

COMP226: Slides 08

Dark Pools

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Overview

- Background: **Front running**
- **Dark pools**: motivation, the mechanism, and examples

Front running

- Suppose a trader wants to buy a **large amount** of a stock (or other security)
- If **the market finds out this intention** the price of the stock will be driven up
- This happens via **front-running**: knowing that a large buy order is coming to the market, others buy first (either with limit or market orders) with the intention to sell when the price has risen
- This example could equally apply to a large sell order

Limit orders can be front run

Large limit orders can be "front-run" by **penny jumping**

Example

- TraderA places limit order to buy 100k shares at £1.00
- HFT trader places order at £1.01 and gets executed
- If the price now goes up, the HFT can sell for a profit
- If that starts to look unlikely, **HFT can exploit their speed and sell to TraderA for only £0.01 loss**

Motivation for dark pools

- Again, suppose a trader wants to buy a **large amount** of a stock (or other security)
- Executing in one go as **a market order will be costly**
- We have also just seen how **placing a single large limit order can be problematic too**
- Consequently, large orders are split into smaller ones (**iceberging**), either market or limit orders; we will discuss execution algorithms that do this in the next set of slides
- First, we consider a different type of execution mechanism, **dark pools**, that arose specifically to address the problem faced by traders wanting to trade large amounts

Light pools of liquidity

- A **limit order book** is typically **visible** to market participants
- Due to this transparency, limit order book markets are called **light pools of liquidity** (**visible** = **light**)
- We now look at **dark pools of liquidity**

Dark pools

- Used to **reduce market impact** when trading large orders
- the intentions of a trader are hidden from other market participants **until a trade happens**
- every individual trade happens at a **single price per unit** (and this is how market impact is limited)

Dark pools: the basic mechanism

- The **intention to buy or sell at current market price is indicated to the platform**
- If a match (i.e. trader "on the other side") is found the platform instigates a **trade at the current market price** (normally the **mid-price** of the relevant security in a light pool of liquidity)

Dark pools: example trade

Suppose trader A places an order in the dark pool to buy x units:

- **Example 1:** there was already a seller(s) waiting in the dark pool that wanted to sell $y > x$ units. In this case, trader A buys x units. Trader A learns that there was a seller(s) willing to sell **at least** x units (but does not learn exactly how much was available). After this match there will still be $y - x$ units available for sale in the dark pool.
- **Example 2:** there was already a seller(s) waiting in the dark pool that wanted to sell $z < x$ units. In this case, trader A buys z units. Trader A learns that there was a seller(s) willing to sell z units **but no more** (i.e. trader A learns the **exact liquidity that was available**). After this match the buyer will remain in the dark pool with $x - z$ units that he is still willing to buy.

Polling dark pools

When algorithmic traders decide whether to use light or dark pools of liquidity they often need to "poll" a dark pool to ascertain how much liquidity is available (i.e. **place trades to see whether or not they are executed**).

Ownership of dark pools

Dark pools are owned by different types of institution:

- Alternative Trading Systems/Multilateral trading facilities
- Broker-dealers
- Exchanges

Prevalence of algorithmic trading

- There are lots of dark pools of liquidity
- Liquidity in these pools is **not directly visible**
- They are **typically only accessible electronically**
- **Algorithmic traders** utilize them heavily