.50	200

- Buy 10000 FORA NA with a limit of 26.48
 - Sweep

AEX NETHERLANDS			
Size	Bid	Ask	Size
3000	26.46	26.48	3000
6000	26.45	26.49	2000
4000	26.44		

TURQUOISE			
Size	Bid	Ask	Size
2000	26.46	26.49	1000
5000	26.45		
1000	26.44		

Brussels Belgium			
Size	Bid	Ask	Size
500	26.45	26.48	1000
500	26.44	26.49	500
900	26.43	26.50	200

Ticker

- 10:00.000 buy 3000 Fortis @ 26.47 AEX
- 10:00.000 buy 2000 Fortis @ 26.47 TUR
- 10:00.000 buy 5000 Fortis @ 26.48 TUR

Order Complete buy 10,000 Fortis @ 26.475

Combined Order Book			
Size	Bid	Ask	Size
5000	26.46	26.48	4000
11500	26.45	26.49	3500
5500	26.44	26.50	200
900	26.43		

- Buy 10000 FORA NA with a limit of 26.48
 - LAVA Market

AEX NETHERLANDS			
Size	Bid	Ask	Size
3000	26.46	26.47	3000
6000	26.45	26.48	3000
4000	26.44	26.49	2000

TURQUOISE			
Size	Bid	Ask	Size
2000	26.46	26.47	2000
5000	26.45	26.48	5000
1000	26.44	26.49	1000

Brussels Belgium			
Size	Bid	Ask	Size
500	26.45	26.48	1000
500	26.44	26.49	500
900	26.43	26.50	200

Ticker

- 10:00.000 buy 3000 Fortis @ 26.47 AEX
- 10:00.000 buy 2000 Fortis @ 26.47 TUR

Combined Order Book			
Size	Bid	Ask	Size
5000	26.46	26.47	5000
11500	26.45	26.48	9000
5500	26.44	26.49	3500
900	26.43	26.50	200

- Buy 10000 FORA NA with a limit of 26.48
 - LAVA Market

AEX NETHERLANDS			
Size	Bid	Ask	Size
3000	26.46	26.48	3000
6000	26.45	26.49	2000
4000	26.44		

TURQUOISE			
Size	Bid	Ask	Size
2000	26.46	26.48	3000
5000	26.45	26.49	1000
1000	26.44		

Brussels Belgium			
Size	Bid	Ask	Size
500	26.45	26.48	1000
500	26.44	26.49	500
900	26.43	26.50	200

Ticker

- 10:00.000 buy 3000 Fortis @ 26.47 AEX
- 10:00.000 buy 2000 Fortis @ 26.47 TUR
- 10:00.642 buy 2000 Fortis @ 26.47 TUR
- 10:00.642 buy 1000 Fortis @ 26.47 BEL
- 10:01.284 buy 2000 Fortis @ 26.48 TUR

Order complete buy 10,000 Fortis @ 26.472

Combined Order Book			
Size	Bid	Ask	Size
5000	26.46	26.48	7000
11500	26.45	26.49	3500
5500	26.44	26.50	200
900	26.43		

- Buy 10000 FORA NA with a limit of 26.48
 - Probe

AEX NETHERLANDS			
Size	Bid	Ask	Size
3000	26.46	26.48	1000
6000	26.45	26.49	2000
4000	26.44		

TURQUOISE			
Size	Bid	Ask	Size
2000	26.46	26.48	5000
5000	26.45	26.49	1000
1000	26.44		

Brussels Belgium			
Size	Bid	Ask	Size
500	26.45	26.48	1000
500	26.44	26.49	500
900	26.43	26.50	200

Ticker

- 10:00.000 buy 3000 Fortis @ 26.465 TUR (hidden)
- 10:00.000 buy 2000 Fortis @ 26.47 TUR
- 10:00.030 buy 3000 Fortis @ 26.47 AEX
- 10:00.030 buy 2000 Fortis @ 26.48 AEX

Order complete buy 10,000 Fortis @ 26.4705

Combined Order Book			
Size	Bid	Ask	Size
5000	26.46	26.48	7000
11500	26.45	26.49	3500
5500	26.44	26.50	200
900	26.43		

- Buy 10000 FORA NA with a limit of 26.46, display max 5000.
 - Sweep-Post

-2000 26.46

AEX NETHERLANDS
60%

Size	Bid	Ask	Size
4000	26.46	26.47	3000
6000	26.45	26.48	3000
4000	26.44	26.49	2000

3000 26.46

TURQUOISE
30%

Size	Bid	Ask	Size
3000	26.46	26.47	2000
5000	26.45	26.48	5000
1000	26.44	26.49	1000

1000 26.46

Brussels Belgium
10%

Size	Bid	Ask	Size
1000	26.46	26.48	1000
1000	26.45	26.49	500
500	26.44	26.50	200

Ticker

- Buy 1500 Fortis @ 26.46 TUR
- Buy 500 Fortis @ 26.46 BEL
- Buy 2000 Fortis @ 26.46 TUR

Combined Order Book

Size	Bid	Ask	Size
8000	26.46	26.47	5000
11500	26.45	26.48	9000
5500	26.44	26.49	3500
900	26.43	26.50	200

- Learning from the US experience is essential but a European solution is paramount
- A brokers responsibility to provide Best Execution
- Being MiFID compliant does not imply true Best Execution
- Broker selection and evaluation is the key

- For further information please contact

- eesales.eu@citi.com
- +44 20 7986 0711

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