Stock Trading Systems: China and US Comparison

Princeton, April 29 & 30, 2016

Liquidity Creation

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First Point I Wish to Make

1. **Volatility is Endemic in Equity Markets**
    - ➤ **across Stocks**
    - ➤ **across Markets**
    - ➤ **across Countries**
    - ➤ **across Time**

An Early Volatility Paper

"Liquidity and Execution Costs in Equity Markets"

Joel Hasbrouck & Robert Schwartz

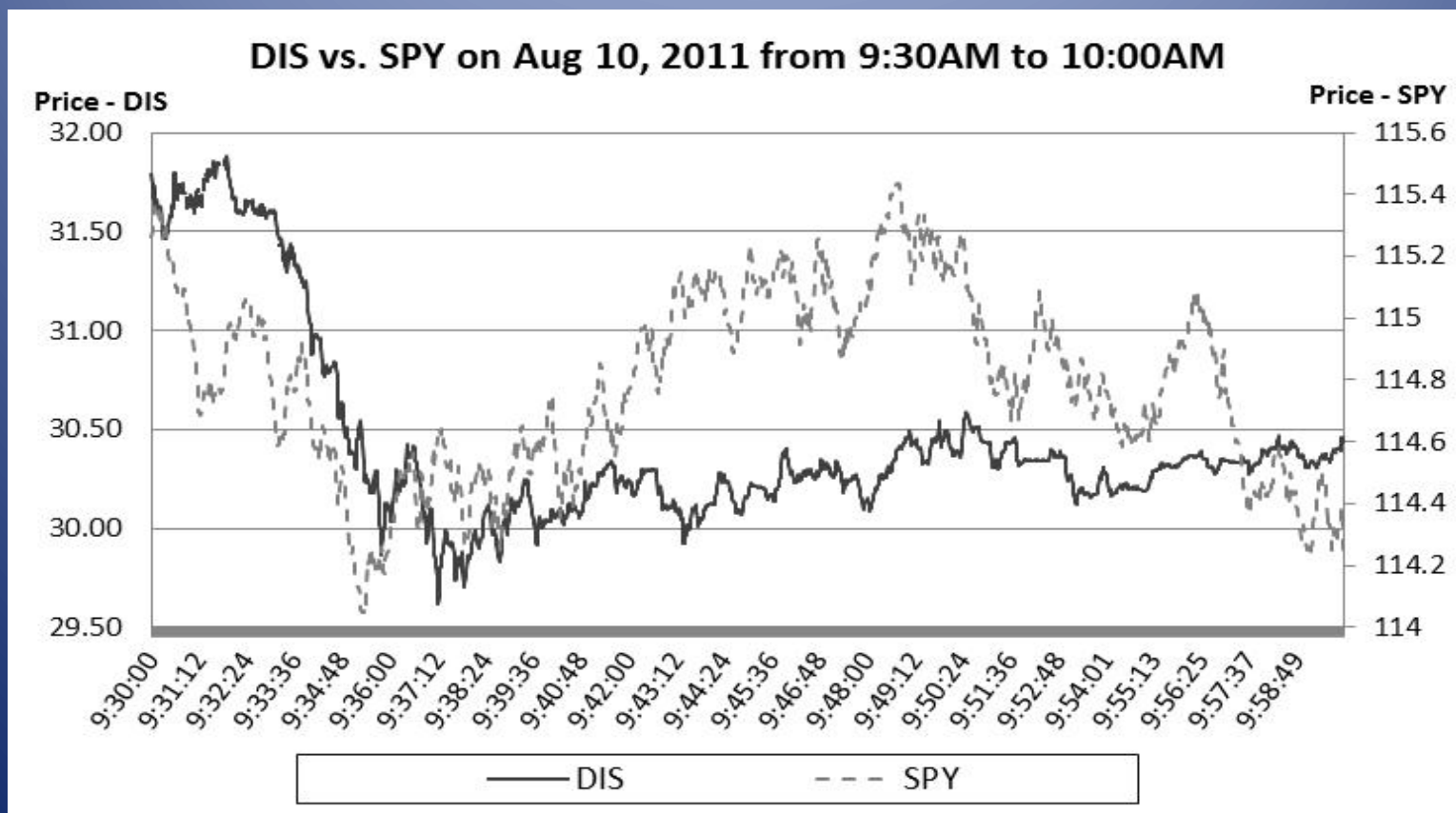*Journal of Portfolio Management*

Spring 1988, pp. 10 - 16

(There are any number of other papers as well)

Prices for Disney & SPY
Opening half-hour, August 10, 2011

Average Price = $30.34, Hi-lo = $2.31 Bid-Ask Spread = $0.02 Hi-Lo percent = 7.55

DIS vs. SPY on Aug 10, 2011 from 9:30AM to 10:00AM

Second Point I Wish to Make

1. Volatility is Endemic in Equity Markets
   - ➢ **across Stocks**
   - ➢ **across Markets**
   - ➢ **across Countries**
   - ➢ **across Time**

2. **Volatility is Linked to Liquidity, & Liquidity is Multi-Faceted**

Liquidity Providers

1. **Market Makers**
2. **HFT Participants**
3. **Limit Order Traders**
4. **Anyone Else?**

Liquidity
What is it?

Common Definition: Ability to buy/sell

- ✓ **Quickly**
- ✓ **In Reasonable Size**
- ✓ **At a Reasonable Price**

Liquidity
A More Operative Definition

Static Dimensions

❖ **Breadth:** number of orders on the book; typically measured by the bid/ask spread

❖ **Depth:** size of the orders on the book

Relates to **Reasonable Speed and Size**

Dynamic Dimension:

❖ **Resiliency:** more complicated

Relates to **Reasonable Price**

A Paper in Process

**"Are Stocks Priced to Yield
a Non-Resiliency Premium?"**
Jian Hua, Lin Peng, Robert Schwartz, Nazli Sila Alan

Resiliency in Common Usage

An ability to withstand something

- **A tree subjected to a wind storm**
- **A person subjected to a criticism**
- **A stock subjected to a shock**

Volatility: If a **Shock** Jars a Stock's Price from Equilibrium

Is the return to equilibrium
- **Orderly?**
- **Speedy?**

My Third Point

1. Volatility is Endemic in Equity Markets
   - across Stocks
   - across Markets
   - across Countries
   - across Time

2. Volatility is Linked to Liquidity, & Liquidity is Multi-Faceted

3. Non-Liquidity Premiums are Substantial
   (With emphasis on Non-Resiliency)

Why A Non-Resiliency Premium (NRP)?

- **A slow, disorderly adjustment commands a premium**

- A NRP can be understood in terms of:

- ❖ **Blurred price signals that lead to a decline in investor confidence**
- ❖ **Transaction price uncertainty**
- ❖ Unfairness (the system is rigged)

From Shocks to Return Correlations

Shocks:

- **Liquidity**
- **Information**

Prices:

- **Open: P^O (call auction)**
- **Mid: P^M (continuous/call)**
- **Close: P^C (call auction)**

Returns:

- **R1 = P^O to P^M**
- **R2 = P^M to P^C**

Correlation:

- ***CORR* (R1, R2)**

CORR & a Non-Resiliency Premium

As *CORR* decreases and becomes a larger negative number:

- **The price signal becomes more blurred**
- **Transaction price uncertainty increases**
- **The perception of unfairness grows**

- **We thus expect that the non-resiliency premium will be negatively related to *CORR***

What Do We Find?
(Hua, Pang, Schwartz, Alan)

Our Sample
- **All NYSE, Nasdaq, and Amex firms**
- **1993 – 2012**

We Assess
- **Daily opening, 10:00, and closing prices and quotes**

NRP-*CORR* Relationship Assessed

- **Tests**
  - ❖ **Uni-variate & bi-variate sorts**
  - ❖ **Multi-variate regressions**
- **Selection of months**
  - ❖ **All months**
  - ❖ **Earnings months**
  - ❖ **Recession/crisis months**
  - ❖ **High VIX months**
  - ❖ **Unusual months (December/January)**
- **Selection of firms**
  - ❖ **All firms**
  - ❖ **S&P 500 companies**
- **Various robustness checks**

Monthly Returns for Portfolios
All Firms & S&P 500 Firms

Deciles/ Quintiles	Monthly Ret Diffs Sorted by Liquidity		
	CORR	-Spread	-Amihud illiquidity
All Firms			
1 - 10 (Low-High)	**0.37**	**1.16**	**0.74**
	[3.26]	[4.31]	[2.68]
S&P 500 Firms			
1 - 5 (Low-High)	**0.31**	**0.33**	**0.40**
	[2.47]	[1.05]	[1.25]

Differential Monthly Returns

My Fourth Point

1. Volatility is Endemic in Equity Markets
   - across Stocks
   - across Markets
   - across Countries
   - across Time

2. Vol is Linked to Liquidity, & Liquidity is Multi-Faceted

3. Non-Liquidity Premium is Substantial

4. **Static & Dynamic Liquidity Provision Can be Integrated**

Use a Call Auction
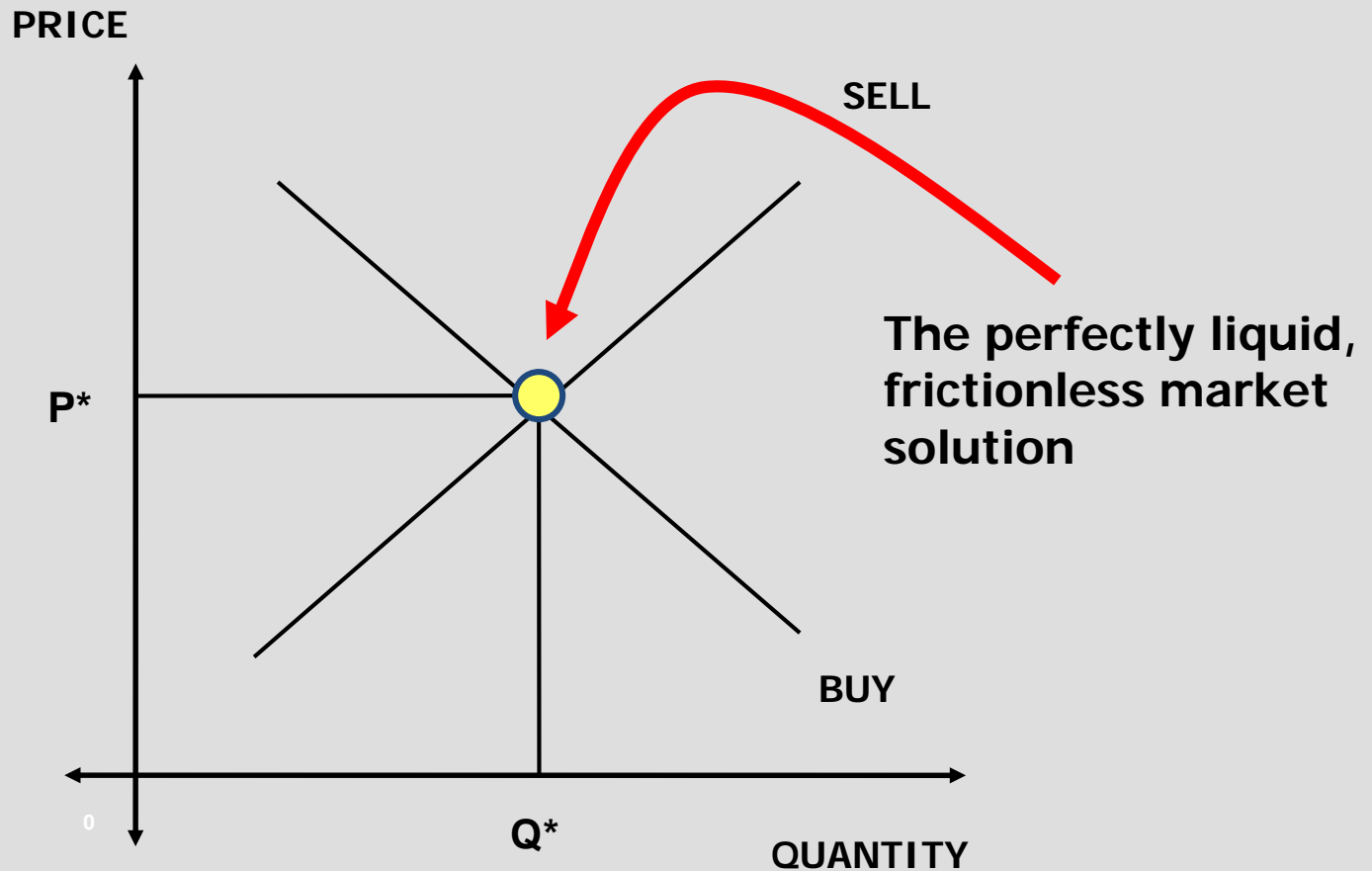
Three Papers

- "Electronic Call Market Trading," Nicholas Economides and Robert Schwartz, *Journal of Portfolio Management*, Spring 1995, pp. 10 – 18"

- "A Closing Call's Impact on Market Quality at Euronext Paris," Michael Pagano and Robert Schwartz, *Journal of Financial Economics*, 68, 2003, pp. 439-484.

- "A Call Auction's Impact on Price Formation and Order Routing: Evidence from the Nasdaq Stock Market," Michael S. Pagano, Lin Peng, & Robert Schwartz, *Journal of Financial Markets*, May, 2013

What About Circuit Breakers?

There is one big reason to stop trading in a continuous market

So that the market can be

reopened using a

Call auction

Awesome

Last Point

1. **Volatility is Endemic in Equity Markets**
    - ➢ across **Stocks**
    - ➢ across **Markets**
    - ➢ across **Countries**
    - ➢ across **Time**

2. **Vol is Linked to Liquidity, & Liquidity is Multi-Faceted**

3. **Non-Liquidity Premium is Substantial**

4. **Static & Dynamic Liquidity Provision Can be Integrated**

5. **Liquidity Provision Can be Augmented (A proposal)**

Two Papers

"A Proposal to Stabilize Stock Prices"
Robert A. Schwartz
Journal of Portfolio Management
Fall 1988, pp. 4 - 11

"A Liquidity Program to Stabilize Equity Markets"
Nazli Sila Alan, John S. Mask, & Robert A. Schwartz
Journal of Portfolio Management
Winter 2015, pp 113-125.

I Propose

1. Establish Stabilization/Liquidity (SL) Funds
2. Source of Funds **US: Listed companies**
3. Source of Funds **China:**

   Where there is a will, there will be a way
4. With Clearly Specified Operations including,
5. SL Orders Submitted for Call Auction Trading Only

Price Impact of an SL Order in a Call Auction
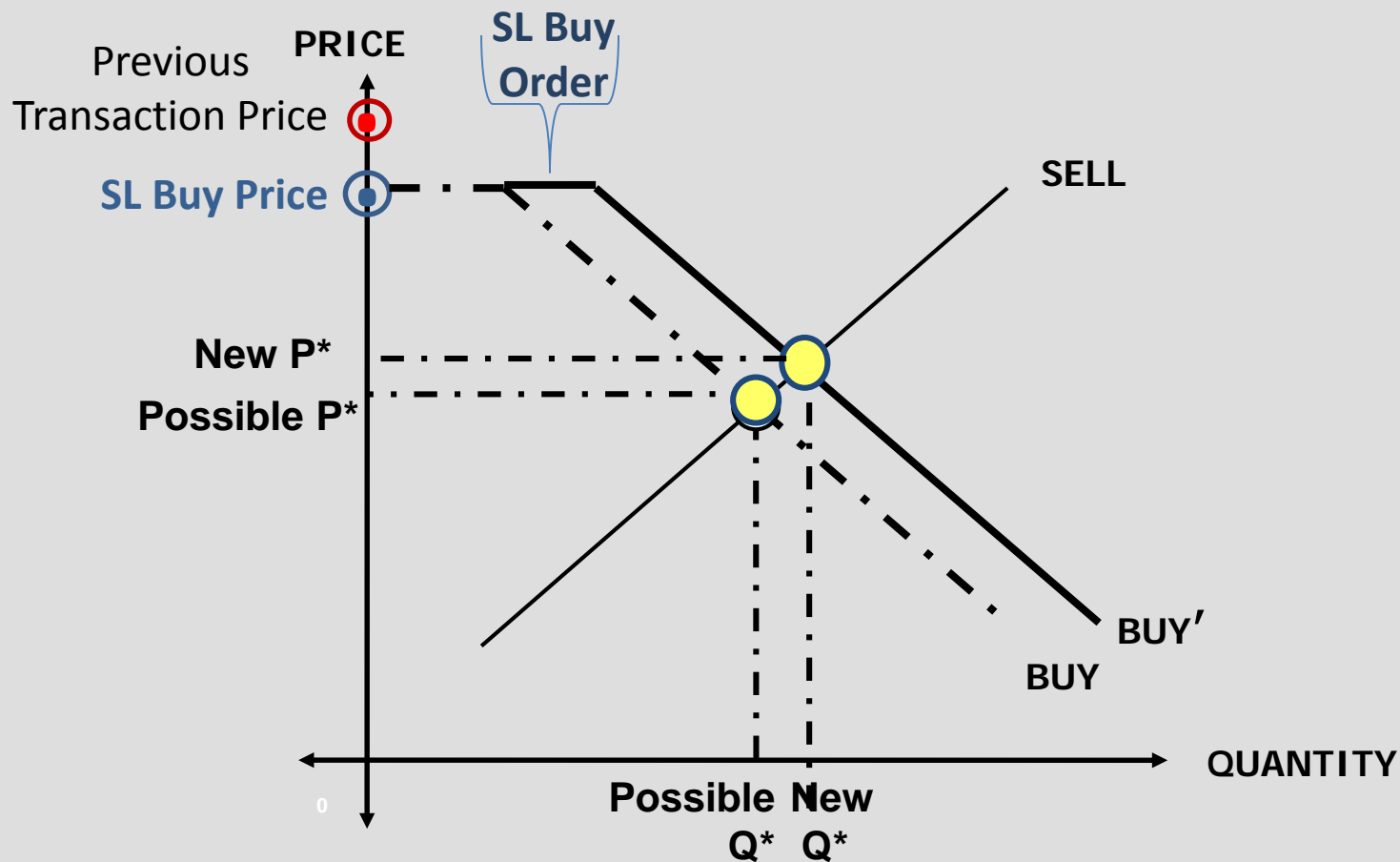
Trading Returns From SL Program
DOW 30

	Forward				Backward			
	2010	2011	2012	2010-2012	2010	2011	2012	2010-2012
P&L (mil$)	$13.57	$12.99	$16.41	**$42.98**	-$5.70	$1.89	-$6.35	**-$10.16**
P&L Marked-to-Mkt (mil$)	$0.81	$0.04	-$1.33	**-$0.48**	$1.09	$0.72	$0.68	**$2.49**

Trading Returns From SL Program:
DAX 30

	Forward				Backward			
	2010	*2011*	*2012*	*2010-2012*	*2010*	*2011*	*2012*	*2010-2012*
P&L (mil$)	$14.10	-$1.81	$12.38	**$24.67**	-$3.62	$15.57	-$8.41	**$3.54**
P&L Marked-to-Mkt (mil$)	$3.13	$15.65	$2.32	**$21.10**	$7.28	$5.58	-$0.43	**$12.43**

Conclusion

1. Accentuated Volatility is a Challenge

2. Liquidity Provision Matters

3. Market Structure Matters

4. My Suggestion:

   – Make Good Use of Call Auction Trading

   – Consider the Inclusion of SL Funding:

   This Would be True Liquidity Creation!

   Thank YOU!