

## TraderExercise #5



Bruce Weber, March 2010

### Trading with Dark Pool Liquidity

In this case you will gain experience in a hybrid market that combines a Limit Order Book with an integrated Block Trading Facility. The “Dark Pool” facility will enable you to complete large orders without displaying them in the order book or influencing the order book price. Your team will be given instructions to buy, sell, or day/proprietary trade and to complete the activity in the simulated market over the course of a trading day. At the end, you will analyze your performance as a team, and then with the other teams in your network, assess the outcomes resulting from your collective set of trading decisions.

#### Dark Pools

The origins of dark liquidity pools can be traced to the opening of the Posit “crossing network” in 1987. At specified times of the day (10 am, 11 am, ..), orders submitted to Posit would match at the midquote (average of bid and ask) without any pre-trade disclosure. Within several years, Posit accounted for about 3%-4% of U.S. equity trading volume. Dark pools of liquidity are order matching networks that hold large orders that are not displayed on order books. After a dark pool match, trades are reported and published in most major markets. Traders who wish to move large numbers of shares without revealing themselves to the open market find dark pools attractive because neither the size and price nor the trader’s identity is displayed.

More recently, Liquidnet and Pipeline have introduced dark pool systems. The figure below is the board of ticker symbols of European stocks. An orange symbol

indicates Pipeline has a order in the stock. When the orange is outlined in red or blue, that means the user has an order in the system to sell (red) or buy (blue). The bottom of the figure shows a 100,000 share Pipeline trade in AstraZeneca plc (AZN LN) at £25.51.

Pipeline Block Board								
AB	CE	FI	IM	MP	PS	ST	TZ	
AB1 GY	CGY GY	F IM	INB BB	MKS LN	PSPN SW	SON PL	TOM2 NA	
AFGB BB	CRL FP	FRO NO	IPM ID	ML FP	PTC PL	SOON SW	TYKS SS	
AH NA	DAI GY	GSK LN	JDW LN	NEX FP	PUM GY	STERV FH	VWS DC	
ALN1V FH	DSV DC	HMB SS	JJB LN	OR FP	ROG VX	STL NO	ZC FP	
AZN LN	ELUXB SS	HMV LN	KUD VX	OTE1V FH	RR/ LN	TA NA	ZURN VX	
BOS3 GY	EZJ LN	IHG LN	MBTN SW	PC IM	SAP GY			
Symbol	Last Trade	Pipe Total		Last		AZN LN	FRO NO	JJB LN
AZN LN	100,000 @ 2551.00	2,000,000		Trades:		CRL FP	CGY GY	OR FP

### Structure of Simulation Session

You will trade in a network with the other participants. While trading, some will be your competitors. In the post trade analysis, we will discuss and gain insights from your collective experience.

Before the start of a simulation run, you will be given a large order to buy, or a large order to sell, or will be placed in the position of a proprietary trader. You will have to decide how best to time, size, and price the orders you submit. The market structure you will be playing in comprises a limit order book facility and a continuous block trading facility. Our facility is based on the Pipeline model. You are free to choose between the block trading facility and the continuous order book venue.

Dark pools are for institutional size orders, which in the simulation is 250 units. Note that Block board orders are separate from the order book. Block board trades are determined from the order book, and when two standard market orders match in Pipeline

the default price is the midpoint of the Bid/Ask. Trades in Pipeline are not allowed to “trade through” order book quotes, which means the bid and ask price for the order book form the lower and upper bounds for dark pool trades.

In the illustration below, two order trades and two block board trades have occurred. The user has placed a passive, “limit” order to buy at 19.90 for 500 into the block board on the right. The order book quotes are 19.80 bid and 20.10 offer for a midpoint of 19.95. If a sell order is put into the dark pool that is willing to sell at 19.90 or lower, there will be a trade. To be ‘Active’ at this point, a buy order in the block board must be willing to pay 19.95 or more. An active order to buy and an active order to sell will match at the midpoint price (shown on the upper right of the block board).



Dark pools allow participants to put price limits on their orders. In the illustration below, a buyer on the left has a yellow light with a green outline (user has a buy order in the dark pool) on the STK1, and can click ‘Execute’ to buy at the price, which will be

above the midpoint. The seller on the right sees an orange light with a red outline (sell), indicating only that other orders are in the system.

The image displays two 'BLOCK BOARD' interfaces and a partial order book. The left interface shows a 'Market Buy' order for 250 shares at 20.00. The right interface shows a 'Limit Sell' order for 250 shares at 20.05. The order book below shows a bid-ask spread with a green highlight on the 19.90 bid and a red 'X' on the 20.00 bid.

TIME	\$	#	B/S	STATUS
9:49:06	Mkt	250	Buy	Active
9:42:42	20.05	250	Sell	Passive

  

	20.30	235		X
	20.20	175		X
	20.10	38		X
X	20.00			X
X	20 (0)	20	19.90	
X		208	19.80	
X		66	19.70	

To summarize the block board colors and features:

- Orange: There is a block board order for that stock
- Orange with Red outline: You have placed a sell order
- Orange with Green: You have placed a buy order
- Yellow with Green: You have placed an active buy order and there is a passive sell order
- Yellow with Red: You have placed an active sell order and there is a passive buy order

### Performance Measures

The teams that are given buy orders will be compared to each other, and the teams completing the buy order at the lowest price will win. Similarly, sellers achieving the highest average selling price win. Proprietary traders that return their positions to zero will be assessed based on their profit & loss (P&L) figure.

### To Do

1. Explain your trading strategy at the beginning of the session. What percentage of your trading instruction do you expect you will complete in the dark pool?
2. At any point did you change your trading strategy regarding the block board? If so, note the change and the time.
3. Record your closing position. Did you get your closing position to match the instruction given before the end of the run? If you did not complete your instruction before the end of the run, explain why.
4. Record your closing P&L, your average transaction price to buy and/or sell, and the VWAP for the run. Explain why you did or did not beat VWAP.
5. Explain any effect that the dark pool, vis-à-vis the limit order book, may have had on the pricing, sizing, and timing of your order placement decisions.
6. Describe two important things about dark pool trading and market structure that you learned from the simulation exercise.