



Master of the Books

Bennett Stein

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The order books featured will be that of Bitmex, Binance and Coinbase Pro. Bitmex currently has the highest volume of any futures cryptocurrency exchange and so will be featured more often than the other exchanges. However, remember that for the most part that the strategies and rules featured within this guide can be used on any major cryptocurrency exchange.



Disclaimer: The content covered in this guide is NOT explicit investment advice and I am not a registered CFA or any other type of financial advisor. The material covered within this guide is for educational purposes only. Always do your own research and only invest based on your own findings and personal judgment. Happy Trading.

Glossary

Edge: An advantage that allows a trader to exploit an inefficiency in the market.

HFT: High frequency trading. An algorithmic trading bot that uses high-speed processing for generating/executing orders and short timeframes for establishing/exiting positions.

Spoofing: Bidding or offering with the intent to cancel the bid or offer before execution. This practice misleads traders about the actual supply/demand of the market.

Bid: A limit buy order that will only execute at a specific price level below price.

Offer: A limit sell order that will only execute at a specific price level above price. Also commonly called an ‘ask’.

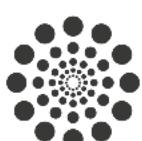
Order Wall: A large limit order. Large limit sell walls tend to prevent price from moving higher and large limit buy walls tend to prevent price from moving lower.

Limit Order Book: A collection of unexecuted limit buy and sell orders.

Stop Order: An order to market buy or market sell a coin once the price reaches a specified price.

Order Book Strategy: Using the limit order book to gauge price points of strong/weak supply/demand. This analysis can be used for direct placement of limit and stop orders or to gauge price’s future direction.

Order Depth Strategy: Analyzing the collection of limit orders to reveal the present supply/demand on a coin. This analysis is primarily used to gauge price’s future direction.



Order Flow Strategy: Analyzing the market order flow of orders on a coin. Order flow analysis provides the ‘aggression’ of the buyers/sellers. This analysis is primarily used to gauge price’s future direction.

ATAS: Advanced time and sales. A platform that shows order flow metrics as well as the DOM.

DOM: Depth of Market. Shows advanced information on the limit order book.

Market State: The present structure of the market. This can be either an uptrend, downtrend, or consolidation. Each market state is made up of a collection of demand runs, supply runs and phases of equilibrium.

Best Bid: The highest bid price in the limit order book. When you market sell, you sell at the best bid.

Best Offer: The lowest offer price in the limit order book. When you market buy, you buy at the best offer.

Demand Imbalance: When there is a larger depth volume of bids near price than offer depth volume.

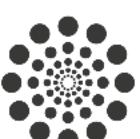
Supply Imbalance: When there is a larger depth volume of offers near price than bid depth volume.

Influx of Demand: When many bids are added to the order book, which can create a demand imbalance.

Outflux of Demand: When many bids are pulled from the order book, which can create a supply imbalance.

Influx of Supply: When many offers are added to the order book, which can create a supply imbalance.

Outflux of Supply: When many offers are pulled from the order book, which can create a demand imbalance.



Exclusive Video Access:

1. Supply/Demand Runs: <https://www.youtube.com/watch?v=MaIUTJ-FcJI>
 2. Locate Support/Resistance from the Heatmap:
<https://www.youtube.com/watch?v=oG6EOYCSmZk>
 3. Read the Market's Aggression: <https://www.youtube.com/watch?v=0MRn78jIFFE>
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Chapter 1. The Information Edge

1.1 Just Buy Low and Sell High

We live in an era of limitless information. You can pull out your phone and amass massive amounts of data within seconds. However, when it comes to major financial markets, a large majority of traders prefer to utilize only information offered to them from popular charting platforms. When beginning to speculate in these markets, uninformed traders may watch a few videos, read a few articles on basic trading strategies, and then apply what they've learned to attempt to profit off of the markets. They think that if they have seen evidence that a strategy has worked in the past, it will work in the future.

The harsh reality of the market is that the retail trader is set up to fail from the start. The market is zero-sum as one trader's gain is another trader's loss. If I buy at a market bottom, I need another trader to sell on my limit buy order at that market bottom. If I sell at a market top, I need someone to buy on my limit sell order at that market top. A trader's chance at success in any trade can be measured by the 'edge' that they have in the market that they are trading. The beginning trader who simply absorbs information they found online or heard about from a friend, and then applies to the market of their choice, hoping for the best, is trading without any inherent edge. In the long-run, this trader will find it near impossible to consistently profit and will likely lose all capital that they had placed on their exchange.

To achieve consistent profitability, you must create an edge. There are three edges that you can possess: a **speed advantage**, a **market share advantage**, and an



information advantage. A speed advantage allows you to buy just slightly before others buy, or sell just slightly before others sell. A market share advantage allows you to dominate a market due to the amount of volume that you are trading. This advantage can be realized when a trader owns a large portion of the coin's active market cap, and thus carries an almost virtual monopoly on that coin's trading, allowing them to manipulate that coin in any direction that they choose. Finally, an information advantage allows you to have advance knowledge of a higher probability that the market will move either up, down, or sideways within a given time period.

Possessing a speed advantage over other traders and over other trading funds is a fiercely competitive endeavor. Trading firms will attempt to have their HFT's place orders before other firms are able to at any cost. The winning trader has access to the best coding and is closest to the trading exchange itself, giving them a lower latency (the speed at which an HFT can respond to market events) than all other competing traders in the industry. Unfortunately, this type of edge is likely not an edge that you, the reader, will ever have access to in your lifetime. Even if you are in the minority that does have this level of access, you will be forced to compete every minute of every hour with other trading firms that are attempting to outpace the moves that your HFT makes.

Possessing a market share advantage is not legal in regulated markets; however, cryptocurrency trading is currently unregulated. For an example, if a trader own 50% of the total supply of an altcoin, they could spoof the market lower by placing many limit sell orders in order to manipulate price lower and market sell on the current bids to lower the price. After lowering the price, they can buy at low levels, pull the large limit sell orders and stop market selling. If need be, they can place buy limit orders to manipulate the price higher and market buy. As this cycle continues, a trader with a market share edge can continue to profit off of this short-term speculation.

Possessing an information advantage relies on brains instead of brawn. Think of betting on a horse race. Now, instead of trying to guess which is the fastest horse in the race, you use advance knowledge of which horse is most likely to win based on past statistics, patterns, and data-sourced information. Using information that most do not have access to, or information that most would not know how to fully interpret. In a market sense, you are able to recognize the reasoning behind why price really moves, and then position yourself ahead of that move with proper risk management.



Possessing a wide array of statistical information on the market's order book is what I believe will give you the best chance of staying ahead of the masses in this rapidly changing market that we call crypto. This guide will help you build your information edge in the manner that you choose. Select a few of the strategies mentioned here within, backtest them, practice them, trade them and then repeat the process until you have achieved a level of success that you are comfortable with.

1.2 The Casino and Their Least Favorite Customer

Before we launch into the order book and all of the data that we can harness to our advantage, let's take a quick detour to learn about someone who beat the market with an information edge: Edward Thorpe and the casino. In the 1950's and 1960's, Edward Thorpe was a blackjack player at various casinos, yet he was not your average run of the mill gambler.

Thorpe invented the practice of 'card counting' at the blackjack table. The basic philosophy of card counting is that if you take a deck of standard playing cards and deal out a blackjack hand, you have just been given information about the probability of future outcomes. Thorpe found that he could use this available information from the card deck, to estimate the future probability of the next card.

As the deck played out and Thorpe had access to more information, he bet small overall on each hand, with the expectation that his edge would generate him a profit in the long-run. He bet more when the deck was in his favor and lowered his bets when the deck did not favor him. After many other blackjack players began to adopt his card counting system, many casinos responded by making it as hard as possible for the players to hold the same consistent edge when playing. Thorpe adapted to the casino's increased vigilance on card counting by exploiting other casino efficiencies such as the mathematics behind the roulette wheel.

Thorpe later started a hedge fund, Princeton Newport Partners, and consistently beat the market using various strategies from statistical arbitrage to exploiting pricing inefficiencies with mathematical models. He was able to build various edges within both blackjack and in the market by amassing as much data as he could, thus gaining multiple information advantages.



While this guide is not about blackjack, card counting, or even statistical arbitrage, note that the nature of cryptocurrency trading exchanges is not too different from casinos. Due to the zero-sum nature of trading, there is a benefit from the informed market participants whenever an influx of uninformed traders trade on cryptocurrency exchanges and end up buying tops and selling bottoms, just like in poker where professional players can profit over time off of uninformed players who make poor decisions on either inaccurate information, out of an emotional response or a lack of calculation.

As Thorpe was able to exploit less sophisticated casinos in the past, you too must look to exploit the inefficiencies within the relatively new cryptocurrency market that we are trading today. The purpose of this guide is to aid you in discovering your own edge with a multitude of tools used by market professionals as well as novel ways of looking at the cryptocurrency market's many data sources.

1.3 Create Your Edge

In most established markets, there is typically a large pool of speculators who lose money and a small minority of speculators who make money. If you make the same decisions as the majority of the market does, then you will receive the same results that most traders receive, with the likelihood that you will lose more money than you had originally started with. However, if you have access to data on the future decisions that the majority of the market will make, then you can be able to buy before the masses buy and sell before the masses sell.

There are three types of strategies that will be featured in this guide: **order book, order depth, and order flow data**. You can use all three in your analysis, or you can choose to master only a few sections of one of these three strategies. In picking your trading strategy, use the method that makes the most intuitive sense to you.

I can't promise that strict adherence to the patterns mentioned within this book are going to make you money. No guide can promise you guaranteed profits. Rather, know that if you are able to absorb the information from these analyses and look deeper behind the significance of the patterns highlighted within this guide, then you can gain a greater understanding of what really moves the markets. Couple this knowledge with consistent practice and market experience that is gained over time and you may just have a shot of ending up on the winning side.



Chapter 2. The Limit Order Book

2.1 Interpreting the LOB

The Limit Order Book (commonly called “LOB” or “The Book”) is a list of visible orders by price that showcase the interest of the buyers as well as the interest of the sellers. Traders have the ability to place buy/sell limit orders. These are orders that will only execute if another market participant uses a market order to fill that said limit order. The term that describes the combined volume of limit orders located at a collection of price levels is called the market depth. The order book can be daunting to look at for the first time. There are orders that are constantly changing and many traders fail to fully comprehend it. Let’s break down the limit order book and the recent trades column.

Orderbook (XBTUSD)			Recent Trades (XBTUSD)
Price	Size	Total	
3854.5	329,838	3,230,771	
3854.0	109,209	2,900,933	
3853.5	86,850	2,791,724	
2 3853.0	4 216,106	6 2,704,874	
3852.5	58,193	2,488,768	
3852.0	327,935	2,430,575	
3851.5	295,276	2,102,640	
3851.0	14,709	1,807,364	
3850.5	1,792,655	1,792,655	
3850.0 ▼			
⌚ 3853.30 / 3853.29 ⏵ ⏵ ⏵ ⏵ ⏵			
3850.0	1,208,363	1,208,363	
3849.5	1,009,652	2,218,015	
3849.0	227,966	2,445,981	
1 3848.5	5 274,801	7 2,720,782	
3848.0	156,474	2,877,256	
3847.5	249,667	3,126,923	
3847.0	243,684	3,370,607	
3846.5	52,257	3,422,864	
3846.0	162,151	3,585,015	

Point 1: *Bid prices.* These are the prices at which the limit orders to buy are set.



Point 2: *Offer prices.* These are the prices at which the limit orders to sell are set.

Point 3: *History of market orders.* The far left column of this section shows the prices at which each transaction was made. A red market order means that a trader market sold at the price of the top bid (\downarrow 3850) during that point in time. A green market order means that a trader market bought at the price of the bottom offer (\uparrow 3850.5) during that point in time. The middle column (at which it reads 300, 15, 50 from the top) is the volume size of the order and the far right column shows the time at which the transaction took place.

Point 4: *The offer depth volume.* This shows the volume in contracts at the specific price at which a coin is being limit sold.

Point 5: *The bid depth volume.* This shows the volume in contracts at the specific price at which a coin is being limit bought.

Point 6: *Cumulative offer volume.* This shows the total volume in contracts of all lower offers combined. Example: the price of 3851.5 has a cumulative offer volume of 2,102,640 because the total offer volume from 3850.5, 3851, and 3851.5 is $(1,792,655 + 14,709 + 295,276 = 2,102,640)$. It would take a market buy of at least 2,102,640 contracts for price to breach 3851.5.

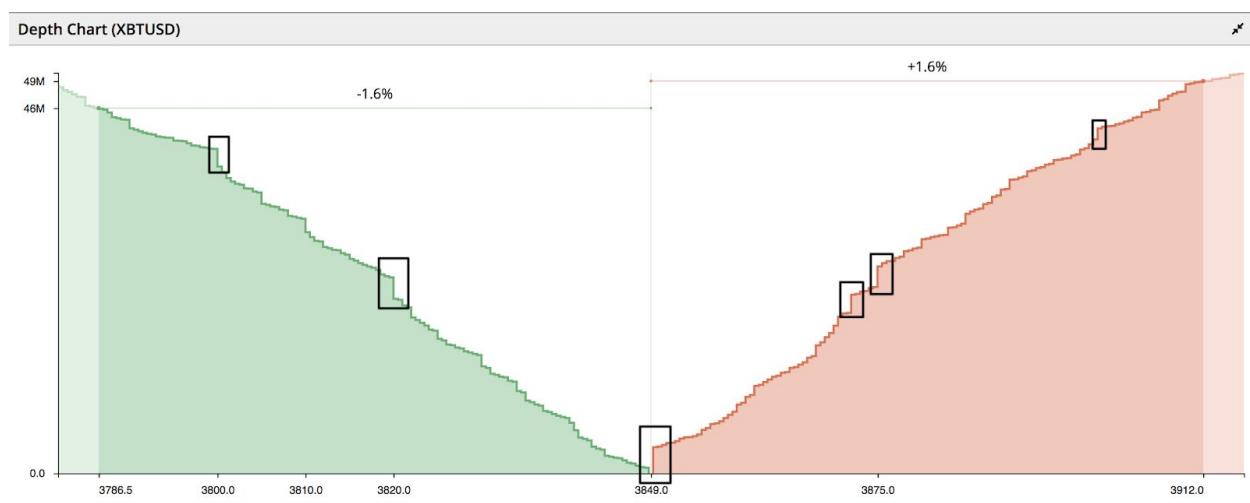
Point 7: *Cumulative bid volume.* This shows the total volume in contracts of all higher bids combined.

The red 3850 in between the bid and offer volume shows the last traded price. This is the price that is reported on all charting platforms such as Tradingview.



Price(USDT)	Amount(BTC)	Total(USDT)			
3870.04	0.186445	721.54960780	3,869.54	0.067080	16:51:19
3869.90	0.011510	44.54254900	3,869.54	0.245847	16:51:19
3869.87	5.670000	21,942.16290000	3,869.54	0.638996	16:51:19
3869.85	0.012500	48.37312500	3,869.15	0.039523	16:51:18
3869.83	1.815059	7,023.96976997	3,869.54	0.002960	16:51:18
3869.81	0.402072	1,555.94224632	3,869.54	1.176787	16:51:16
3869.54	7.668330	29,672.90966820	3,869.50	0.179589	16:51:16
3869.54 \$3,869.54			3,869.49	0.063290	16:51:16
			3,869.50	0.056611	16:51:16
			3,869.49	0.150081	16:51:16
			3,869.49	0.002826	16:51:15
			3,868.02	0.034831	16:51:12
			3,869.05	0.076996	16:51:12
3868.02	0.051685	199.91861370	3,869.55	0.003021	16:51:12
3868.01	0.058218	225.18780618	3,868.84	0.139253	16:51:06
3867.96	0.060000	232.07760000	3,868.31	0.063290	16:51:04
3867.95	10.774253	41,674.27189135	3,869.69	0.003053	16:51:04
3867.90	0.429635	1,661.78521650	3,869.06	0.004531	16:51:03
3867.89	0.030000	116.03670000	3,868.30	0.415293	16:51:01
3867.72	0.009680	37.43952960	3,869.78	0.012040	16:51:00
			3,869.30	0.037162	16:50:59

This is the Binance order book for BTCUSDT. The order book layout of Binance is similar to Bitmex, albeit instead of cumulative depth volume, Binance shows the order depth volume in both BTC and in USDT (or if the coin is FETBTC for example, than the shown amount would be FET and total would be BTC).



This is the basic Bitmex XBTUSD depth chart. The green area on the left shows cumulative bid volume and the orange area on the right shows cumulative offer volume.



The order depth volume is represented on the y-axis and the prices of that volume are represented on the x-axis. By hovering your cursor over the order depth, you can locate the order depth balance (more on this later). The indicated boxed points are where order walls are located (3800, 3820, 3849, 3870, 3875, and 3900).

After taking this picture of the depth chart, price moved lower as a supply run began.

2.2 Understanding the LOB

There are five ways in which we can use the LOB:

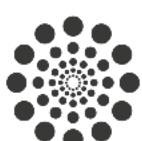
1. To place a limit order
2. To find the best time to use a market order
3. To locate an order depth imbalance
4. To locate areas of support and resistance
5. To gauge the supply and demand of the market

Let's say you want to buy a cryptocurrency. You have two options: either market buy or place a limit buy. If you market buy, you will buy at the current offer (the lowest limit sell order within the order book). If you limit buy, then you place a bid at whatever price that you so choose.

Let's say that you want to sell a cryptocurrency. You have two options: either market sell or place a limit sell. If you market sell, you will sell at the best bid (the highest limit buy order within the order book). If you limit sell, then you can place an offer (also known as an 'ask') at whatever price that you choose.

You can use the order book for support/resistance levels (how to do so will be covered in a later chapter). However, only looking at a fast-moving order book (such as XBTUSD on Bitmex) for locating order depth imbalances can be difficult as that limit order book might be constantly changing. To resolve this problem, looking at **historical order depth** (using order depth tracking tools not offered by an exchange) and **order flow** may work better for predicting price's future movements.

2.3 Be A Good Negotiator



Whenever you are opening or closing a trade, you must decide whether to place a limit or a market order. Think through this reasoning as if you were negotiating with someone sitting across from you - would you rather be the party that accepts the term for that negotiation (buying/selling using a market order) or would you rather be the party that sets the terms (placing a limit buy/sell order)?

The answer is not as obvious as it may seem (the answer is NOT to always use limit orders). Just like in business negotiation strategy, there are times in which it is advantageous to conform to the other party's terms and other times in which it is advantageous to be the one setting the terms. A negotiator that is overly aggressive and uncompromising may find potential business partners turning away; as with trading, you may find that solely using limit orders can lead to your orders never getting filled. Worse yet, a negotiator that is overly passive and always accepts the other party's terms = will likely make bad deals; as with trading, you may find that solely using market orders can lead to transacting at less than optimal prices as well as higher fees.

Every trader's strategy for execution will vary, however, many traders might choose to only enter using a limit order and then exit in profit with a limit order as well as only enter using a limit order and exit at a loss with a market order. This will mean that your winning trades will carry less fees (or even a rebate), but your losing trades will carry slightly higher fees. This method allows losing trades to be quickly cut and winning trades to run longer.

Later in the guide, we will look at different strategies for executing orders such as position-based trading and order-based trading. With these execution strategies, there are advantages in certain market scenarios to being patient and other market scenarios where it may be better to be impatient.

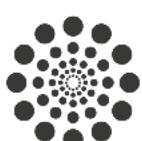
Data Links

★ Bitmex Order book

<https://www.bitmex.com/app/trade/XBTUSD>

★ Binance Order Book + Depth Chart

https://www.binance.com/en/trade/pro/BTC_USDT



Chapter 3. Supply and Demand Runs

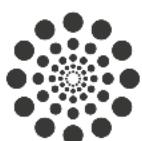
3.1 In Any Trend

Look at any timeframe on any trend of a cryptocurrency and you will notice that there is never a situation in which the market moves only up, only down, or only sideways. In any uptrend, there will be times in which price moves back down. And in any downtrend, there will be times in which price moves back up.

Notice the market structure that forms on the smallest timeframe of 1m (available on most charting platforms). There are four ways in which we can categorize this micro market structure:

1. Demand Run: A demand run is a micro structure pattern in which price continuously moves upward. You will see price rising with many bids near the top of the order book, not too many large offers, and a surge in market buying. During a demand run, it will be easy to fill your limit sell order.

Below is an example of price action. The trend from point 1 to point 2 shows a strong demand run. Notice how price was able to consistently move higher with little pullback.



Below is an order book example of a demand run. Notice the volume of the bids and offers near price. The volume on the top bid is much larger than the volume on the bottom offer. Additionally, notice the surge in market buying in the recent trades column.

Orderbook (ETHUSD)			⚙️	⤓	✖️	Recent Trades (ETHUSD)			⤓	✖️
Price	Size	Total				Price	Size	Time	Side	
131.75	275,540	2,473,453				131.35	3,601	3:11:37	B	
131.70	158,116	2,197,913				131.35	4,399	3:11:37	B	
131.65	717,827	2,039,797				131.35	110	3:11:36	B	
131.60	462,630	1,321,970				131.35	6,000	3:11:34	B	
131.55	88,665	859,340				131.35	110	3:11:34	B	
131.50	220,137	770,675				131.35	6,742	3:11:32	B	
131.45	180,592	550,538				131.35	1,000	3:11:32	B	
131.40	352,563	369,946				131.35	1,702	3:11:32	B	
131.35	17,383	17,383				131.35	4,000	3:11:32	B	
131.35 ⬆️						131.35	1,556	3:11:32	B	
🌐 131.31 / 131.31 ⏵⠄⠄⠄⠀						131.35	3,000	3:11:23	B	
131.30	689,380	689,380				131.35	2,370	3:11:22	B	
131.25	1,143,630	1,833,010				131.35	512	3:11:22	B	
131.20	620,641	2,453,651				131.35	7,118	3:11:22	B	
131.15	669,873	3,123,524				131.35	4,984	3:11:20	B	
131.10	1,045,528	4,169,052				131.35	9	3:11:20	B	
131.05	363,975	4,533,027				131.35	7	3:11:20	B	
131.00	227,083	4,760,110				131.35	727	3:11:19	B	
130.95	94,598	4,854,708				131.35	1,500	3:11:19	B	
130.90	95,865	4,950,573				131.35	11,857	3:11:19	B	
						131.35	4,000	3:11:19	B	
						131.35	16,916	3:11:19	B	
						131.35	1,000	3:11:18	B	
						131.35	4,700	3:11:17	B	

- Supply Run: A supply run is a micro structure pattern in which price continuously moves downward. You will see price falling with many offers near the bottom of the order book, not too many large bid orders, and a surge in market selling. During a supply run, it will be easy to fill your limit buy order.

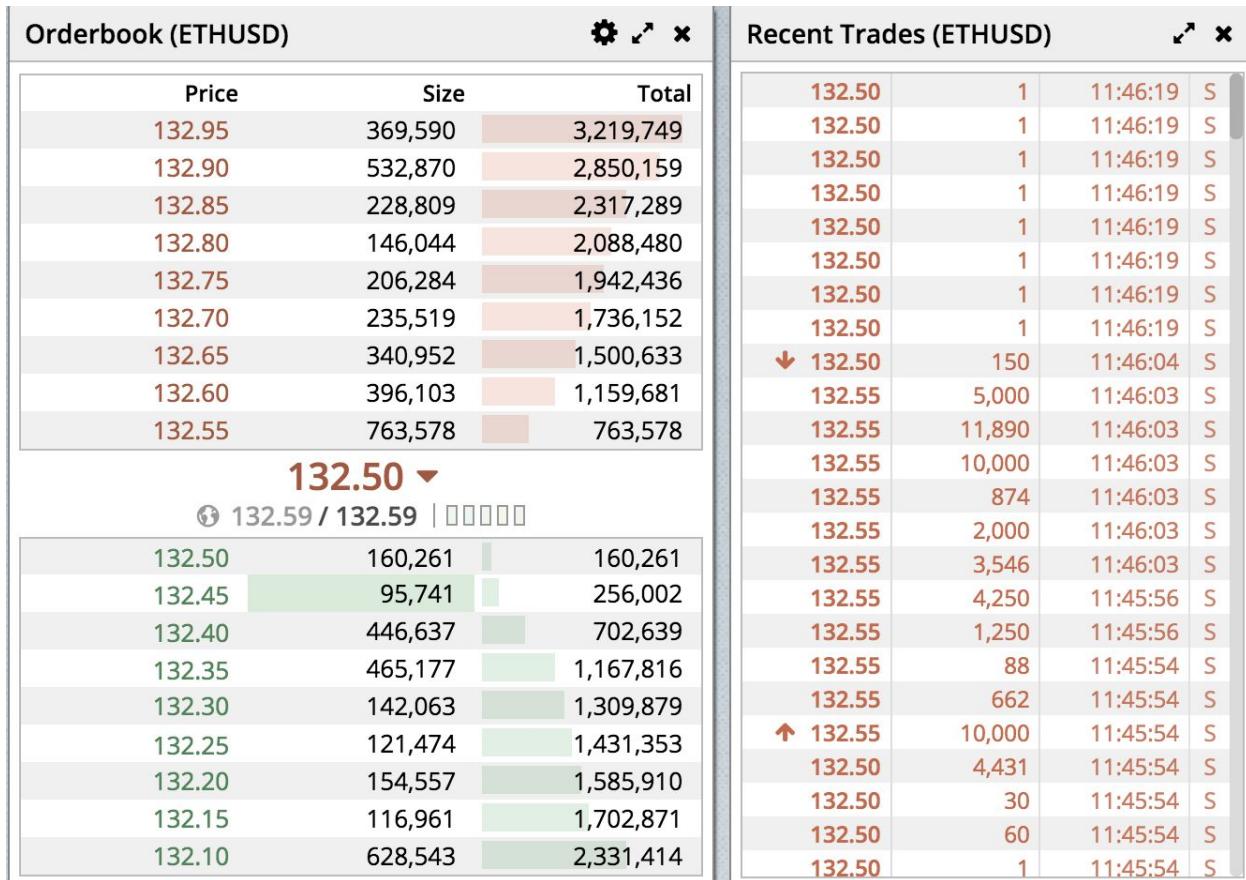


Below is a price action example; the trend from point 1 to point 2 shows a strong supply run. Notice how price was able to consistently move lower with little pullback.



Below is an order book example of a supply run. Notice the volume of the bids and offers near price. The volume on the bottom offer is much larger than the volume on the top bid. Additionally, notice the surge in market selling within the recent trades column.





3. Active Equilibrium: Active equilibrium is a pattern in which price continuously bounces from the top bid and the bottom offer. The cryptocurrency will look as if it is simply bouncing between two prices. It is called an active order ‘equilibrium’ because the forces of supply and demand are relatively equal and the top bid and bottom offer are ‘active’ as they contain an above-average amount of order depth volume.



Below is a price action example; the consolidation from point 1 to point 2 shows an active equilibrium. Notice how price during this period wasn't able to move beyond the top bid or the bottom offer — hence why it bounced between the two prices of 3911.5 and 3912.



Below is an order book example of active equilibrium. Notice that the top bid and bottom offer contain roughly the same amount of volume. Additionally, the majority of the local order volume is concentrated at the highest bid and at the lowest offer. Once price breaks through the bottom offer at 3845, price will likely have a much easier time rising.



Consequently, if price breaks through the top bid at 3844.5, price will likely have a much easier time falling.

Orderbook (XBTUSD)			⚙️	⤔	✖	Recent Trades (XBTUSD)			⤔	✖
Price	Size	Total				Price	Size	Time		
3849.0	143,148	3,964,020				3844.5	508	1:18:56	S	
3848.5	315,458	3,820,872				3844.5	190	1:18:56	S	
3848.0	138,127	3,505,414				3844.5	123	1:18:56	S	
3847.5	142,597	3,367,287				⬇️ 3844.5	408	1:18:54	S	
3847.0	476,156	3,224,690				3845.0	50,000	1:18:50	B	
3846.5	157,364	2,748,534				⬆️ 3845.0	10	1:18:46	B	
3846.0	419,234	2,591,170				3844.5	12	1:18:42	S	
3845.5	487,796	2,171,936				3844.5	2,000	1:18:40	S	
3845.0	1,684,140	1,684,140				⬇️ 3844.5	14	1:18:24	S	
3844.5 ⏪						3845.0	315	1:18:14	B	
⌚ 3845.01 / 3844.77 🔍🔍🔍						⬆️ 3845.0	1,000	1:18:13	B	
3844.5	1,579,126	1,579,126				3844.5	25,000	1:18:12	S	
3844.0	539,493	2,118,619				⬇️ 3844.5	140	1:18:07	S	
3843.5	635,657	2,754,276				3845.0	13	1:18:02	B	
3843.0	234,542	2,988,818				⬆️ 3845.0	32	1:18:00	B	
3842.5	776,866	3,765,684				3844.5	303	1:18:00	S	
3842.0	239,260	4,004,944				3844.5	91	1:18:00	S	
3841.5	226,845	4,231,789				3844.5	20	1:18:00	S	
3841.0	222,318	4,454,107				3844.5	86	1:18:00	S	
3840.5	845,221	5,299,328				⬇️ 3844.5	1,000	1:17:59	S	
						3845.0	155	1:17:48	B	
						⬆️ 3845.0	100	1:17:48	B	
						3844.5	36	1:17:34	S	
						3844.5	131	1:17:24	S	

4. Inactive Equilibrium: Inactive equilibrium is a pattern in which price moves sideways and there are no large bid or offer walls near the current traded price. It is called an inactive order equilibrium as there is pressure from supply and demand, but there are no major active order walls at the top bid or bottom offer. It will be easy to fill your limit buy or sell order during this period.

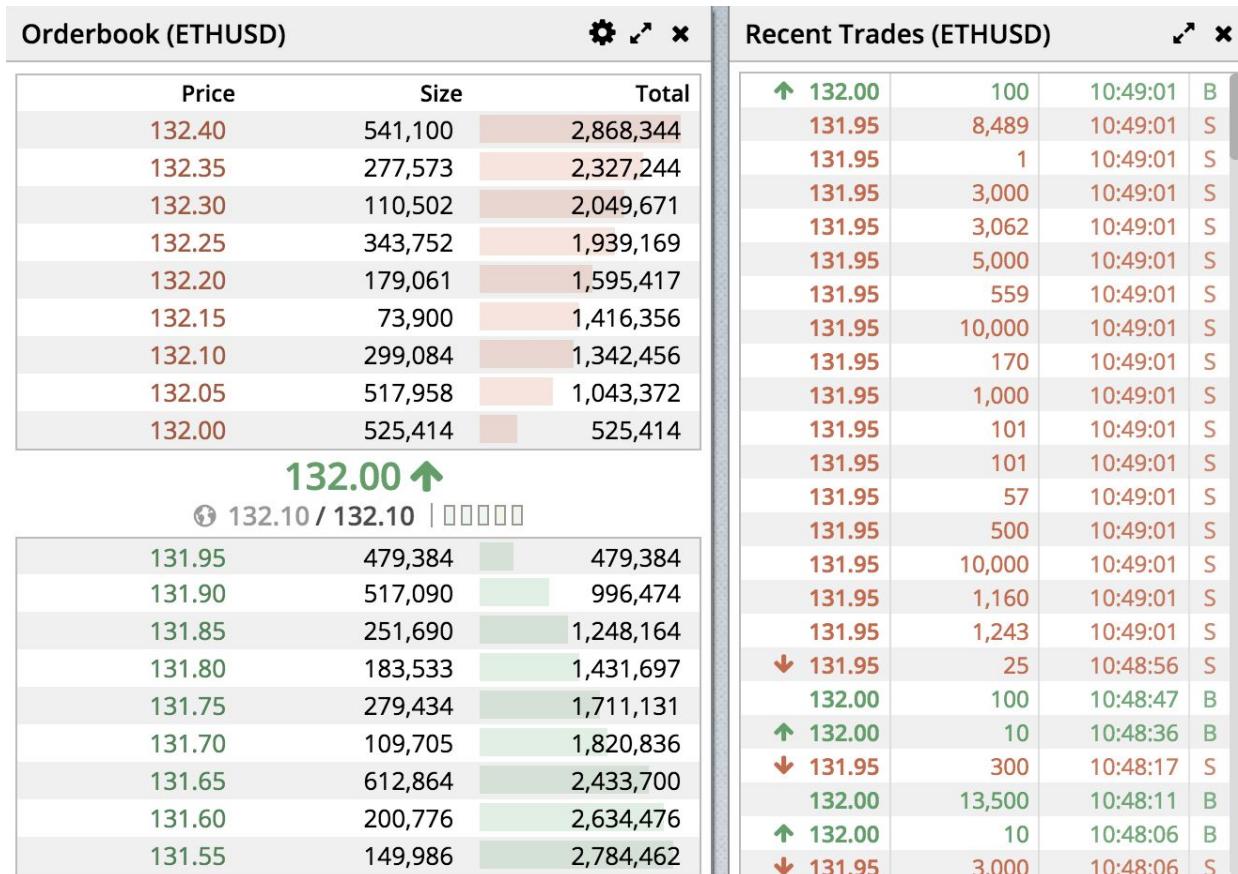


Below is a price action example of inactive equilibrium. There are no large bid walls or offer walls, so price consolidated in a tight range from 3700 to 3704.5.



Below is an order book example of inactive volume. Notice that the top bid and bottom offer contain roughly the same amount of volume. The cumulative local order book is roughly equal as well, as the offers from 132 to 132.4 total to \$2,868,344 of volume and the bids from 131.95 to 131.55 total to \$2,784,462 of volume. Additionally, notice that the majority of order depth volume is not concentrated at the highest bid and lowest offer. This lack of order depth volume near the present price will make it easier for price to move both up and down.





There is no way of knowing how long an order book pattern will last or how strong a supply/demand run will be. That means that if a demand run begins, we don't know with exact certainty if price will rise by .1% or by 1% within a few minutes or within a few hours. If we have an inactive order book equilibrium pattern, we don't know how long the pattern itself will last either (however, strong market buying/selling tends to break price out of these equilibrium patterns). However, we do know when these order book patterns have ended as we can see when a supply run has turned into either equilibrium or into a demand run. Due to this, we typically want to **use demand runs to get our offers filled** and **use supply runs to get our bids filled**. It is important to note that supply and demand runs are used as both a strategic analysis and to provide the necessary liquidity to fill our limit orders. With a strong analysis of market liquidity, you can avoid making the mistake of market buying during a demand run or market selling during a supply run unless absolutely necessary (such as closing a position in a loss).



Professional market makers use this type of method. They take advantage of the prolonged period of market buying/selling to fill their limit orders as they know that no demand or supply run lasts forever. Think like a market maker, and not like the retail trader who ends up buying market tops and selling market bottoms.

3.2 Placing Limit Orders

During a demand run: If you are bearish, place an offer to go short/exit long

During a supply run: If you are bullish, place a bid to go long/exit short

During an active equilibrium: Try not to place a limit order at the best bid/offer

During an inactive equilibrium: If you are bearish, then place an offer as the market fluctuates higher and if you are bullish then place a bid as the market fluctuates lower

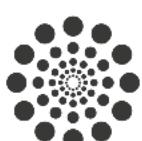
The reason why it is not advised to use a limit order during a period of active equilibrium is that if your limit order gets filled when price is bouncing between a single bid and a single offer, price is likely to just continue moving in that direction against you.

Here are two scenarios that illustrate why it may not be best to place limit orders during a period of active equilibrium:

Scenario 1: Price on the ETHUSD order book is bouncing between the bid of 140.1 and the offer of 140.15. You are bearish, so you place your limit sell at the bottom offer at 140.15. You were correct in your analysis, and price moves lower below 140.1 but your order does not get filled.

Scenario 2: Price on the ETHUSD order book is bouncing between the bid of 140.1 and the offer of 140.15. You are bearish, so you place your limit sell at 140.15. You were incorrect in your analysis. Your order gets filled at 140.15 and price continues higher, leaving you in an unprofitable position.

Neither of these scenarios are desirable. When price is in a gridlock, it may be wise to place your bids and offers farther away from the best bid and best offer or to wait for one side to break through the equilibrium and then reevaluate your execution strategy.





The price action above from 11:03 to the present time on the graph shows a period of inactive equilibrium, where price has transitioned from a demand run to a state of equilibrium. It is exactly during this time that you must decide whether to use a bid or offer, but only if you have done your analysis and arrived at a bullish/bearish conclusion.



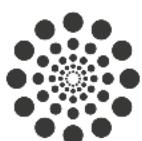
Price continued the uptrend. The period of inactive equilibrium would have made for a great time to get a limit buy order filled.



Here is another play that you can make using your knowledge of supply/demand runs.



In the short-term, price is in an uptrend. We do not know if this will continue or if a downtrend will begin which is why we must always use a proper analysis of the order book/order depth/order flow so that we can gauge with a strong probability where price will likely move in the future. If you were bullish and were interested in opening a long position, then setting a limit buy order (or multiple limit buy orders) just below 6257 would be the play to make.



The horizontal line above is set at 6257, at the close price of the recent candle on the example above. Price went slightly below and any limit buy orders that were placed just below that level would have been filled before price rose higher.

Think of trading as three parts: the **mental game** (sticking to your system, controlling your emotions), the **analysis** (deciding when to enter/exit a long/short position), and the **execution** (setting the price of a limit order or timing a market order).

Consistently executing limit orders at optimal prices is a skill that can be developed over time through both practice and experience. For practice, take a look at the content from the final portion of this guide or create your own practice problems. Experience is gained from taking multiple trades and looking back and learning from those trades. Combine these two and over time you can begin to master the placement of limit orders.

3.3 Placing Market Orders

During a demand run: If you believe that the market has topped out and your limit sell will not get filled, you can use a market sell order. Caution: you may want to only do this when exiting a long.

During a supply run: If you believe that the market has bottomed out and your limit buy will not get filled, you can use a market buy order. Caution: you may want to only do this when exiting a short.

During active equilibrium: If your analysis is bullish and there is a large order wall present at the top bid and at the bottom offer, market buying might allow you to trade at a good price. If your analysis is bearish and there is a large order wall present at the top bid and at the bottom offer, market selling might allow you to sell at a good price.

During inactive equilibrium: There isn't much reason to use a market order when the order book is in inactive equilibrium. Price will be moving up or down within the equilibrium range, allowing you to use a limit order instead.

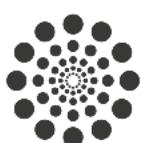


Using market orders for entry can be avoided by waiting for price to begin a supply/demand run to fill your limit order. If you are bullish and price begins to rise without you, market buying immediately might be a mistake as you are market buying into an already existent demand run. Instead, if you are interested in entering long, the patient approach of using a bid and waiting for a supply run or a period of inactive equilibrium may be best.

Using market orders for exits is a different story. Patiently waiting for a limit order to fill so that you can exit your position can lead to more losses than if you had just used a market order to exit. If you are short and price rose, putting you at a loss, setting a bid and then waiting for it to allow you to exit your position could be costly if price does not move back lower to reach your bid. **If price is in a demand run but you are short and you believe that price will continue to rise, then market buying to exit your short might be the best option.** Exiting and then re-evaluating is a far better outcome than holding a losing position and getting liquidated or holding onto that coin forever at a loss.

Now imagine the same scenario as above, but this time price fell and you are in profit. As the supply run continues, your analysis turns bullish and you believe that it may be a good time to exit. **Using a market buy order to exit might not be necessary as the supply run would likely fill your bid anyway.** Placing a bid a bit below the current price and then waiting for the supply run to push price lower so that you can exit your short is likely the best play to make.

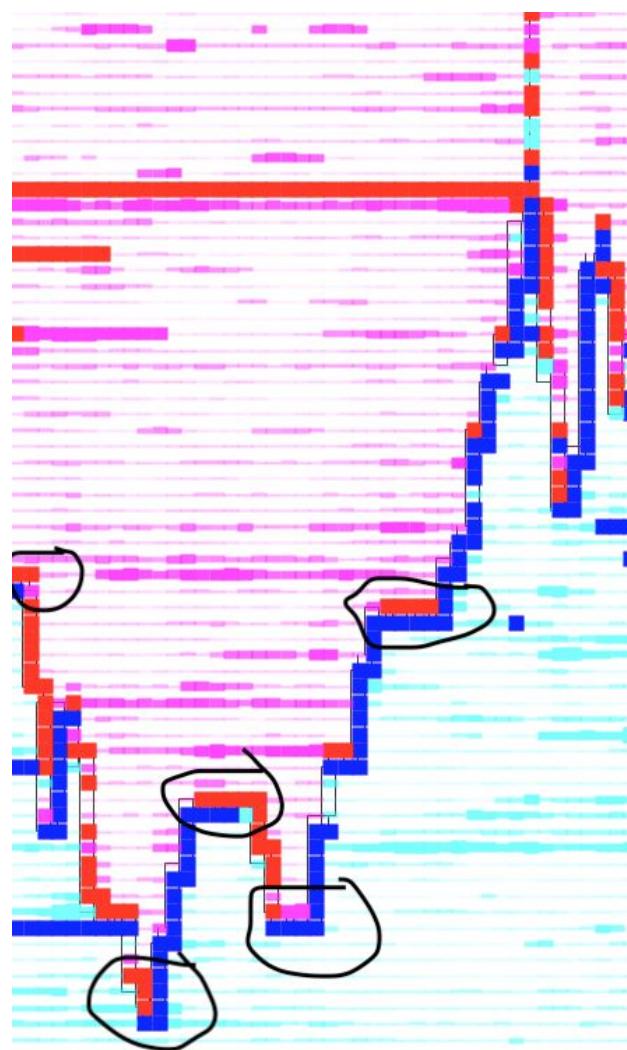
When to use a market order versus when to use a limit order is not a question that can be fully answered in this brief section. However, before deciding which type of order to use, first diagnose the market structure. Look for supply runs, demand runs, and equilibriums. Knowing this, you can then decide which type of order will be best for taking advantage of that specific market structure. For example, there typically is not much reason to market sell during a demand run or market buy during a supply run as your limit orders placed against the trend will likely fill anyway. Likewise, there is not much reason to place limit orders in active equilibrium. With the knowledge of different types of market structures, you will likely feel much more comfortable in choosing how to execute orders that supplement your market analysis.



At the end of this guide, there are practice examples to help with order placement and your market awareness of supply/demand runs. Additionally, there are practice exercises in the final chapter that you can use to further supplement your learning.

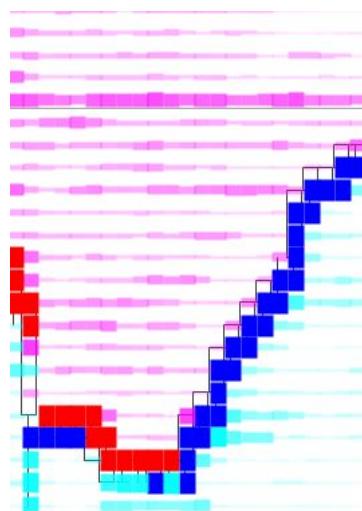
3.4 Advanced Order Flow and Supply/Demand Runs

Taking a look at the advanced charting platform, ATAS, we can visualize supply and demand runs easily. Transparent candles are used in the chart below, when those candles turn blue, this signifies that there is a large bid that is actively pushing price higher. When those candles turn red, this signifies that there is a large offer that is actively pushing price lower. The picture below is a 30-second timeframe look at supply and demand runs.



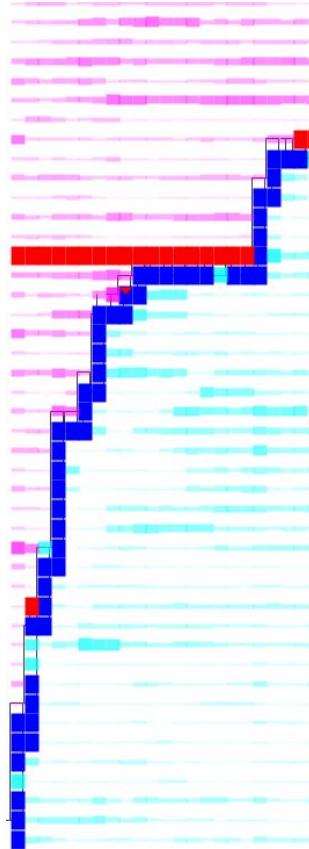
Price on the y-axis and volume was not included in the picture above in an attempt to maintain focus on the red and blue levels that show supply/demand shifting over time. Notice that on the far left (the first black circle on the chart), the red offers push price lower. At the direct bottom of that market, take a look at the second black circle. The large offers were pulled or filled, and then strong bidding pressure pushed price higher (blue). Now take a look at the third black circle, price was bid up to that level and then a large offer pushed price lower until a large bid was placed at the fourth circle. That bidding pressure was able to propel price higher. The large offer that was placed at the fifth circle was filled and price continued to be bid higher in a strong demand run.

When short-term trading, you can discern how strong a demand run is by checking the extent to which bids are pushing price higher. Look at the outcome of the demand run to check whether the bids were able to push price up, .1% or 1%, for example. You can discern how strong a supply run is by checking the extent to which offers are pushing the price lower in a similar manner.

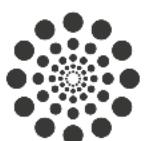


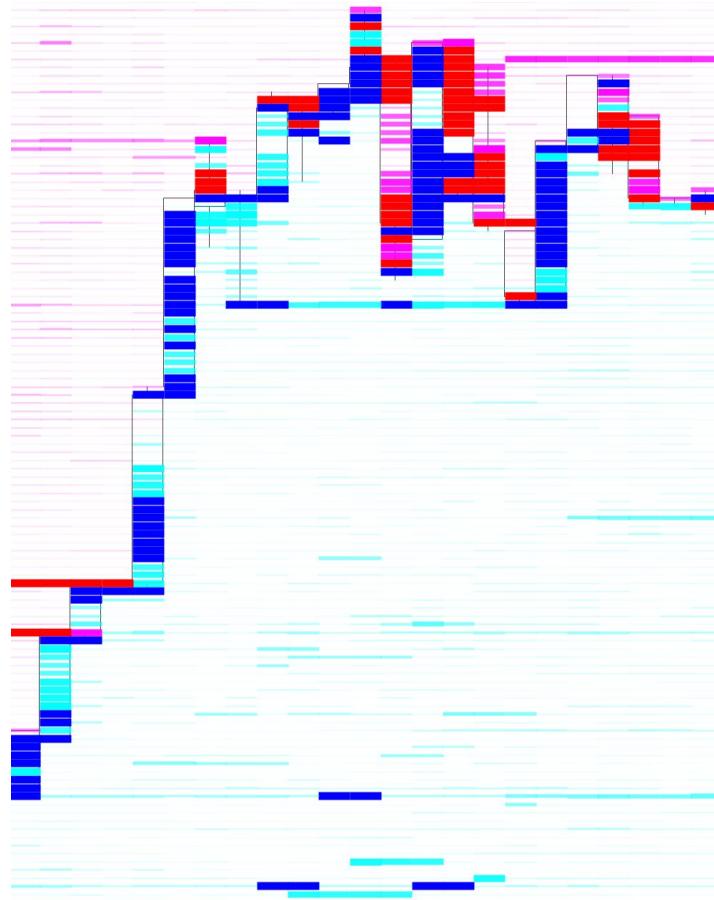
Take a look at the zoomed-in demand run shown above. As price moved higher, you can see that a large bid was constantly placed as the best bid. Now take a look at the picture below, which shows where price went after the strong demand run above.





The period of strong bidding continued and price moved higher. Notice the large limit sell wall that price approached (large red block in picture above). The heavy period of bidding did not stop and the demand run continued higher. Thus, the demand run was strong enough to move past a large limit sell order.





In the picture above, we can see a strong demand run carried price higher until price began to consolidate. Getting a limit sell order filled during this demand run would have been quite easy as the market buyers were quite aggressive. Getting a limit buy order filled during this demand would have been quite difficult. After this picture was taken, price fell.

Using this type of visual for supply/demand runs is an order flow approach (which will be further expanded on in the last few chapters). The advantage to this setup is that you can discern exactly when price is in a supply run (red), demand run (blue), active equilibrium (red and blue one tick away, with price moving flat), or inactive equilibrium (red and blue not near price, no large limit order presence).

Data Links

★ Tradingview Chart

<https://www.tradingview.com/chart/>



★ ETHUSD Order Book

<https://www.bitmex.com/app/trade/ETHUSD>

★ Advanced Order Flow (ATAS)

<https://orderflowtrading.net/atas-crypto/>

Chapter 4. Order Depth

4.1 An Analogy to Supply and Demand

Imagine that you are buying apples at a farmers market. The shoppers and the vendors are bartering on the sale price of the apples. Currently, the lowest price offered by an apple vendor for one apple is \$0.50 and the highest price that an apple shopper bids at is a price of \$0.49. Furthermore, imagine that, within this apple market, you notice that there are 10 shoppers who are each willing to buy an apple at the price of \$0.49. However, there are only two sellers who are willing to sell at a price of \$0.50. That means that the order depth for the sellers at the lowest sell price of \$0.50 is currently \$1 (2 vendors x their sale price of \$0.50). The total order depth for the buyers at the highest buy price of \$0.49 is currently \$4.90 (10 shoppers x their buy price of \$0.49).

The forces of demand are dominant over the forces of supply in this market; as there are more shoppers who are willing to buy than vendors willing to sell and the excess demand between the shopper's highest price and the vendor's lowest price is \$3.90 (\$4.90 - \$1). So what tends to happen in a situation like this? Price tends to rise on excess demand. This imbalance that favors the shoppers is likely to result in many shoppers buying the vendor's apples at the indicated price of \$0.50.

Price is likely to rise on excess demand because the pool of shoppers aren't left with many options if they are interested in being able to buy the apples that they want to take home. Here are three options that a shopper has:

1. They can bid at the price of \$0.49 and hope that a vendor sells to them at that price.
2. They can bid at a lower price, such as \$0.48, and hope that a vendor sells to them at that price.



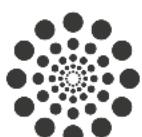
3. They can accept the vendor's lowest offered price of an apple at \$0.50.

If they choose to bid at the price of \$0.49, it's unlikely that their order for an apple at that price will be filled. There isn't much reason for the vendors to accept the shoppers' price at \$0.49 because there are many more shoppers who are interested in buying at \$0.49 than vendors who would like to sell at \$0.50. A smart vendor may notice that the excess demand is very likely to lead to higher prices anyway, meaning that if they wanted to sell — they could probably do so at an even higher price than at \$0.50.

Another potential trading decision that could be made by the shopper would be to set a bid for the apple at a price below \$0.49, such as at \$0.48 or lower. The problem with this is that with the present excess demand for a vendor to sell the apple, it is highly unlikely for the price to go below \$0.49. For that to occur, all of the interested apple shoppers willing to buy at \$0.49 would have to either lose interest and pull their orders at that price level or the vendors would have to exhaust all liquidity at \$0.49 (meaning that all of the shoppers' buy orders at \$0.49 were filled by vendors who are selling).

The final trading decision that the shopper has in their arsenal is to buy an apple at the vendor's offered price of \$0.50. This is likely the best option with the information given. If you were to buy an apple at the price of \$0.50, that would leave just one apple to be sold at the price of \$0.50 (recall that only two apples were for sale at \$0.50); however, there would still be ten apples attempting to be bought at the price of \$0.49. At that point, if a shopper bought just one more apple at the price of \$0.50, then there would be no more apples offered at the price of \$0.50. Immediately, the price of an apple would rise higher to the lowest price that a vendor offers to sell.

If the two apples that were offered for sale at the price of \$0.50 were bought, and three vendors were willing to sell an apple for \$0.52 each, then the new bid price would go to \$0.51 and the offer price would go to \$0.52. You may think that, within this apples analogy to the limit order book, it would be typical for an asset that just cleared through an offer level to have the old best bid hold at \$0.49 (as that was the previous bid that the 10 shoppers had set). However, after there are no more potential sellers at the price levels of \$0.50 (as this level was bought out) and \$0.51 (as no vendor offered to sell at this price), it is likely that one of the more aggressive shoppers would want to place a bid at the level of \$0.50 to get their buy order in front of other prospective shoppers. If they do so, they will get their order for an apple filled before the other shoppers would (albeit for



a slightly worse price). Moreover, another shopper can see this happening and then outposition the shopper who bid at \$0.50 by placing a bid at \$0.51. After this occurs - the best bid is at \$0.51 and the best offer is at \$0.52 - these levels will remain until the shoppers buy at the vendor's indicated price of \$0.52 or until the vendors sell at the shopper's indicated price of \$0.51. This is the nature of competitive markets.

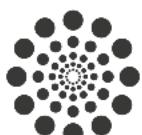
The shopper who bought an apple at \$0.50 was able to take advantage of the supply/demand imbalance as they were able to buy before other shoppers bought. Notice that there is a competition between the shoppers to buy at the best price possible, as well as a competition between the vendors to sell at the best price possible. Assuming the volume per transaction is equal between all shoppers and vendors, when only two vendors are willing to sell at \$0.50, that would mean that only two shoppers would get the opportunity to buy at that price. Thus, the shoppers quickest to react to this demand imbalance would be the traders who were able to buy at the best possible price.

We gauge order depth in the cryptocurrency market in order to locate opportunities of excess demand or excess supply. When you notice that there are many bids but not many offers near the last traded price, try to take advantage of the fact that there are more traders interested in buying than there are traders interested in selling. Take advantage of this by buying before the interested buyers are able to buy.

4.2 Order Depth Imbalance on a Higher Timeframe

To profit in the market, you have to be able to buy before others buy and sell before others sell. Having a strong understanding of the limit order book can help you accomplish this. The order book depth shows us how many traders are looking to buy and how many traders are looking to sell. The larger the bid volume is, and the closer it is to the top bid, the more aggressive the bidders are. The larger the offer volume is, and the closer it is to the bottom offer, the more aggressive the offerors are.

When the bidders are more aggressive than the offerors are in trying to get their limit orders filled, price tends to rise. When the offerors are more aggressive than the bidders are in trying to get their limit orders filled, price tends to fall. This is called an order depth imbalance. We can use these order depth imbalances to locate excess supply or excess demand, so that we can buy before others buy and sell before others sell. There are many ways that you can access order depth information and equally as many different



depth ranges that you can use to look at it at. Let's cover the basics of reading order depth:

% Range: The range of prices that is used for an order depth comparison. For example, if the price of the asset you are looking at is \$1000, then a 1% range would add and display all combined bid volume from \$990 to \$1000 and add and display all combined offer volume from \$1000 to \$1010. If price was at \$1000, a 5% range would display all combined bid volume from \$950 to \$1000 and all combined offer volume from \$1000 to \$1050.

Bid: A limit order to buy. When a market order to sell transacts at the indicated level of the bid, a transaction is made.

Offer: A limit order to sell. When a market order to buy transacts at the indicated level of the offer, a transaction is made.

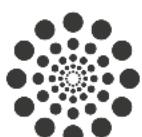
Depth chart: A visual look at the bids and offers of a cryptocurrency.

BAS: The Bid Ask Sum. This shows the historical bids and offers (AKA "asks") of a cryptocurrency.

MDR: The Market Depth Ratio: This shows the ratio of bids to offers of a cryptocurrency or of a group of cryptocurrencies. It is calculated with this formula: $((Bids - Offers) / (Bids + Offers)) \times 100$. MDR can be used in place of BAS so that an order depth imbalance can be graphed on just one line instead of two.

Take note, the examples used throughout the rest of this guide will mostly come from websites that are free to use and available online. In the future, these sites might not be free to use and/or may not be running. However, the same concepts still apply regardless of the site that is used for data. If you can understand what these indicators are showing you, and can also identify the significance behind their readings, then you can apply that knowledge on any order depth data set that you use.

The chart below shows the BAS on the 5% range of the last 30 days. I believe that one of the best free sites to currently look at the BAS is [bitcoinity.com](https://www.bitcoinity.com/). Recall that when the bids and offers are shown historically that the 5% range is *calculated based on the price traded at that historical point in time*. The line in green represents the combined bid



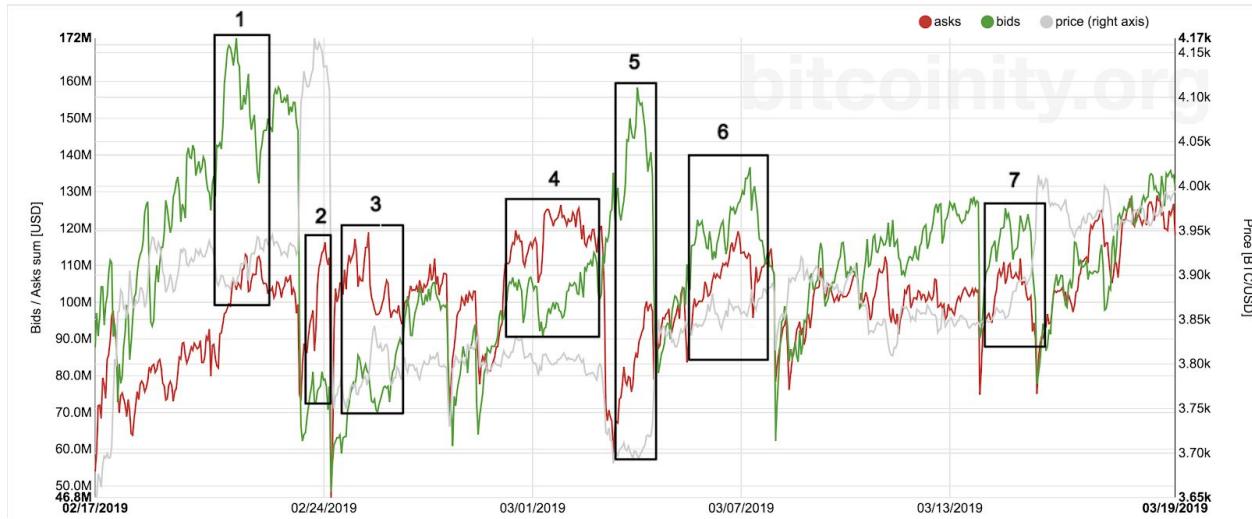
volume, the line in red represents the combined offer volume, and the line in gray shows the price of XBTUSD on Bitmex. The y-axis on the left side shows the total combined volume of the bids and offers in contracts worth of XBT and the y-axis on the right shows the price of BTCUSD ($k = 1000$, so $3.9k = 3900$).



Notice that most of the time the bids were greater in volume than the offers (you can see the green line is above the red line at that point in time), price rose. This goes back to our analogy on apples when there were more interested shoppers, i.e. more bidders than interested vendors/offerors. Additionally, almost every time that the offers were greater in volume than the bids (you can see the red line is above the green line at that point in time), price fell.

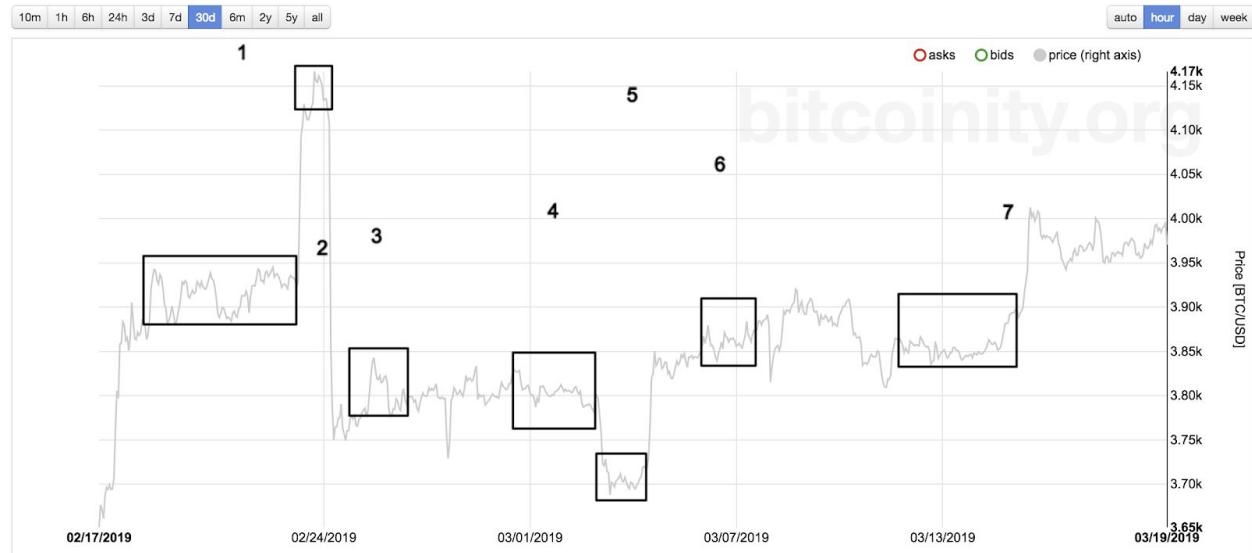
Here is an annotation of each significant difference between the bids and offers and the change in price as a result.





If it was hard to see the change in price with the bid and offer overlay, then take a look here of each price zone indicated:

Bid/ask sum within 5% range from the price



Point 1: The bid volume is much greater than the offer volume throughout this period and price moves higher as a result.

Point 2: After price rises to a high of around 4170 (4.17k), the offer volume grows much larger than the bid volume. Price falls even more violently than it rose before from 4170 down to a new low of 3700.



Point 3: Price retraces higher, however, the offers move far above the bids once again. Consequently, price falls from around 3850 down to around a low of 3750.

Point 4: Price moves sideways for some time until the offers regain their strength and rise far above the bids once again. Price falls from its high made at 3820 down to a low of around 3640.

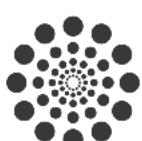
Point 5: Price falls as the bearish order depth pushes price lower. Then we see immense bidding dominance as the bids soar higher than the offers. During this short period of consolidation at around the price of 3700, we had bid volume at \$155 million and offer volume at \$65 million. The difference between the bids and offers led to a strong uptrend that has continued up to the present time in the chart above.

Point 6: After price reverses from the consolidation around the price of 3700 up to the high at 3870, we continue to see strong bidding pressure. However, price dips down to 3820 before rising to 3920. The dip down to 3820 was not expected or predicted by an imbalance in order depth. These price moves can happen and it is important to remember that no strategy works every time.

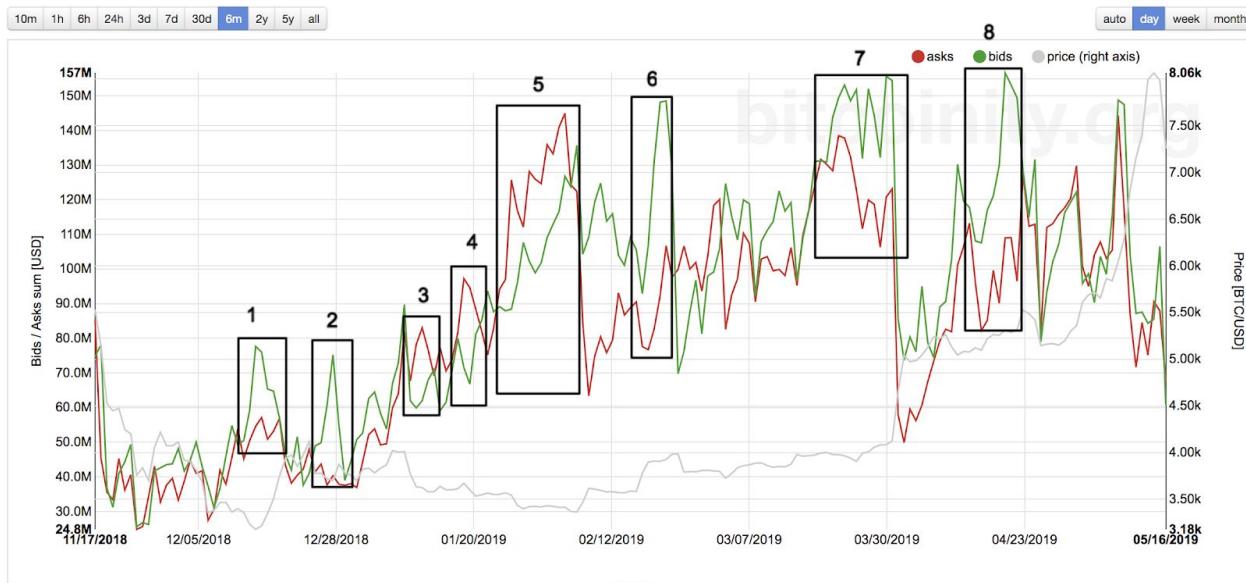
Point 7: We see a prolonged period of tight consolidation, as well as a period of time where the bid volume was consistently greater than the offer volume. Price naturally moves far higher in an uptrend. Note that the bids remain larger than the offers throughout this uptrend.

On reflecting on this 30 day period of tracking order depth imbalance, we can see that price followed the dominant order depth 6/7 times (meaning that price rose when bids were greater than the offers/price fell when offers were greater than the bids at the indicated points).

Here is another example of the Bitmex 5% BAS in action, on the 6 month timeframe.

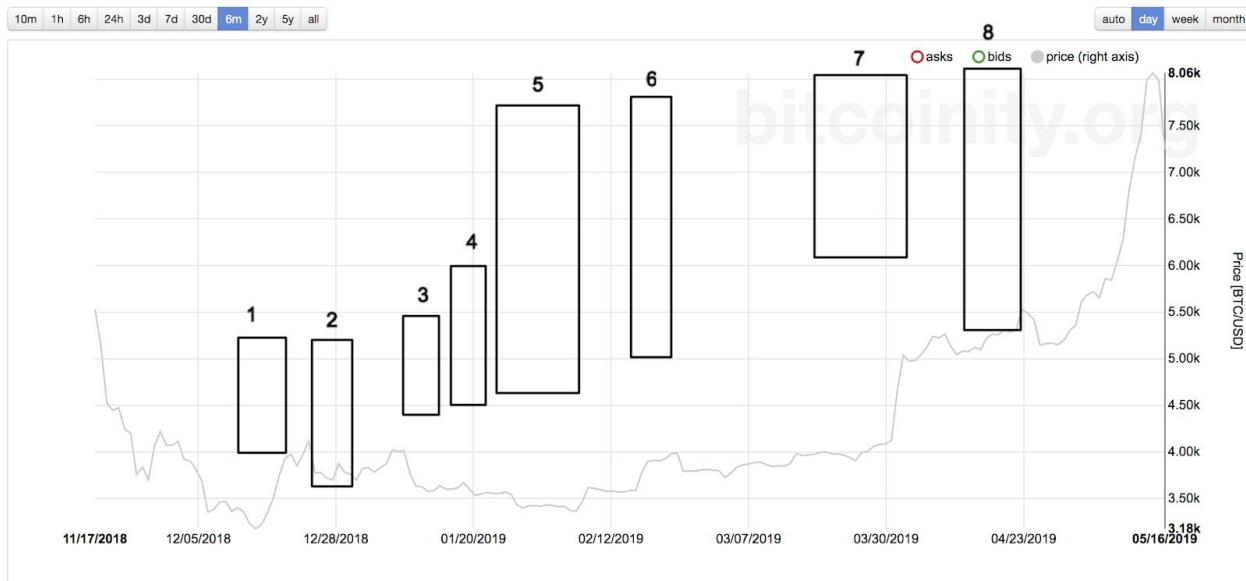


Bid/ask sum within 5% range from the price



If it was hard to see the change in price with the bid and offer overlay, then take a look here of each price zone indicated:

Bid/ask sum within 5% range from the price



Point 1: The bid volume is much greater than the offer volume after the price dip and price moves higher as a result.

Point 2: Same story as Point 1. Price rises and then retraces and the bids remain strong.



Point 3: The offer volume grows far larger than the bid volume and price falls.

Point 4: Price falls a bit lower and then another large order depth imbalance appears as there is excess supply. Price continues its descent.

Point 5: As price continues to fall, the offers remain larger than the bids. Price begins to stall after its fall and the bidders eventually grow stronger than the offerors.

Point 6: The bid volume is significantly larger than the offer volume as there is excess demand. This is the largest order depth imbalance that appears throughout this 6 month period. Price rises.

Point 7: Even after the gradual price rise, the bids remain larger than the offers. The offers begin to fall off in volume and suddenly, price pushes aggressively higher.

Point 8: After the large price rise, we see a period of consolidation. During this indicated point of consolidation, the bids once again grow much larger in volume than the offers. Price continues its ascent far higher.

Trading order depth imbalances (locating excess supply/excess demand) on higher timeframes can allow you to zoom out and gauge what the order depth has been for a period of hours or days, rather than minutes, which may better supplement a swing trader or a position trader's style. Checking the BAS around 1-2 times a day can provide you with the opportunity to locate these order depth imbalances and look into potentially opening or closing a position.

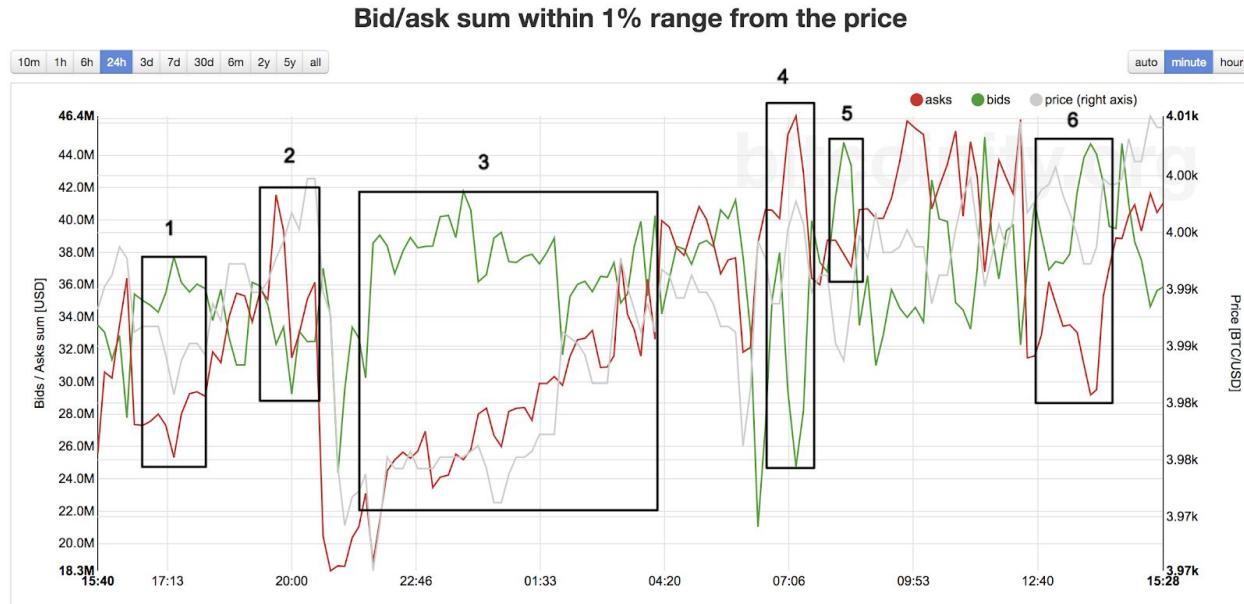
4.3 Order Depth Imbalance on a Lower Timeframe

When looking at order depth on higher timeframes, such as the 30 day or 7 day, it's best to look at the 5% order depth or higher. However, when looking at lower timeframes for scalping and day trading, it can be better to look at ranges lower than the 5% (especially for coins with large market caps, such as Bitcoin and Ethereum).

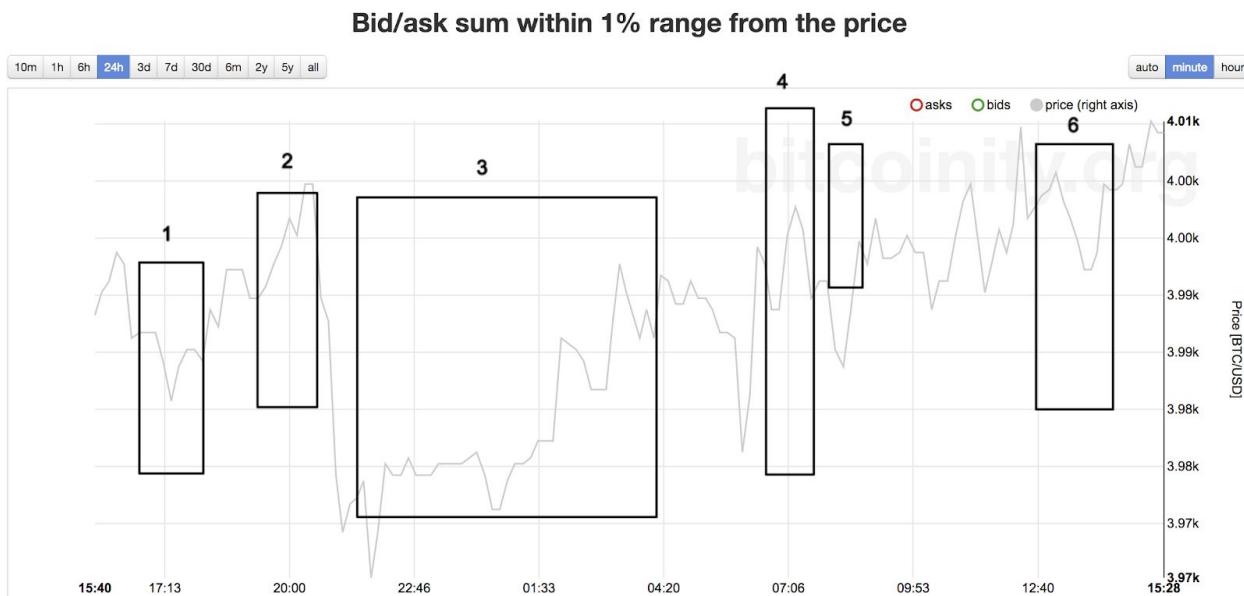


Short-term order depth can be best for predicting short-term price moves that can allow for scalpers and day traders to profit.

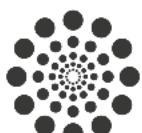
Here is another look at the Bid Ask Sum, but on the 1% range of the last 24 hours.



And here is price with the same indicated order depth points.



Point 1: The bid volume is greater than the offer volume after price fell and price moves higher as a result. The change in price was from 3982 to a high in point 2 of 4000.



Point 2: The offer volume is greater than the bid volume as the offer walls grow in volume around the price of 4000. Price falls rapidly in the short-term from 4000 down to a low of 3970.

Point 3: The difference between the bid volume and the offer volume surges as the bids dominate and price begins a steady uptrend.

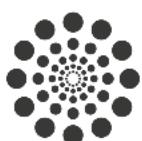
Point 4: Price continues to move higher until once again offer walls around the 4000 level pop up and force price back down. Price moves from a high of 4003 down to a low of 3988.

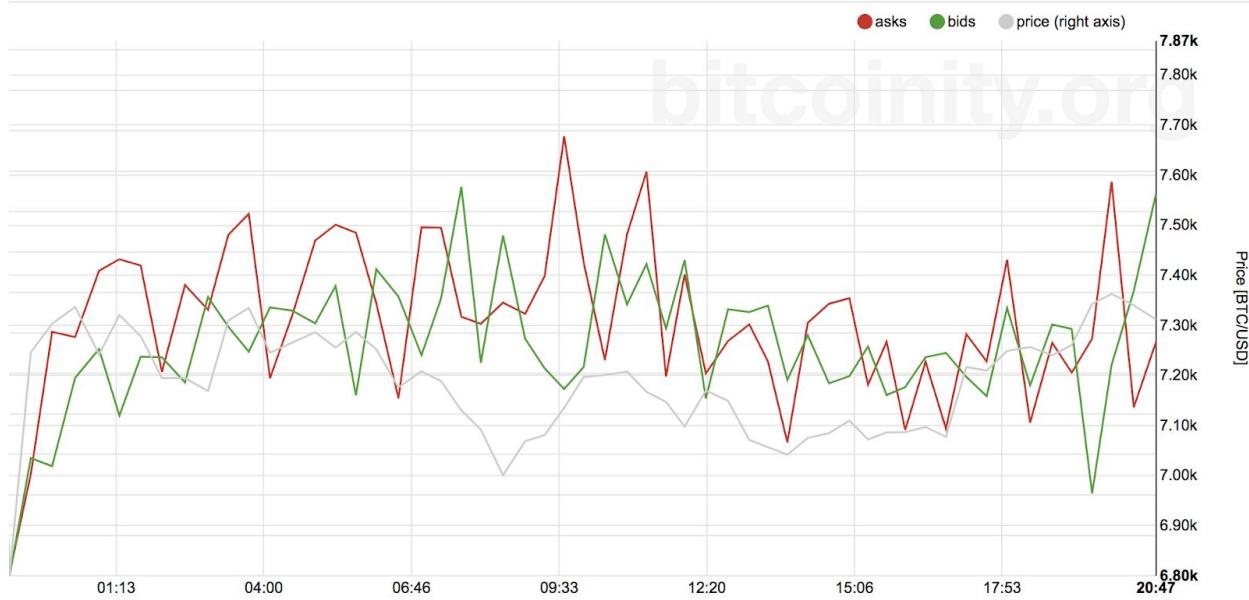
Point 5: After a slight price dip, the bids grow in volume and outnumber the offers. Price rises from its low at 3988 back to 4002.

Point 6: The point highlighted shows that once again price falls a slight amount and bidding pressure dominates over offering pressure. Price responds by moving from 3993 to 4011.

Each one of these indicated points would have worked out well if you had tracked the order depth and took trades when the order depth imbalance had become large enough.

Take a look at another collection of short-term BAS points. Chart is the 24h with the 1% XBTUSD BAS.





Each time the offer volume was significantly larger than the bid volume, price fell. Each time the bid volume was significantly larger than the offer volume, price rose (there was only one clear price spot where the bids were larger than the offers - at around 7:00 to 8:00).

Overall, looking at the bids and offers of a single coin from a single exchange (using the tool that was shown in these last two sections) can give you a strong gauge of the supply/demand on that asset. However, you may find that using additional order depth indicators, in conjunction with the XBTUSD BAS, tends to lead to better trades. Therefore, the remainder of this chapter will focus on other sources of data that you can use for order depth, as well as provide an arsenal of strategies that you can tailor into your own trading style.

4.4 Order Depth Imbalance across Markets

The Bid Ask Sum (BAS) shows us market depth on one exchange and on one market specifically. You can use this order depth on any exchange that you trade on: Bitmex, Coinbase Pro, Bitfinex among others. There is another way that you can look at order depth as well - called the Combined Market Depth Ratio (MDR).



The MDR looks at multiple markets and trading pairs and adds together the bids and offers within the specific % range that you select. It is calculated by the formula: $((\text{Combined Bids} - \text{Combined Offers}) / (\text{Combined Bids} + \text{Combined Offers})) \times 100$. The site that best collects and publishes this data is VCdepth.io.

The reason that we prefer to look at MDR and the historical bids and offers (BAS), as opposed to a normal exchange depth chart, is because it is crucial to gauge the correlation between historical order depth and the changes in price across different coins. You may look at the depth chart for BNBBTC on Binance for example:



Within this constantly changing order depth on BNBBTC, you can easily spot where the bid and offer walls are and you may spot that there is currently more bidding strength than offering strength overall. However, this normal order depth chart on the exchange does not reveal many key facets of order depth, such as:

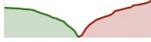
1. How long a limit order has been resting at a certain price level.
2. How often the price of that asset has moved in the direction of the dominant order depth or against it.
3. How long either the bids/offers have been larger or smaller in volume than the offers/bids.



All three of these details are crucial in spotting order depth imbalances and picking up on high probability order depth trading opportunities. This is why we must look at the MDR.

There are two ways that you can look at the MDR: You can look at either a specific coin's MDR or the global combined MDR.

A coin's specific MDR gives you information on all exchanges and trading pairs for that coin. For example, let's use ADA as an example. The site will pull data from multiple exchanges such as those shown below.

Exchange	Price	Bids	▼	Asks	24hrVolume	Market Depth
Binance	\$0.052	\$2,755,292.19		\$3,511,956.08	\$20,127,411.012	
Hitbtc	\$0.052	\$916,769.69		\$876,169.16	\$3,118,964.62	
Bittrex	\$0.052	\$750,615.16		\$405,473.33	\$1,073,309.95	
Huobi	\$0.052	\$296,117.23		\$411,051.37	\$8,558,099.42	
Kraken	\$0.052	\$241,675.51		\$294,760.85	\$318,699.59	
Bithumb	\$0.052	\$235,825.69		\$174,695.65	\$1,456,866.14	
Okex	\$0.052	\$141,784.67		\$57,895.3	\$1,202,853.89	
Upbit	\$0.052	\$114,495.56		\$127,577.53	\$551.061	
Cryptopia	\$0.04	\$6,044.84		\$10,121.31	\$13,242.34	

Within each exchange that allows ADA to be traded on a limit order book, the MDR also adds together the order depth of all pairs for that coin. That includes ADABTC, ADAETH, ADAUSDT, among others. This gives us fantastic insight into how many traders want to buy or sell a coin within a specific range which gives us the likely direction that a coin will be moving toward in the future.

The global MDR gives you information on all exchanges and trading pairs for all coins traded on exchanges. This includes Coinbase (BTCUSD), Bitfinex (BTCUSD), Binance (BTCUSDT), Bitfinex (ETHUSD), as well as every major trading exchange and all of their trading pairs. As of this writing, the global MDR from vcdepth tracks 5745



different markets. Therefore, the global MDR is best used to gauge where most cryptocurrencies will trend toward, especially Bitcoin.

If we see that the global MDR is very bullish, meaning that there are many more bids than offers, we know that the price of Bitcoin and that the majority of other cryptocurrencies are likely to move upward. Additionally, if we see that the global MDR is very bearish, meaning that there are many more offers than bids, we know that the price of Bitcoin and the majority of other cryptocurrencies will likely move downward.

Take a look at the correlation between the global combined MDR on the 5% range and the subsequent change in price of Bitcoin. Each highlighted point shows when the bid volume was much larger than the offer volume or when the offer volume was much larger than the bid volume.



The Green line represents the bids and the red line represents the offers. The line above in blue is NOT price, rather it is the combined order depth of bid volume + offer volume.





Point 1: Price is consolidating and a very bullish MDR emerges as the bids rise far above the offers. Price rises on a strong uptrend from 3950 to 4200.

Point 2: Price retraces upward after a massive downtrend. As price moves upward, the offers rise above the bids. Price then falls from the high made at 3845 down to a low of 3640.

Point 3: Price falls and we then see a short period of consolidation. As this consolidation occurs, the bids remain consistently above the offers which gives a bullish MDR. Price then rises from its low at 3670 up to a high at 3940.

Point 4: Price makes consistent moves lower. However, during this period notice the drop in offers and bids. The offer volume drops more than the bid volume, and price rises as the bids remain dominant above the offers.

Point 5: Price rises as the bids remain consistently above the offers from Point 4 up to Point 5. At Point 5, the difference between the bids and offers grows immensely and we see strong bidding pressure. The result is that price rises from a low at 3925 up to a high of 4070.

Let's take a look at coin-specific MDR. The global MDR that is shown above shows the bids and offers; coin-specific MDR shows the actual MDR value. When



looking at a coin specific MDR, there are three strategies that we can use to gauge the bullishness/bearishness of the market to determine the direction of our trade:

1. MDR Spikes

- a. When MDR spikes upward, this is a bullish sign.
- b. When MDR spikes downward, this is a bearish sign.

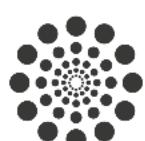
2. MDR Flips

- a. When MDR flips from a prolonged period of negative MDR to a positive period of MDR, this is a bullish sign.
- b. When MDR flips from a prolonged period of positive MDR to a negative period of MDR, this is a bearish sign.

3. MDR Thresholds

- a. When MDR has made a historical high, we gauge a break of that MDR high as bullish.
- b. When MDR has made a historical low, we gauge a break of that MDR low as bearish.

Always keep in mind that everything is relative. Looking at the *MDR Spikes* Strategy above, you should gauge any spike in the MDR back to historical spikes.

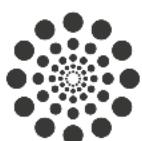


In the example above, which changes in the MDR would you call a significant short-term spike either upward or downward? Hint: look for periods where the MDR changed rapidly in a short period of time.



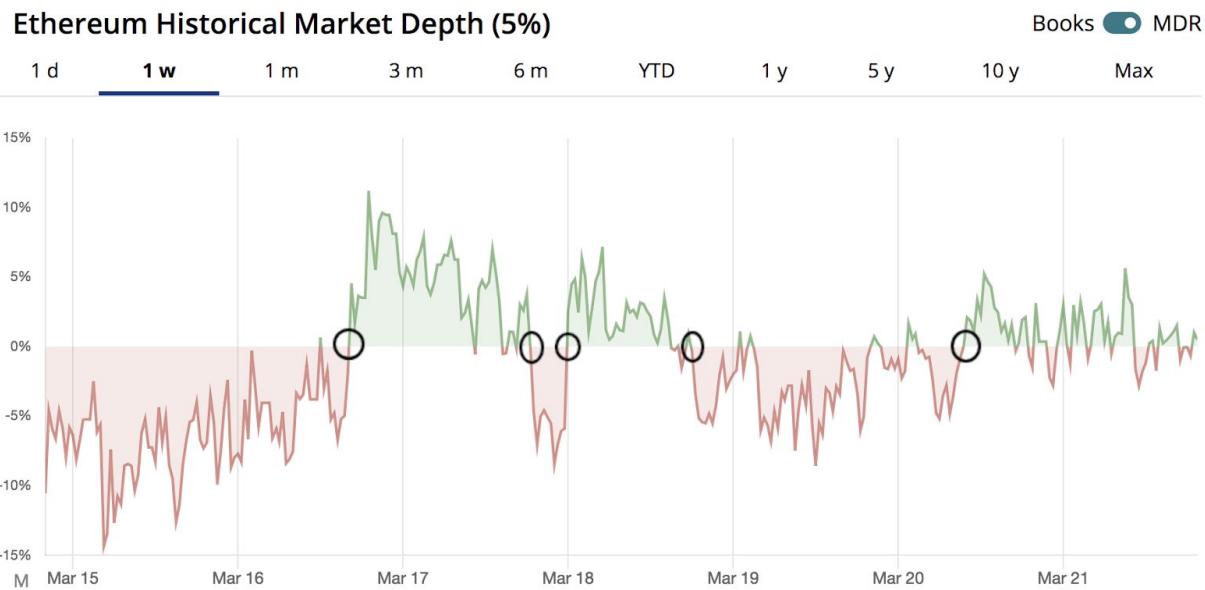
Shown above are short-term spikes in the MDR in both the upward and downward direction.

Within the *MDR Flips* Strategy of locating a prolonged one-sided MDR value that then changes, you should always gauge any flip that you see in the MDR back to past flips of the MDR on that coin.





In the example above, what would you call a significant flip in the MDR? Hint: this occurs when the MDR rises from negative to positive, and then continues rising to more positive values OR when the MDR falls from positive to negative, and then continues falling to more negative values.



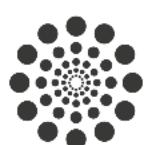
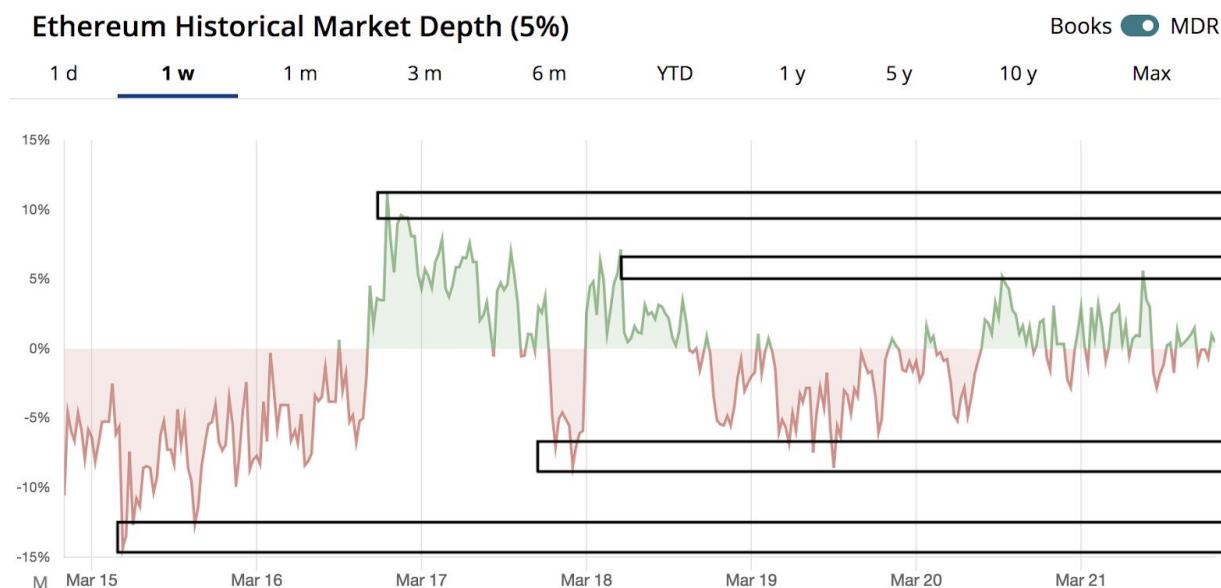
In this example, there were five times that the MDR flipped on a significant spike. Notice that not each of the actual MDR flips were circled — this was intentional, as we are only interested in analyzing MDR when it made a significant enough flip of the MDR value.



Within the *MDR Thresholds* strategy, you should always gauge any new high or low made in the MDR back to its historical highs and lows. Personally, I have found this third strategy to be the strongest of the three strategies for interpreting the MDR.



In the example above, what historical MDR levels would you deem significant?

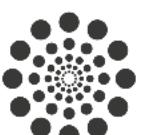


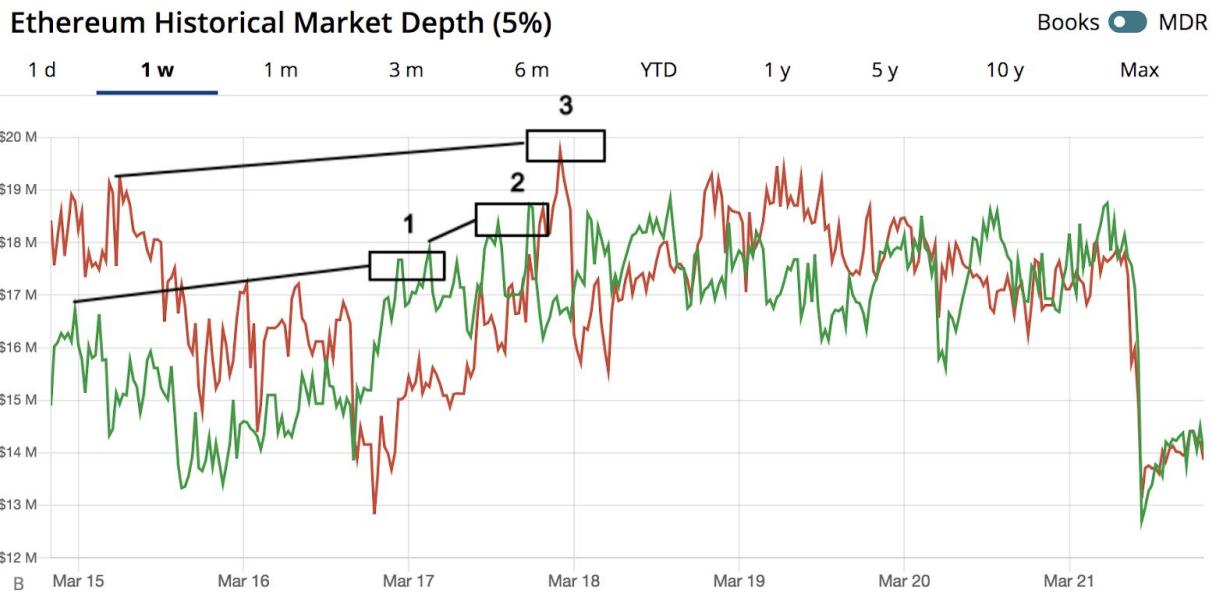
In this example, there were two MDR highs and two MDR lows that I found significant. If MDR reaches one of the indicated highs again, then I would expect price to rise. If MDR reaches one of the indicated lows again, then I would expect price to fall. The two indicated MDR highs are at the levels around 5% and at 10% and the two indicated MDR lows are at the levels around -8% and at -14%.

Marking significant highs and lows within the MDR carries a certain degree of subjectivity (as can be seen in the figure above with 4 marked MDR values). To prevent this subjectivity, mark the lowest value that MDR made and the highest value that MDR had made in your given timeframe. If the MDR breaks that MDR high, you can expect price to rise. If the MDR breaks that MDR low, then you can expect price to fall.

Beyond using the VCdepth solely for its MDR tool, we can also look for historical highs and lows made within the bids and offers of a coin. This means that instead of looking at MDR, we are looking at BAS again: the bid volume and offer volume on two separate lines.

Take a look at Ethereum's order depth. Focus on when the bids reached their highest high and when the offers made their lowest low.





In the example above, the broken highs and lows of the bids and offers are boxed. The graph indicates each time the cumulative offers made a new high (at point 3) and each time the cumulative bids made a new high (at points 1 and 2). The left portion of each line shows the previous bid/offer high and the right portion of the line shows the new bid/offer high made.

Point 1:



Look back at the bids on point 1 as indicated on the order depth chart. The previous bid volume high was at \$16.8 million, and then rose to \$17.8 million. At this point in time at 23:00 on March 16th (arrow above), price rose.



Point 2:

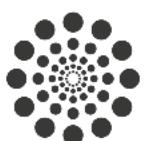


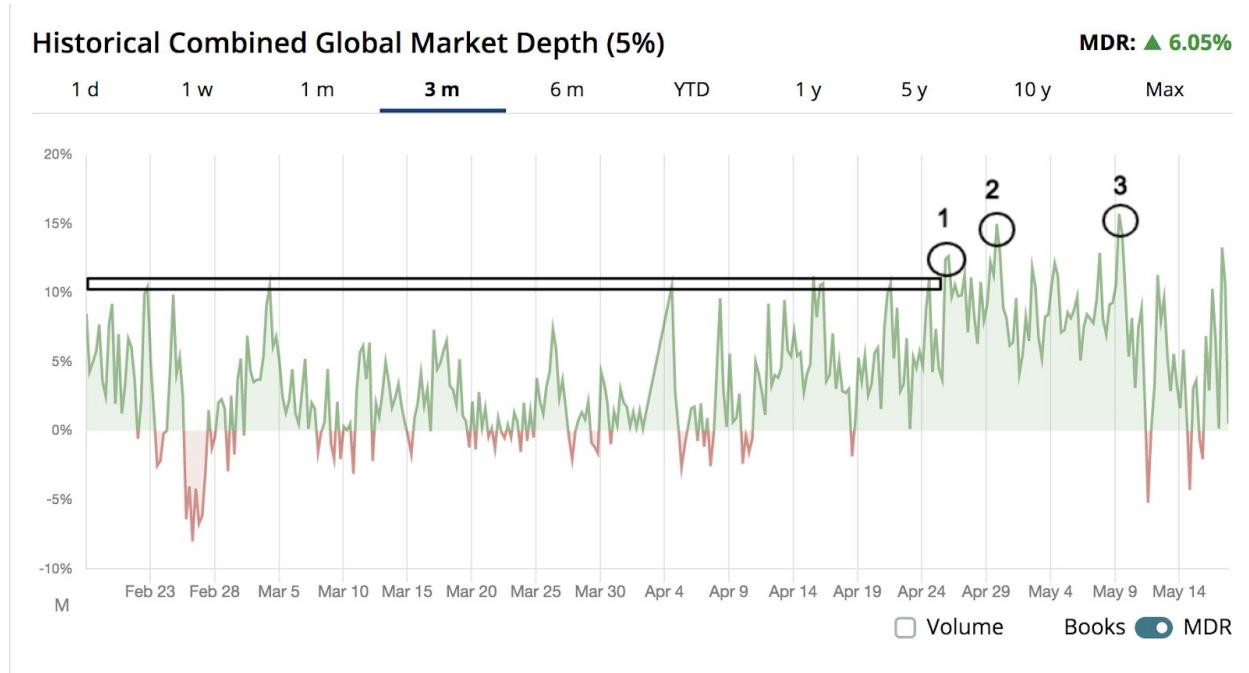
Look back at the bids on point 2 as indicated on the order depth chart. The previous bid volume high was at \$17.8 million (bid volume at point 1), and then rose to \$18.4 million. At 13:00 on March 17th (arrow above), price rose.

Point 3:



Look back at the offers on point 3 as indicated on the order depth chart. The previous offer volume high was at \$19.2 million, and then rose to \$19.8 million. At this point in time at 22:00 on March 17th (arrow above), price fell sharply. Of the three order depth signals, point 3 would have yielded the largest profit by far as price declined from a price high of 141.75 down to a price low of 132.





Take a look at the figure above and the previous MDR high threshold that was broken at point 1. This high was broken again at point 2 and then once more at point 3. Points 1 and 2 occurred during a flat period of consolidation, whereas point 3 occurred deeper into the uptrend (as shown below). This type of pattern of consistently broken MDR highs can be read as quite bullish.



Points 1, 2, and 3 of the MDR are shown above on a daily Bitcoin price chart.



MDR is no better or worse than BAS at relaying relevant order depth data. However, do note that MDR aggregates the bids and the offers into one percentage line, whereas the BAS data shows both the bids and the offers individually. While constructing a trading strategy from either, it may be best to check whether the BAS or the MDR on a coin backtests better before trading live, or reference both in tandem to ensure that nothing is being missed within the order depth.

4.5 Order Depth Trading

Interpreting order depth and locating an order depth imbalance provides insight into how many traders would like to buy or sell, which can give you the likelihood that price will be moving higher or lower. The closer that the order imbalance is to the currently traded price, the more pressure that is put upon price which enhances the probability that price will follow that order depth in the short-term.

This means that when looking at the 1% BAS or the 1% MDR, you can predict whether price is more likely to rise or fall in the short-term based on an order depth imbalance. This can be key for looking for predicting supply/demand runs before they occur, as well as for scalping opportunities. On the other hand, when looking at the 5% BAS/MDR, you can predict the medium-term and long-term probability that price will rise or fall.

Although the 1% can provide great short-term order depth data with medium and small cap altcoins, the 5% may work better. This is because the order depth of a smaller cap altcoin might not have an efficient order book where the best bid and offer are consistently one tick apart. Additionally, if an altcoin has a price of .000001 BTC then the 1% range would only show bid depth from 00000099 to 000001 (two ticks of price) and offer depth from 000001 to 00000101 (two ticks of price). The 5% range would show bid depth from 00000095 to 000001 (five ticks of price) and offer depth from 000001 to 00000105 (five ticks of price). Consequently, always look at the amount of liquidity near price, as well as the amount of ticks that an order depth indicator is actually accounting for.

For example, imagine that XBTUSD is priced at 10000. XBTUSD is highly liquid and the best bid and offer are mostly one tick apart. The 1% order depth would



show the bid order depth from 9900 to 10000 (200 ticks, as each tick on XBTUSD is .5 dollars) and the offer order depth from 10000 to 10100 (200 ticks). The 1% order depth is much more revealing on this coin than it would be on other coins.

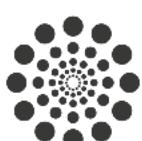
Recall that it is typically not advised to rely on the normal depth chart located on many exchanges (such as the BNBBTC depth chart from earlier in this chapter). Rather, it is better to go to alternate websites that pull order book data historically. However, in a later chapter we will go over how to use normal order depth charts for the purpose of locating bid and offer walls.

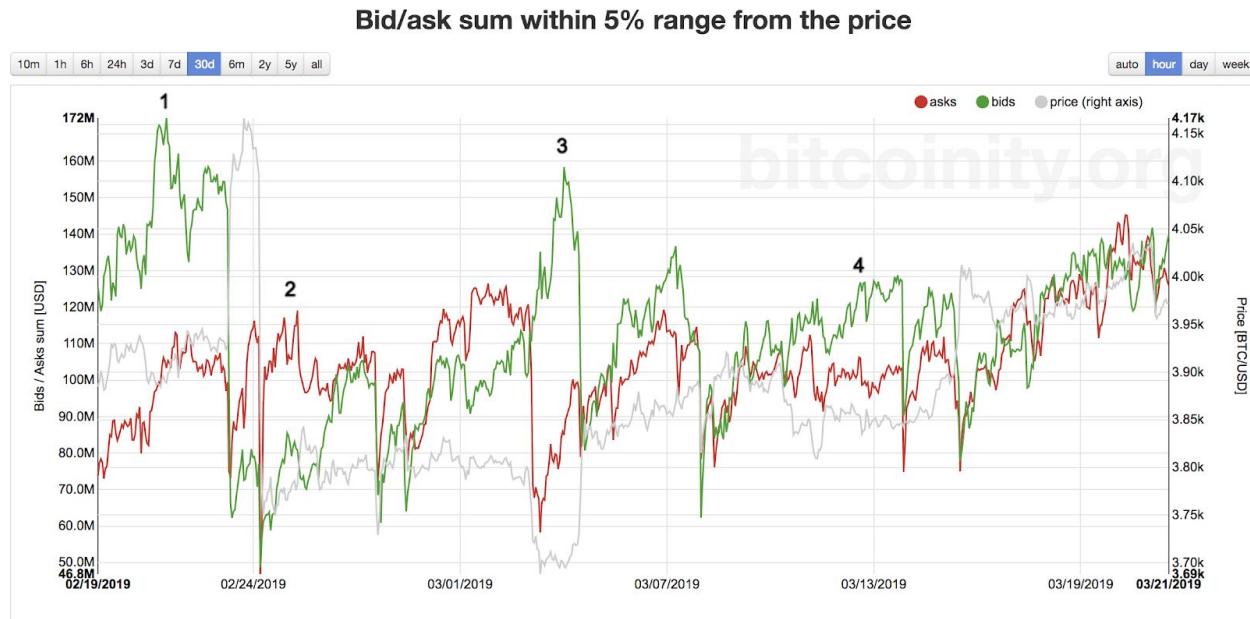
Analyzing both the 5% range BAS on Bitmex and the combined order depth of the global 5% range MDR can help you to locate high probability plays. This means that when the 5% BAS on Bitmex XBTUSD has more bidding volume than offering volume, and the global 5% MDR has a positive bullish MDR value, then price is likely to rise.

The reason why these two tools work quite well together is that the global MDR mostly tracks order book data from spot exchanges, not futures exchanges (we can track futures by looking at the BAS of Bitmex's XBTUSD or other order depth indicators that incorporate XBTUSD).

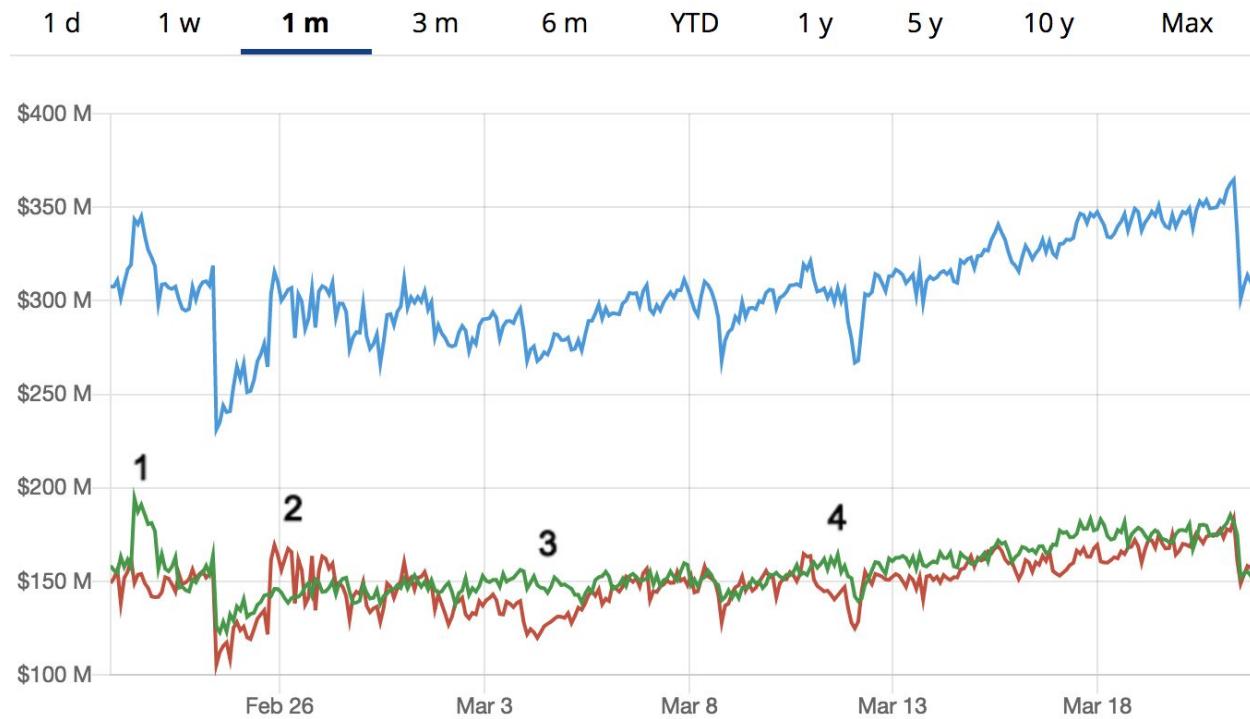
In a spot exchange, the cryptocurrencies themselves are electronically transacted between a trader who would like to receive a cryptocurrency and a trader who would like to receive fiat/different cryptocurrency in exchange at a specified price. Within a futures exchange, cryptocurrencies are not directly transacted, but rather a contract that represents a cryptocurrency is transacted. The benefit of trading futures is that these special contracts allow one to magnify the effect of the change in the price of the cryptocurrency that is being traded. In essence, futures trading allows speculators the ability to bet on the future value of an asset with leverage.

Let's take a look at scenarios in which the Bitmex BAS was in confluence with the global MDR.





Historical Combined Global Market Depth



Take a look at points 1, 2, 3, and 4. Each time that both were in confluence, price moved in that direction. In points 1, 3, and 4, price rose as the bidding pressure was greater within both the BAS and the global MDR. In point 2, price fell as the offering pressure was greater within both the BAS and the global MDR. Of the multiple points of

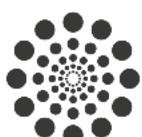
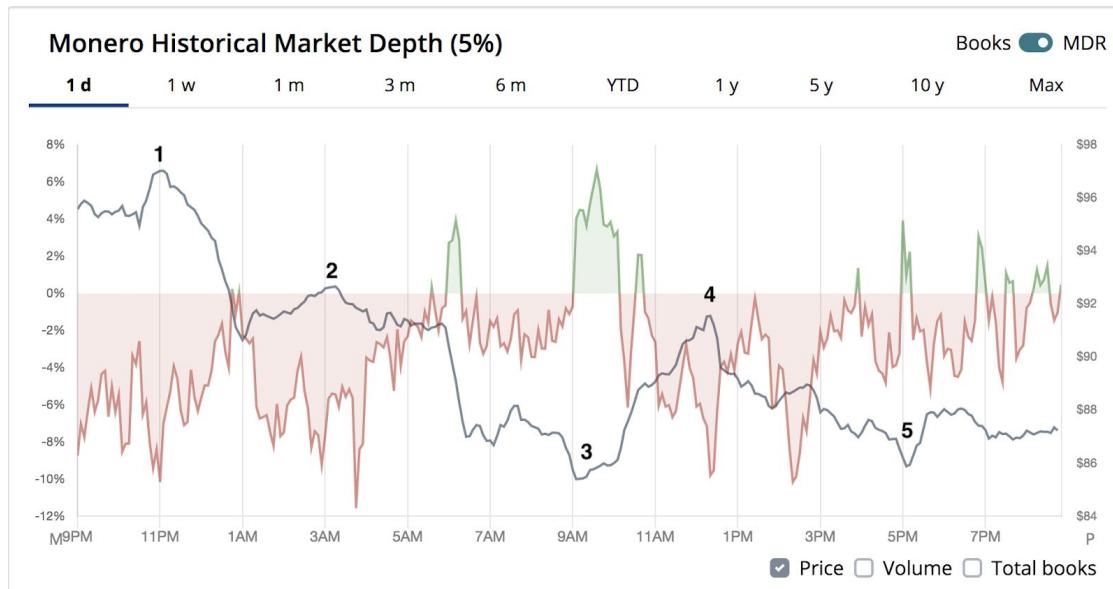


confluence, point 1 led to the quickest gain in price and point 3 led to the largest sustained gain in price. We use these two different order depth indicators together so that we have supply/demand data on both the XBTUSD (perpetual swap) futures rate of Bitmex as well as order depth data from cryptocurrencies of other exchanges.

A trading strategy that you can use is to only take trades using order depth indicators when they are in concert with one another. If you would like to get more aggressive and not wait for confluence, you can use other indicators or your knowledge of price action and volume patterns to initiate a trade.

Much of this chapter has maintained a focus on cryptocurrency futures, such as the XBTUSD contract and the ETHUSD contract from Bitmex. However, you can also use order depth on coins besides XBTUSD and ETHUSD, primarily by looking at the multi-exchange order depth offered by Vcdepth.io.

Take a look at the XMR order depth below. Notice how well the 5% order depth worked on the 1D chart. A strong negative MDR led to bearish price movement and a strong positive MDR led to a price rise. Take a look at the negative order depth at 11PM (far left portion of the chart) and the 4 AM just after that - both led to a continued price descent. Also, take a look at the positive order depth at 10 AM and how that led to a price rise.



In points 1, 2, and 4, the MDR was quite bearish and price fell. In points 3 and 5, the MDR was bullish and price rose.

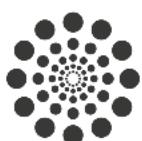
Another reason why there is a lack of order depth examples for medium market cap and smaller market cap altcoins is due to the amount of market spoofing that can occur on altcoins of that smaller size. When actively trading large cap cryptocurrencies, not only is it harder for market participants to spoof due to the massive volume and liquidity of large caps, but there are also other sources of order depth that can provide confluence for large cap coins as well.

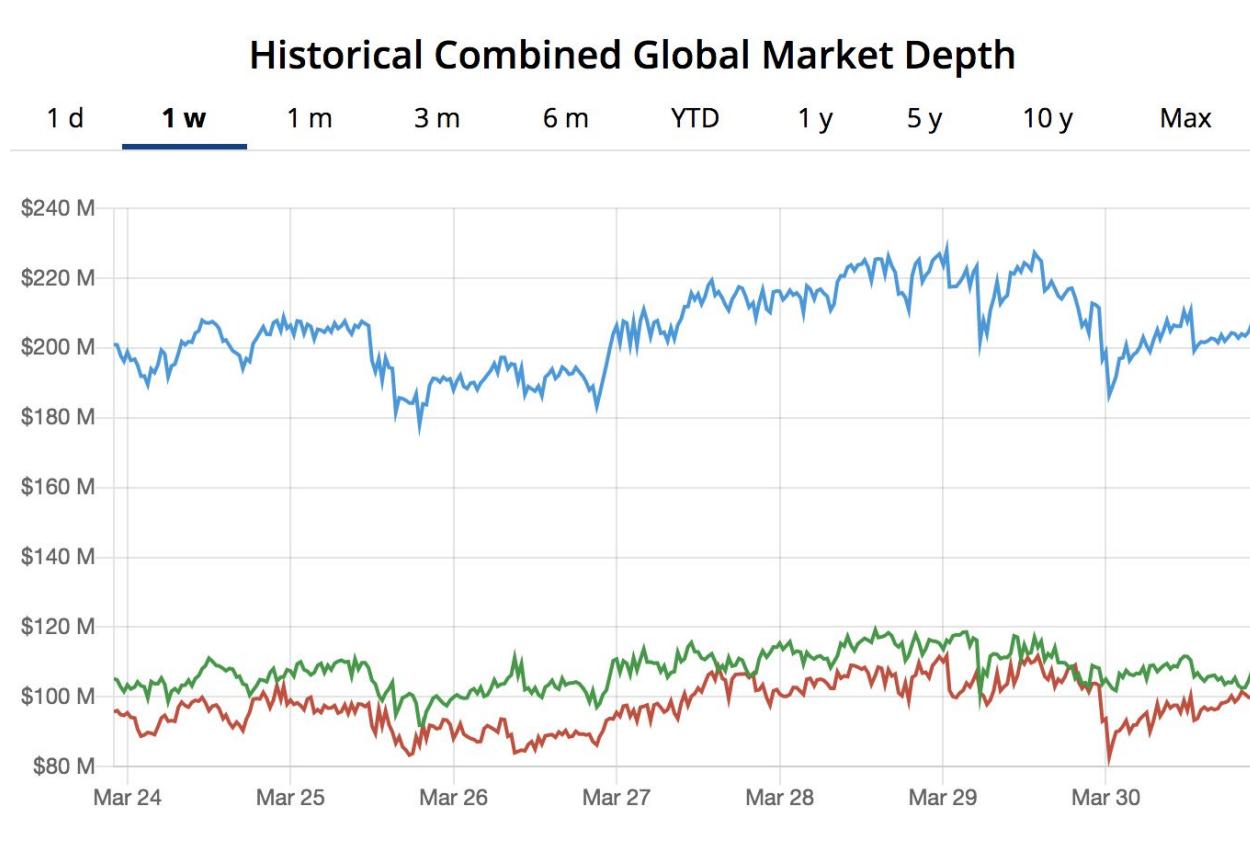
4.6 Executing on Order Depth

As touched upon briefly in the previous section, confluence allows a trader to actively use order depth in a trading system. Here are strategies that one can use to locate confluence:

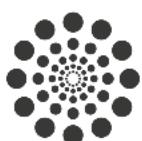
1. Confluence between global spot cryptocurrency exchanges and Bitmex: Use the 2.5% global MDR to gauge whether the MDR is positive or negative. Use the 2.5% Bitmex BAS (or another Bitmex BAS range under 5%) to gauge whether the MDR is positive or negative. Both order depth indicators pointing in the same direction can signal great opportunities. On a side note, you can also use other % order depth ranges for this, as long as they are the on same range (meaning that you are looking at the 5% BAS and the 5% Global MDR).

Shown below is the 2.5% Global MDR on the weekly timeframe. The past week, it was bullish throughout and price rose. To properly time this coin, we would want to also look at the 2.5% Bitmex BAS. If both are bullish, we can think about buying. If both are bearish, we can think about selling.





Shown below is the 2.5% Bitmex BAS. The green line represents the bids, the red line represents the offers, and the candlestick chart above the BAS shows the price. The timeframe is in sync with the 2.5% global MDR above. The two highlighted points denote where the bid volume became larger than the offer volume. Each time this occurred, the global 2.5% MDR (chart above) remained bullish. This means that each bid flip (where bids overtake offers as seen below in the white boxes) would have been a great time to buy.



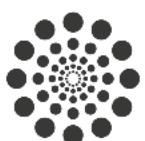


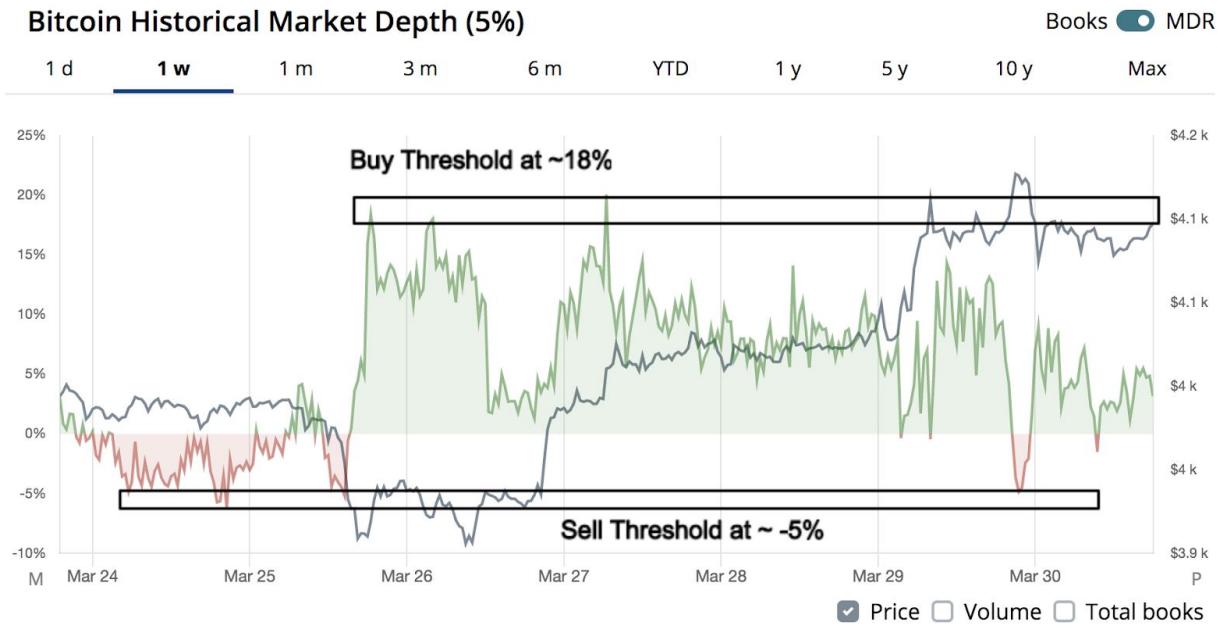
Advantage = You get short-term order depth data on Bitmex's XBTUSD and on all cryptocurrencies.

Disadvantage = Any major spoof on an altcoin can throw off the global cryptocurrency MDR.

2. MDR Thresholds: Looking at the MDR of a specific cryptocurrency, take a look at the maxima and minima that MDR had within that timeframe (1D or 1W). Also take a look at how price responded when that maxima or minima was reached. After locating these thresholds, take a trade if the MDR moves past that threshold.

I assigned the threshold below of +18% and -5% as that made up the local maxima and minima of the 5% range MDR respectively. Take a look at the trades that could have been taken if you had bought whenever MDR topped above 18% and had sold whenever MDR moved below -5%: it would have led to great medium-term price zones to buy from. If the MDR reaches the value of -5% again, it will likely be a good time to sell. If the MDR reaches +18% again, it will likely be a good time to buy. In the graph below, price is represented in blue, with the right y-axis denoting price values.



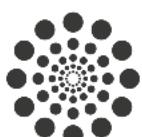


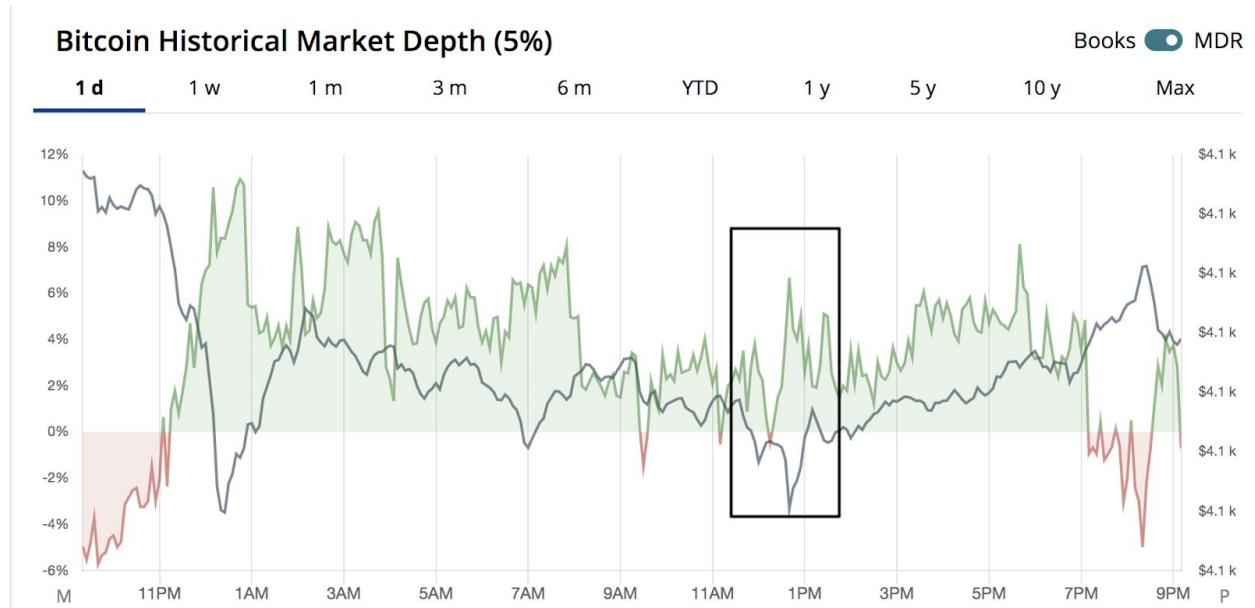
Advantage = You are able to put the MDR into perspective and turn it into a trading strategy with specific entry/exit points once an order depth threshold is reached.

Disadvantage = Markets change and so does order depth. The MDR might not reach your threshold for some time, which would mean that you would have to assign new thresholds.

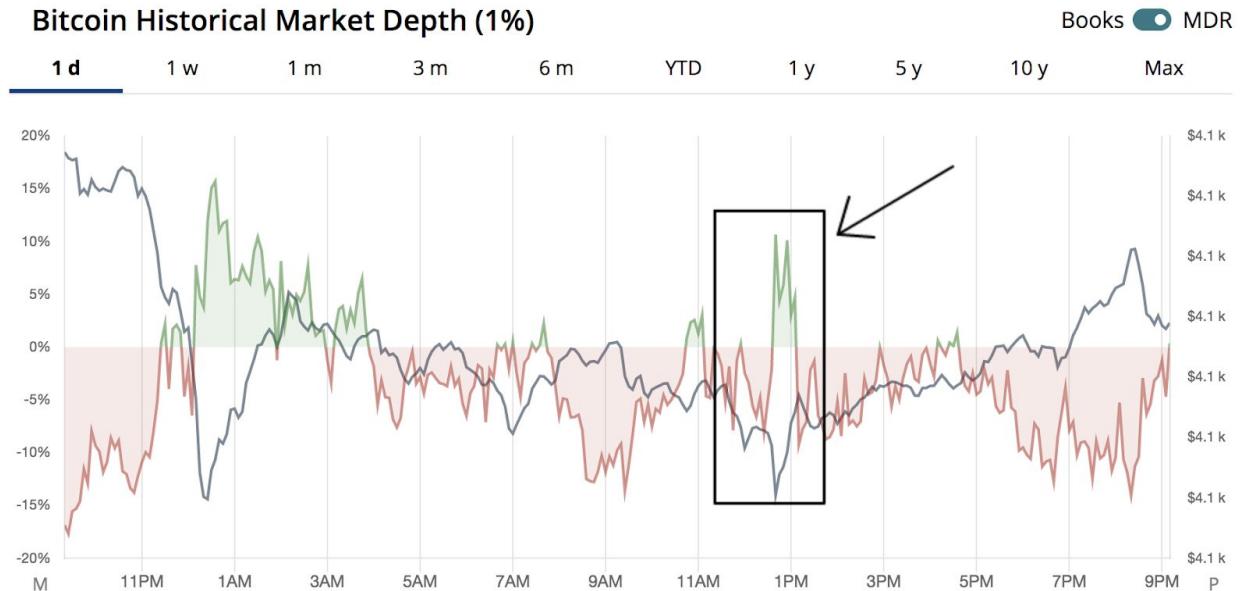
3. Master of spot BTC: Look at the BTC MDR on its 5% and 1%. Use the 5% BTC MDR to gauge how bullish or bearish Bitcoin is at the moment. If the 5% is bullish, you are going to wait until the 1% BTC MDR turns bullish to buy. If the 5% is bearish, wait until the 1% BTC MDR turns bearish to sell.

Take a look at the boxed portion below. Notice that the 5% MDR was bullish throughout. We need a secondary signal to adequately time the market which is where the 1% MDR comes in.

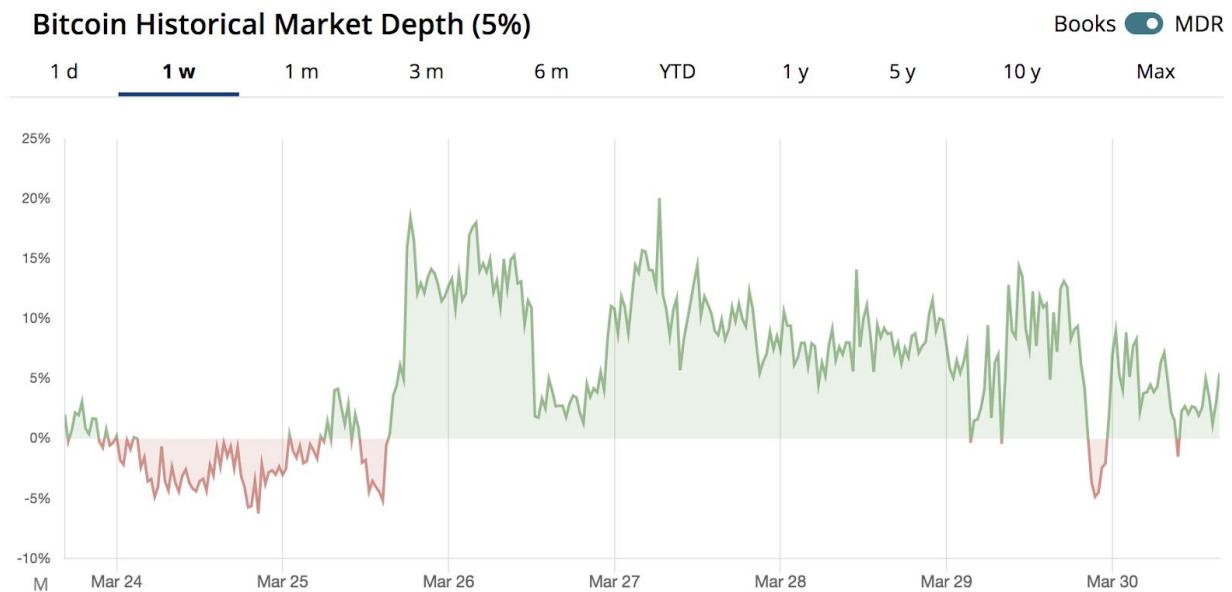


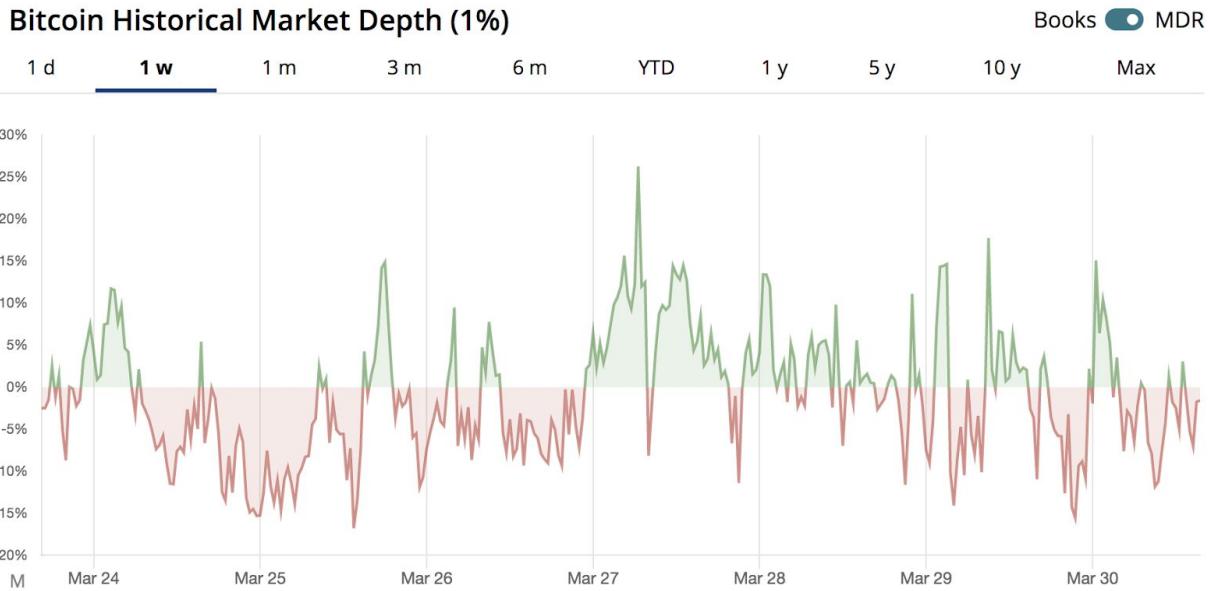


Now on the 1% range below. Notice that the only time that the 1% MDR turned bullish was at the market bottom. If you had just followed the 5%, you would have bought at a bad rate. However, by looking at the 1% MDR as well, you can time the market far better.

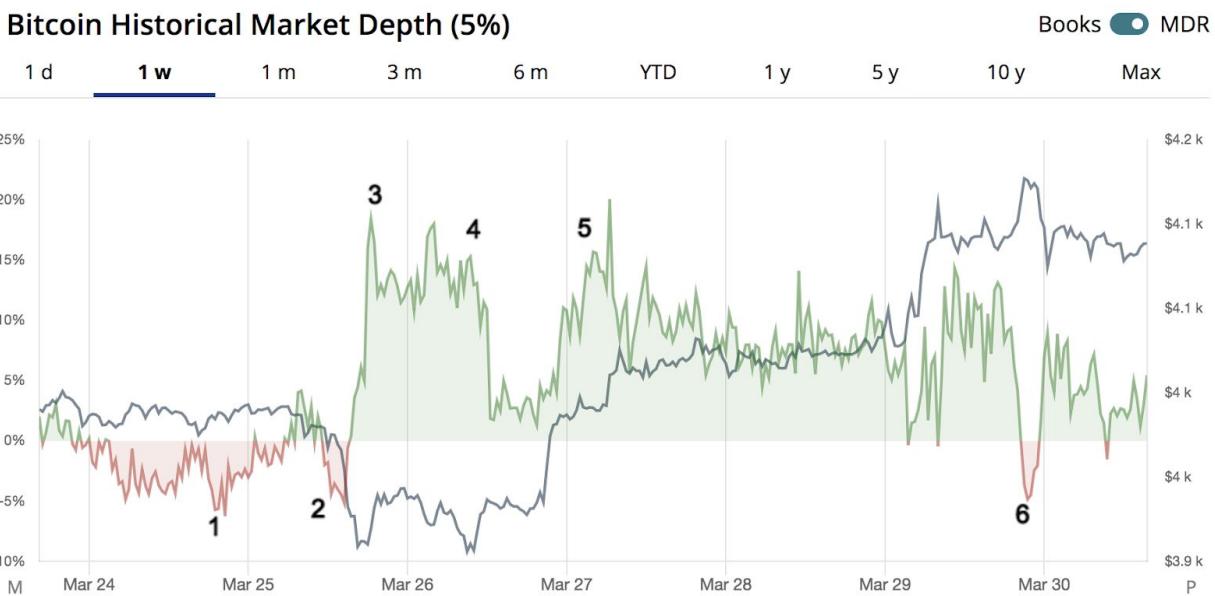


This is the 5% and 1% range MDR combined on BTC, lined up in sequence. If price was trading at \$4000, then the 1% order depth range would show bidding from \$3960 to \$4000 and offering from \$4000 to \$4040 and the 5% range would show bidding from \$3800 to \$4000 and offering from \$4000 to \$4200. We look at these two in conjunction because the 5% provides us with the medium-term LOB pressure and the 1% provides us with the short-term LOB pressure. When the 5% and 1% are both indicating the same bullishness/bearishness of price, there can be a higher probability that the market will move in that indicated direction.





Numbers 1-6 show where there was confluence between the 1% and 5% MDR BTC range. The 5% MDR chart below is the same as the 5% range MDR from two pictures before, but with numbers signifying various MDR values.



Points 1, 2, and 6 show where both the 1% and the 5% turned negative and price fell. Points 3, 4, and 5 show where the 1% and the 5% turned positive and price rose and continued its ascent. From point 3 to point 6, the 1% stayed mostly positive (only went



negative at short-term price tops) and the 5% stayed positive throughout — a good sign to stay in a long trade.

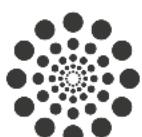
These three strategies can provide you with different setups to trade order depth successfully. They can also be combined in various ways for a more advanced strategy.

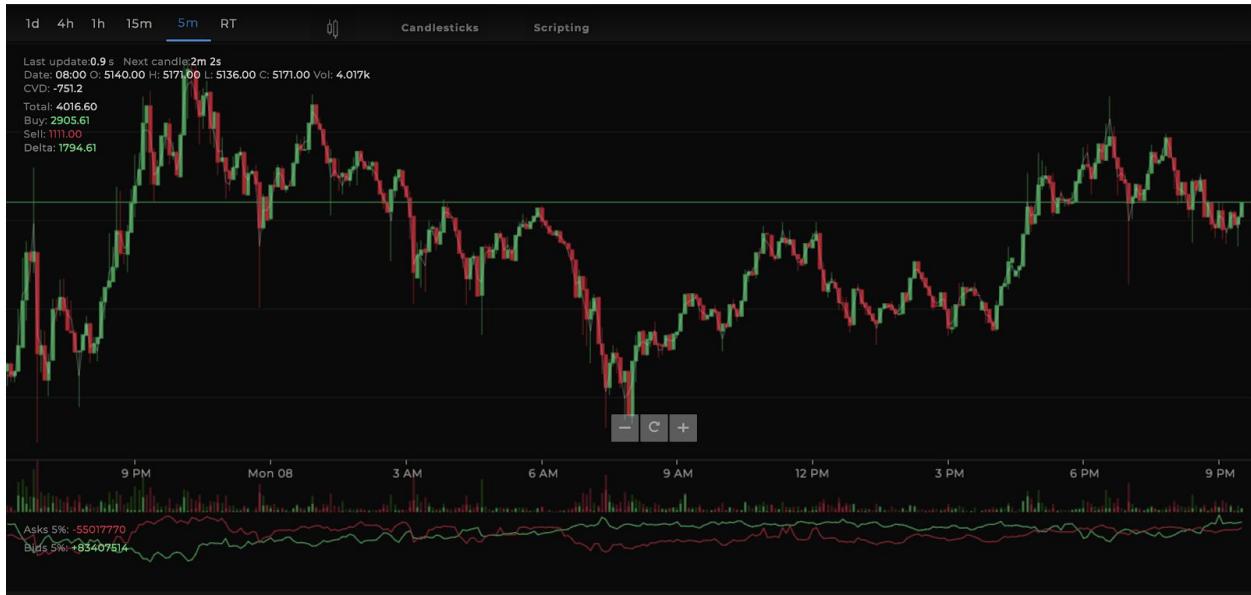
Advantage = You are gauging both medium-term (5% range) and short-term (1%) supply/demand. This mix allows you to time when best to enter/exit without having to rely on any other indicators to tell you exactly when to buy and exactly when to sell.

Disadvantage = You are only looking at spot BTC MDR and not at XBTUSD's order depth. Leaving out the order depth of Bitmex is missing out on an integral part of the actual total order depth.

4. Master of BTC Futures: Look at the futures order depth on its 5% and 1%. Use the 5% to gauge how bullish or bearish BTC is at the moment. If the 5% is bullish, wait until the 1% BTC also turns bullish to buy. If the 5% is bearish, wait until the 1% also turns bearish to sell.

The first chart below is the 5% BAS on XBTUSD. The second chart below is the 1% BAS XBTUSD. The numbered boxed portions on the 1% BAS show when the 1% and the 5% were in confluence — when the 1% crossed to match the same direction as the 5%. This confluence has consistently lead to very strong trades, as you are taking advantage of the intersection of short-term and medium-term order depth imbalances.





Points 1 and 4 show where both the 1% and the 5% turned negative and price fell on the excess supply. Points 2 and 3 show where the 1% and the 5% had turned positive and price rose in the short-term as a result of the heightened demand. What you can takeaway from this visual is that it may be best to enter a trade only when the 1% lines up with the 5% and potentially avoid entering the market when they are not in confluence.

Advantage = You are gauging both medium-term (5% range) and short-term (1%) supply/demand. This mix allows you to time when best to enter/exit without having



to rely on any other indicators to tell you exactly when to buy and exactly when to sell.

Disadvantage = You are only looking at Bitmex BAS and not at the market depth of other cryptocurrencies. Leaving out other exchanges may be missing out on an integral part of the actual total order depth of the cryptocurrency market.

You can use the strategies mentioned here within for entry or for exit. Although, some traders may prefer to use these methods for entry, whereas they may like to exit in a few different ways. Here are a few options you have when exiting an order-depth based trade:

1. Exit a long position on confluence from multiple bearish order depth indicators. This could occur when both the 5% and 1% BAS/MDR turn bearish or when both the 5% XBTUSD BAS turns bearish as well as the spot BTC MDR for example.

Exit a short position on confluence from multiple bullish order depth indicators. This could occur when both the 5% and 1% BAS/MDR turn bullish or when both the 5% XBTUSD BAS turns bullish as well as the spot BTC MDR for example.

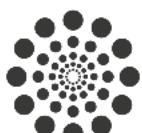
2. Exit a long position when your primary order depth indicator turns bearish and market aggression shows the sellers in control (market aggression is covered in the later chapters on order flow).

Exit a short position when your primary order depth indicator turns bullish and market aggression shows the buyers in control.

3. Exit a long position when price approaches a strong area of resistance. Locate this area of resistance by looking at the limit order book or at a heatmap.

Exit a short position when price approaches a strong area of support. Locate this area of support by looking at the limit order book or at a heatmap.

Also recall the chapter on supply/demand runs and how to fill your limit orders when entering/exiting a position. Remember that if you are in a long position and price is in a demand run, you can use an offer to exit by taking advantage of the present market



buying and lack of present offers. If you are in a short position and price is in a supply run, you can use a bid to exit by taking advantage of the present market selling and lack of present bids. However, if you find yourself holding a losing position, do not be afraid to cut your losses with a market order or allow your stop loss to be hit.

Do note that one drawback of trading order depth comes from spoofing, as order depth can be manipulated to show interested buyers/sellers in orders that are never set to transact. The chapter ahead will dive into methods that you can use to mitigate the effect that spoofing has and even grant you the ability to take advantage of spoofers. Thus, you can discern between genuine supply/demand and trade directly off it (order depth imbalances as mentioned in this chapter) and identify spoofed supply/demand and act accordingly.

Data Links

★ Bitmex XBTUSD BAS

https://data.bitcoinity.org/markets/bidask_sum/24h/USD/bitmex?bp=5&bu=c&r=minute&t=m

★ Alternate Bitcoin BAS

<https://bidasksum.com/>

★ MDR for all Coins

<https://vcdepth.io/>

★ XBTUSD BAS + Global MDR

<http://caracalboard.com/>

Chapter 5. Spoofing and Market Manipulation

5.1 Spoofing

Spoofing is the antithesis of order depth. In the United States, the practice of spoofing in regulated markets is illegal. Spoofing is defined by the CFTC as “bidding or offering with the intent to cancel the bid or offer before execution.” Essentially, spoofing is an act in which traders bluff the order book for the purpose of misleading other traders. Cryptocurrency markets are unregulated, meaning that spoofing can occur as often as



large, sophisticated traders would like it to. The reason why a trader would choose to spoof the order book is three-fold: short-term speculation, accumulation/distribution purposes, and stop loss hunting.

1. Short-term speculation: A high frequency trader (HFT) may place bids near the top of the order book to make it look as if price is about to rise higher. Other traders notice the influx of bids, so they too begin placing bids at or just above the price of the original spoof bid. After price rises in the short-term, the HFT can sell into all of the liquidity generated by the original spoof bid (meaning that the HFT market sells at other trader's bids). After selling, the HFT may then also spoof the market lower to buy at a better price. This cycle continues as the HFT profits off of these artificially generated deviations in price.
2. Accumulation/distribution: An HFT is interested in buying a large amount of Bitcoin (or any other coin). If the HFT were to set a large genuine bid order then the market would likely rise without the HFT's order getting filled due to the large order depth imbalance. Additionally, if the HFT were to market buy on the current offer side of the book, they would likely get their buy filled at less than optimal prices due to their massive trade size. Consequently, an HFT may choose to instead place a limit sell order near price in order to manipulate price lower. When they do this, they may place a series of limit buy orders that will fill as price moves lower. They may also market buy the generated liquidity after price moves lower as other traders placed their limit sell orders below the spoofer's original limit sell. In this method, the HFT is able to bully the market into giving both a better price and elevated liquidity so that the HFT can enter/exit profitably.
3. Stop loss hunting: This has facets of both short-term speculation and of accumulation/distribution. If an HFT is looking for liquidity at a better price than usual, they can look to press the market to reach a collection of stop losses. If the HFT notices that an altcoin is trading at 1020 satoshis for example, they can expect that many traders may have placed their stop losses just below the 1000 level. Consequently, with many potential sellers (longs who placed stop losses in that region), the HFT can spoof the order book and put on immense sell pressure to press price below 1000. Once price drops below 1000 satoshis, the spoofers are able to fill their bid orders and can use market orders to grab the available liquidity from any offers recently placed below 1000 as price rapidly falls as the stop losses



are hit. The benefit of this type of manipulation is that when stop losses are triggered, many market orders will execute which can allow large limit orders to fill at optimal prices for the HFT.

5.2 The 3 Stages

Most spoofing patterns fit into a 3-stage system that can be identified by a trader who knows what to look for and how to look for it:

1. The Build-up: A spoofor places limit order(s) to stack the market in one direction
2. Cancellation: The spoofor removes his fake order flow from the order book
3. The Sweep: The spoofor sweeps the generated liquidity with a market order

Master the identification of these three stages and you will be able to discern between genuine and spoof orders, avoid being spoofed, and be able to take full advantage of other traders getting spoofed.

Stage 1: The Build-up

A spoofor is interested in exiting a long position on an altcoin. He doesn't want to market sell and exit at the immediate bids near price as he will likely be selling at a lower price point. He wants to find a way to sell higher. He begins his spoof play by placing a large limit buy order at the top bid on the order book. When traders (and bots) notice a large deal of buying pressure such as a large bid being placed at the top bid, many may cancel their limit sell orders and place them at higher levels. In addition, when other buyers see a large bid placed at the top of the order book they may rush to market buy the liquidity available at the offers at the bottom of the order book and other buyers may place their bid orders just in front of the spoof bid. For example, imagine the spoof bid is at 932 satoshis. Another trader may place their bid at 933 and other traders may continue to place their bids ahead of one another fueling price.

The combination of sellers pulling their orders due to the large spoof bid, as well as other buyers rushing to buy in will likely propel price higher (as the spoofor intended). In this example, price is being manipulated higher on artificial bidding so that the spoofor can sell at a better price on heightened liquidity. Additionally, if this spoof play was



instead artificial offering (a spoofing placing a fake offer wall to push price lower so that he can soon buy) then the reverse of what happened in the above example would occur.

Stage 2: Cancellation

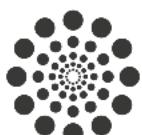
Now the spoofing pulls his order, which in this case was a large bid. However, the market has shifted higher and the majority of traders who had gotten accustomed to the period of high demand have likely kept their bid orders near price. The spoofing has succeeded in pressing price higher. Recent bidders getting spoofed will be attacked now for liquidity with ‘the sweep’.

Stage 3: The Sweep

The spoofing uses a large market sell order that absorbs the liquidity from many of the bidders. The price now moves back downward as the heavy selling exerts massive pressure on the market. The cryptocurrency has been successfully spoofed by the trader. He was able to prop the market up on fake demand, convince other traders to buy at elevated prices, and then sell at a higher price than what would have normally been available.

Here is an example of a spoof play that is made for liquidity: a trader is looking to buy another 5 BTC worth of an altcoin that he is holding. The order book is currently bouncing between a bid of 843 satoshis and 844 satoshis. If he were to market buy with 5 BTC, he would buy from the prices far above 844 due to the lack of order depth at the offer of 844. The bid volume at 843 is 1 BTC and the offer volume at 844 is only .1 BTC. The spoof trader places a large limit sell of 5 BTC at 845. Out of fear that price will be moving lower soon, other traders place their limit sell orders at the bottom offer of 844 after the limit sell is placed at 845. After a few minutes, the offer volume at 844 has grown from .1 BTC to 6 BTC and the spoof trader buys 5 BTC worth at 844. He then pulls his limit sell order at 845. By doing so, he has generated liquidity on the offer so that he was able to only buy at the best offered price.

Here is an example of a spoof play that is made for manipulation purposes (commonly called “momentum ignition” among traders): a trader is not looking to trade at the current moment, but rather is interested in manipulating the price higher to increase profits. The spoof trader places a large artificial bid order at the top bid of the order book.



Consequently, price moves higher as other bidders place their orders ahead of the large bid. The original spoof order was not placed to manufacture liquidity for the spoofor to sell to, but rather to drive the price as high as possible. This type of play is still spoofing and not genuine demand as the spoofor attempting to drive price higher would likely cancel their large bid if it was in danger of getting filled.

Now, let's take a look at what these spoofing plays look like from an order depth perspective as well as from an order flow perspective.

5.3 A Market Depth Visual

Here is a spoof play that can be observed on the 1% historical bid and offer book:



The three circles denote the three key points of the spoof play. The red movement from the first to the second circle shows the sharp rise in offers that occurs on the 1% order depth. When this occurs, notice that price falls (price is in gray, bids in green, offers in red). This is the build-up.

After price falls, the offer is pulled. Take a look at the offer volume before the offer is placed (the volume of offers at the first circle). Compare this to the offer volume within the third circle. The order depth volume of the offers on the third circle had about the same amount of volume as the first circle, this is a typical sign of a spoof play. You



will find that the bid/offer volume typically reverts back to normal after the spoof order is pulled. This is the cancellation.

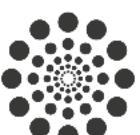
After the offer is pulled during the third circle, price easily moves higher. This is the sweep.

Here is another potential spoofing play on the same coin:



There was likely a spoof order placed as price is falling, and the spoofer's objective of manipulating the market lower is successful. The first circle on the left shows where that order is then pulled and price rises. After, a series of large offers appears on the order book. Price moves sideways from 9PM to 1AM before heading lower on the strong selling pressure. The spoofer pulls his offer within the second circle on the right. Price rises, albeit this time much higher as there were no more large offers placed.

Take a look at the order depth on STRAT below:

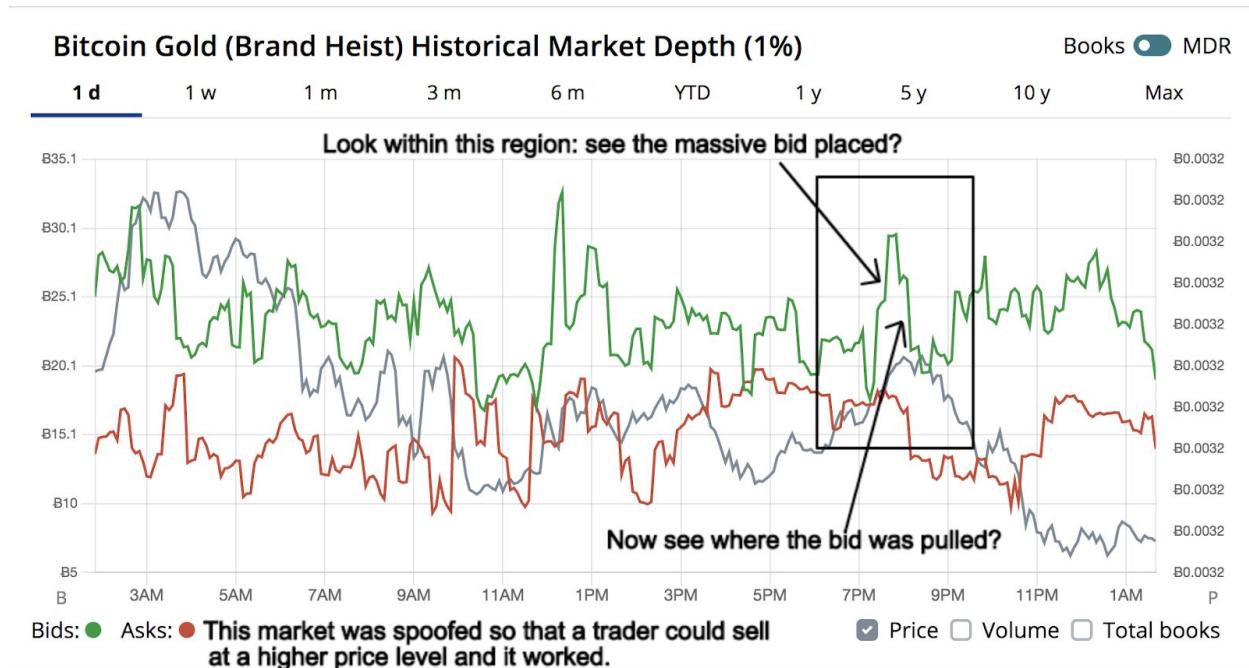




Within point 1, notice the three circles that show the pattern of a large bid being placed and price moving higher. The bid is then pulled and price falls shortly after. This same pattern occurs again within point 2. A large crypto trader or bot was likely able to manipulate the price of STRAT for short-term profits.



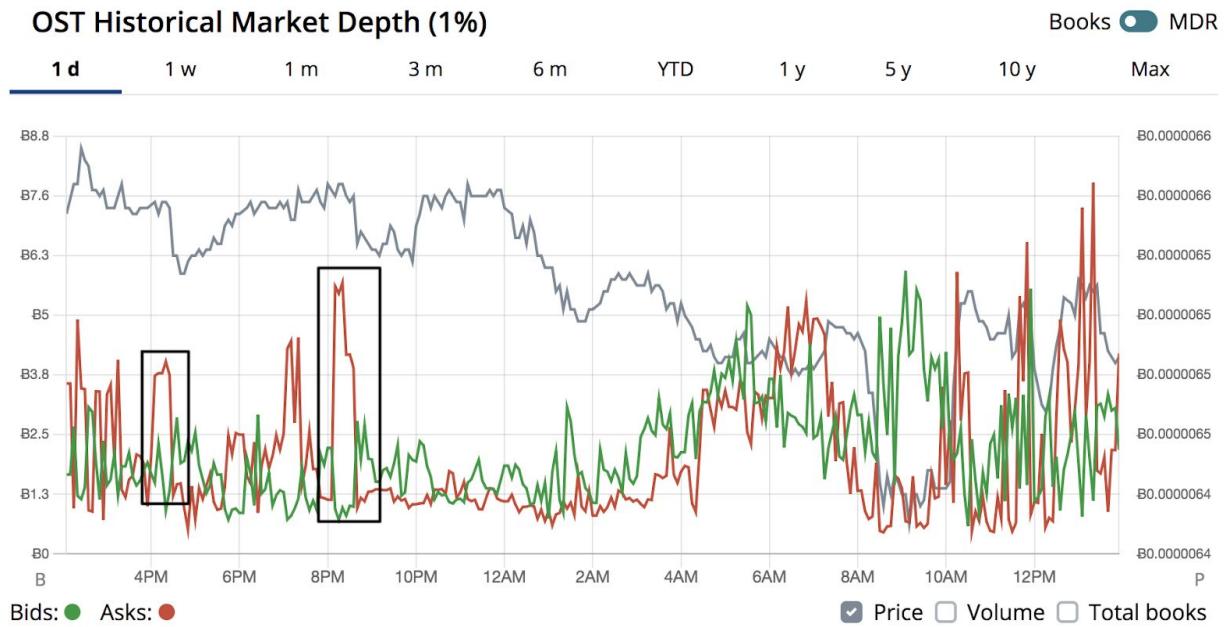
Take a look at BTG:



As you can see from this annotation above, a bid is placed and price rises. After price is able to rise an adequate amount, the bid is pulled and price begins a downtrend. This spoofing play is enacted so that the spoofee can sell at a higher price.

Hunting stop losses is another method that predatory traders can use. It is similar to spoofing, yet with a different goal. Whereas spoofing is meant to fool other traders to place limit orders and get price to trend in a certain direction, stop loss hunting in the order book is meant to get price to trigger many stop losses of traders so that predatory traders can buy/sell large positions at great rates. Remember that many retail traders tend to place stop losses just below lows and above highs as well as just beyond round price levels, such as a long's stop loss being placed at 999 satoshis when the market is trading above 1000 satoshis.





Take a look at the two indicated points of the offers above, specifically the points at which the orders were placed and then pulled. In both, price makes a sharp move lower below a low, triggers stop losses, and then moves back upward. Not surprisingly, the offer is pulled immediately after the stop loss hunt occurred. This allows predatory traders to take advantage of stop losses of retail traders, allowing them to profit off of the short-term speculation.

Notice the erratic order depth patterns on the far right side of the chart of OST. Those orders (both bids and offers alike) continue to be placed and then pulled. Even when the market moved in the direction that the spoofer intended, the orders were still placed. This pattern of order depth seems less like a specific stop loss hunt to a specific price zone, and more of spoofing for the purposes of price manipulation. It is important to also note that large order imbalances within lower percent ranges do not always imply spoofing. On large cap cryptocurrencies, a massive order imbalance near the current market price can reveal the genuine buying/selling interest of traders. Do remember that spoofing patterns are easier to enact on cryptocurrencies with smaller market caps. This is because a cryptocurrency with only \$5 million on its order book (\$5 million worth of that cryptocurrency held in bids and offers) can be spoofed by a trader who can use his \$2 million to push the price wherever he so chooses. If he would like to spoof the market lower, he can place a massive limit sell at the bottom of the order book and also market sell at the present bids. This will likely trigger panic and large-scale selling. After price



drops an adequate amount, he can then buy at the lowered price and spoof the market back upward for a profit. This pattern can be endlessly repeated so that the spoofing who holds a large market share of that cryptocurrency can profit off of the short-term speculation.

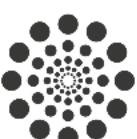
5.4 An Order Depth Visual

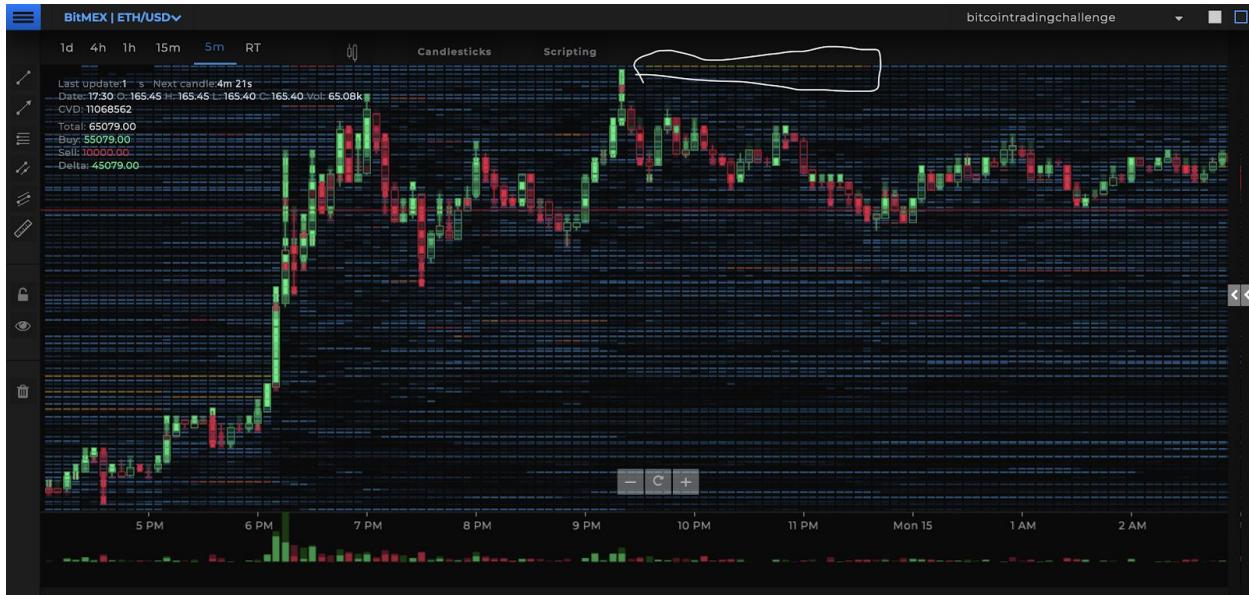
An advanced method to analyze potential spoofs is to look at a historical visual of order book levels. The chart below is from a website called Tensorcharts. Blue signifies small limit orders and yellow signifies massive limit orders.



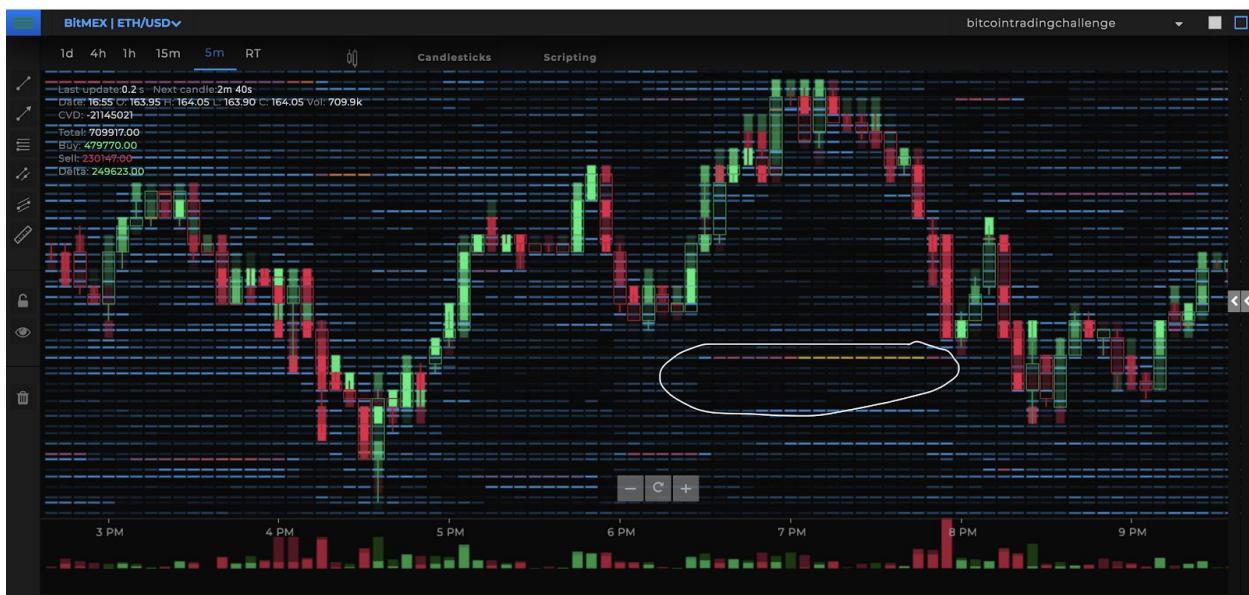
Take a look at the circled limit order above. This large limit sell order was placed as price was consolidating, perhaps with the simple goal to push price lower. The order was then pulled (edge of the white circle) and price rose. This could have been a spoof play.

To take advantage of this, you could think about buying once the large limit sell above price was pulled, especially because there was a large limit buy placed below price (as can be seen in yellow). That limit order was genuine; you can see it held and was not cancelled when price dipped down to touch it just before 5PM.





Now take a look at the circled portion above. That limit order was placed after price made a top, then the order was pulled after the market made a short-term bottom. After the order was pulled, price slightly rose.



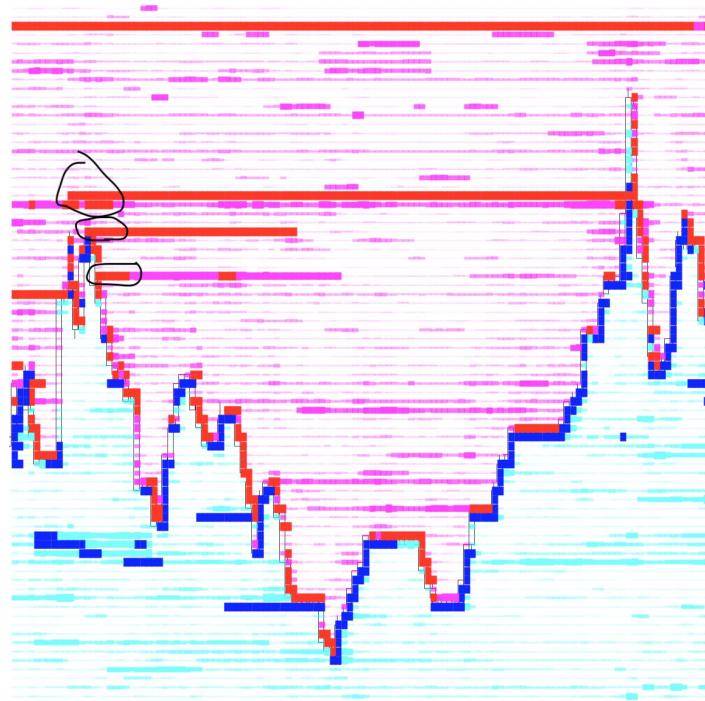
The chart above shows a pattern quite similar to other spoofing plays in this section. A large limit buy was placed and the bid increased in volume at around 7PM (as can be seen in its change in color). However, as price neared that level and looked as if it was going to break through it, the order was pulled. This was a partly unsuccessful spoof



as even with the large limit buy order, price still fell. The trader may have noticed that the market was likely to fill that level, and consequently pulled their limit buy.

You can use Tensorcharts for medium-term trading and order flow data. For more advanced order flow and a shorter-term view, you can use the website ATAS. Dark blue levels are large bids and dark red levels are large offers. The candles are 30-second transparent candles, but you can still track how price moved by following the price outline. When a transparent candlestick was blue, that means that a large bid was the best bid (highest bid in the order book) and that it carried price upward. When a transparent candlestick was red, that means that a large offer was the best offer (lowest offer in the order book) and that it carried price downward.

Take a look at the three black circles. The top circle was a genuine sell order (it was filled) and the bottom two black circles were likely spoof plays. The middle black circle (2nd down from top black circle) was placed and then price fell. This order was then pulled after the market bottomed out (notice how when the red vanished, the offer vanished). The third circle shows an offer that was placed and after price fell, some of the present volume in that offer was pulled. The offer was then totally pulled after price began to rise after making its bottom (notice that the offer goes from red to purple and then vanishes altogether).



If you want to look for short-term spoof plays, then advanced order flow sites such as Tensorcharts, Bookmap, and ATAS may be best. More on the heatmap will be detailed in the latter part of this guide.

5.5 Mind the Spoof

You have three options when it comes to approaching market spoofs: ignore them, avoid them, or trade them.

If you choose to *ignore* any potential spoofing plays as revealed by order depth or order flow, I would highly recommend using an additional indicator alongside order depth. If you look at order depth on the XBTUSD BAS and on the global combined MDR, then you may want to also use other non order depth related indicators, such as locating market aggression (detailed in the order flow chapter later in this guide).

If you choose to *avoid* any potential spoofing plays, then you may want to look back historically at both the order depth and order flow patterns of the coin of your choice. If you see time and time again that the coin you are looking at has had less than honest order depth, then you may want to avoid trading that coin altogether and instead look to trade a different coin. Additionally, remember that it is easier for spoofing to occur on smaller market cap altcoins than it is for it to occur on massive market cap cryptocurrencies.

If you choose to *trade* potential spoofing plays, then you can do the direct opposite of what was advised in the above section. Instead, look for coins that have been spoofed in the past and have had similar price reactions each time. This will allow you to be ready to spot and trade these potential spoof plays.

Data Links

- ★ Free Bitcoin Bid Ask Sum (BAS) *Only a handful of timeframes and depth ranges available*

https://data.bitcoinity.org/markets/bidask_sum/24h/USD/bitmex?bp=5&bu=c&r=minute&t=m

- ★ Global Combined MDR & Coin MDR

<https://vcdepth.io/>



- ★ Paid/Free Bitcoin Bid Ask Sum (BAS) *Allows for any depth range to be selected across multiple coins (paid service). Shows heatmap (free)*
<https://tensorcharts.com/>
-

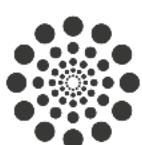
Chapter 6. Support/Resistance from the Order Book

6.1 LOB Levels for Order Placement

A very popular use of the limit order book is not for order depth, but for locating large resting limit orders and taking advantage of their placement. If you are able to locate where large orders have been placed, you can use this information to place stop losses and subsequent limit orders of your own.

Large limit orders tend to act as a barrier to price. Naturally, we can use this barrier to our advantage with the protection of our stop losses. If you enter into a long position and need to find a price to place your stop loss, then you can look within the order book for a large bid order.

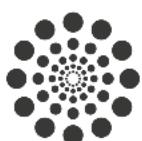
Look at ZILBTC's order book below, imagine you went long at 454 satoshis. There is a large bid present at 451 satoshis and another medium-sized bid at 450 satoshis.



Price(BTC)	Amount(ZIL)	Total(BTC)
0.00000461	47,310	0.21809910
0.00000460	37,049	0.17042540
0.00000459	147,238	0.67582242
0.00000458	145,752	0.66754416
0.00000457	227,239	1.03848223
0.00000456	95,435	0.43518360
0.00000455	213,571	0.97174805
0.00000455 \$0.022563		█
0.00000454	5,700	0.02587800
0.00000453	212,023	0.96046419
0.00000452	220,166	0.99515032
0.00000451	2,436,066	10.98665766
0.00000450	735,865	3.31139250
0.00000449	306,232	1.37498168
0.00000448	57,656	0.25829888

We can use the large bid wall to our advantage by placing our stop loss at 450 satoshis or at 449 satoshis. We can place this with confidence as it would take around a 13 BTC worth of ZIL sell off for price to move down to 450 satoshis (this figure of 13 BTC came from the bid volume at the levels of 454, 453, 452, and 451 added together). Alternatively, instead of placing a stop loss just beyond a major order book level, we can place a limit buy order just in front of a major order book level. We do this as we can expect that the market will not find it easy to breach a major order book wall. Consequently, we place our orders in front of these walls so that we get filled first.

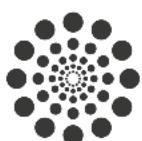
In the example above, placing a bid on ZILBTC at 452 satoshis is strategic because in the event of a large market sell, our order will get filled first. Additionally, if the market trades down to the large wall at 451 satoshis, we can ensure that we get filled as that move occurs. As you may have been able to glean from ZILBTC's order book in the first picture, there was a large amount of demand near the current market price. As a result, price rose to the new best bid at 459 and best offer at 460.



Price(BTC)	Amount(ZIL)	Total(BTC)
0.00000466	409,290	1.90729140
0.00000465	346,308	1.61033220
0.00000464	164,419	0.76290416
0.00000463	129,936	0.60160368
0.00000462	46,150	0.21321300
0.00000461	94,728	0.43669608
0.00000460	214,259	0.98559140
0.00000460	\$0.022905	
0.00000459	26,209	0.12029931
0.00000458	326,760	1.49656080
0.00000457	450,825	2.06027025
0.00000456	390,302	1.77977712
0.00000455	348,014	1.58346370
0.00000454	319,542	1.45072068
0.00000453	233,542	1.05794526

The benefit of taking a visual look at limit order placement is that you are able to see historical order placement and how price responded to that level. You can see where limit orders are placed, pulled, or executed upon (when a series of market orders fills the liquidity of an order wall).

In the chart below from Tensorcharts, massive order walls on Bitmex are highlighted in yellow and medium-sized order walls in orange. There are two major order walls in yellow, one below price and the other above price. We know that price will likely have a tough time cruising past these points.





Price moves upward, is rejected by the top offer level, (in yellow, white box captures price hitting this level) and rapidly retraces back lower. If you had set your limit sell order just below the major level, you would have been filled at a great price. If you had placed your stop loss just above this large offer level, you would have been protected from your stop loss being triggered.



Another option for trading off of LOB levels is to take a look at the *live order book* overlayed onto a chart. The example below shows the advanced order flow tool, ATAS, that will be covered frequently in later chapters.





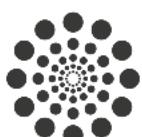
The green lines show live bid levels and the red lines show live offer levels. Each “X” mark indicates a potentially strong support/resistance level. You can utilize these large limit levels by placing your orders just in front of a large bid or offer, or by placing a stop loss just beyond a large order book level. **However, always make sure that the large bid or large offer that you had located still exists in the order book because if that large order is pulled, you may want to move your own orders into a different price area.**

Finally, put these large limit orders into price action context:

Do you see many bids or a large bid at a previous support level? If yes, that level may be a price bounce area and you can potentially buy around that support zone.

Do you see many offers or a large offer at a previous resistance level? If yes, that level may be a price bounce area and you can potentially sell around that resistance zone.

Do you see a large bid placed on the best bid with that bid remaining at the best bid even as price moves upward? If yes, price is likely within a period of strong demand and will most likely continue to rise until that bid is cancelled or filled.



Do you see a large offer placed on the best offer with that offer remaining at the best offer even as price moves downward? If yes, price is likely within a period of strong supply and will most likely continue to fall until that offer is cancelled or filled.

Do you see a large bid or offer that is constantly being cancelled and replaced? If yes, this order could be a spoof/non-genuine limit order and price might not respect that price level. When price reaches the area where that bid/offer was cancelled, the bid/offer activity might be all together cancelled or simply placed farther away from price. Thus, check historical order book or the DOM (covered in a later chapter) levels to find which limit orders have rested for some time on the limit order book non-cancelled and which limit orders are constantly being shifted around.

6.2 Executed LOB Levels as Trend Strength

There is another way that we can interpret large limit order walls. When a large limit order wall is completely filled by market orders transacting on that level and price continues to move in that direction, that is a sign of trend strength. For example, if there are many large limit order walls below price and price suddenly is able to move past that level on heavy market selling, this could be a sign of a strong bearish price move that is developing. The reasoning behind this is that it shows a supreme amount of selling interest in the market, which could lead to further selling at lower prices.

Below is an example on ETHUSD, with limit order walls of contracts over 1000000 shown in yellow. Notice the massive limit orders above price. If these walls were filled, price would have an easier time moving higher.





Price fills the order walls and continues moving higher in the uptrend. After executing upon the first order wall indicated in the white box, price moves about 6% higher.



When interpreting large order book walls, a distinguishing factor between an order wall that stands strong (price moves in the opposite direction) and an order wall that falls can be best uncovered by looking at the amount of pressure that is placed on that order wall. If price spends a lot of time near an order wall, this shows an inability of that order wall to exact pressure upon price and price may soon surpass that level.

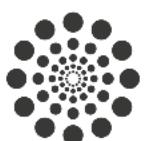


Look at the 5m chart of Bitcoin below. Order walls of over 2000000 contracts are highlighted in yellow. Take a look at the price zone indicated by the white box. Is this order book wall being respected or is price likely to fill this wall and continue to move higher?



Price fills the wall within the white circle drawn (offers) and price moves higher in a similar pattern to what happened to ETHUSD on the previous page. Why does this occur?

Take a look at the amount of pressure that had mounted upon the order book wall. Also notice the boxed portion below of the multiple levels of large bids. Price did not get anywhere close to executing upon those limit orders as these bids were respected by price.





As you analyze large limit orders, focus on the levels that are respected and the levels that have been or are currently being executed upon. When price moves away from a large limit order or a series of large limit orders, this shows strength behind the limit order. When price repeatedly bounces against a large limit order, that shows the weakness of that limit order and price will likely eventually move beyond that large limit order. Therefore, to track the willingness of the market buyers/market sellers to attack a limit order wall, take a look at the market's aggression (covered later in the chapter on order flow).

6.3 Ease of Movement

Instead of using a cluster or a single large limit order(s) for a better view of support/resistance, we can look for price areas in which there are not many limit orders. In a scenario where there are many limit orders above the current market price and not many limit orders below the current market price, price can begin trending lower as the lack of bid orders could lead to a rapid price drop.





Take a look at the two circled portions above. The top elongated circle shows a portion of the heatmap in which there were not many limit orders (dark areas in the heatmap above show a lack of depth in limit orders, yellow shows a price level of large order depth, and bright blue shows a price level of middling order depth). At the same point in time that this vacancy was active, there were many limit orders that were below price (bright blue). Price moved upward and rapidly burst through this weak area of resistance due to the lack of offers that would stop price's ascent.

The second smaller white circle shows another price area where there were not many bids. Price easily moves lower through that area of weak order depth.

When looking at a historical order book, historical DOM, or a heatmap, pay attention to not only where large limit orders are located, but also to where there seems to be a vacancy of limit orders on the limit order book. It will take less market buying in order to break through a price area where not many offers are located than it would for a price area where many offers are located. Likewise, it will take less market selling in order to break through a price area where not many bids are located than it would for a price area where many bids are located.

Additionally, you can use an “ease of movement” analysis to check whether a support/resistance level is likely to hold. If there is a vacancy of limit orders at a potential



support/resistance level, that level will likely not hold price on another test of that price area.



Take a look at the indicated portion in white. Previously (to the left of the white portion), price had established support at this level. After price moved back higher, there were very few bids that were placed at this area of support. This is a weak level of support.



As a result, price easily falls lower as there were not many bids that were placed that would have halted price's aggressive descent. An ease of movement analysis will not always reveal where price will trend in the future. However, it can reveal which price zones will act as support/resistance and which price zones will fail to hold price back. Therefore, it is crucial that you use other indicators/analyses in conjunction with an analysis of the strength/weakness of the limit order book.

In Sun Tzu's *The Art of War*, he states that it is best to avoid what is strong and it best to attack what is weak. Using your knowledge of LOB levels, you can identify the prices at which a coin may encounter strong support/resistance and the prices at which a coin may encounter weak support/resistance. Thus, you can use this knowledge to position yourself on the side of the strong (respected large limit orders = strong, many large limit orders being filled by market orders = strong sign of trend continuation) to attack what is weak (price areas of weak order depth).

Data Links

- ★ ZIL Order Book *Other charts/figures in this chapter use ATAS and Tensorcharts*
https://www.binance.com/en/trade/pro/ZIL_BTC
-

Chapter 7. Application of LOB Strategy

7.1 Consolidation and Trends

The order book patterns that occur within consolidation can vary greatly from the order book patterns that occur during trends. During consolidation, the buyers and the sellers are gridlocked in a battle with neither side gaining significant ground. During this battle, you can use order depth to determine which side is likely to win and create a new trend.

You can use the strategies highlighted within this guide in conjunction with one another or just one strategy by itself. You can also incorporate the methods discussed into another strategy that is not covered in this guide to build a hybrid method. However, you must first be able to recognize the state that the market is in (uptrend, downtrend,



consolidation). Only then can you attempt to piece that together with order depth patterns.

If you are able to check the way in which price is trending, or if price is consolidating, you can then apply your order flow/order depth knowledge to the current state of the market. Deciding whether the market is in a state of consolidation or trending can be quite subjective, but it mostly depends on the timeframe that you look at. To make it more formulaic you can use these models:

If you are a scalper and typically use the 1-minute or 5-minute timeframe, first determine the state of the market on that timeframe (look back at the price action of at least the last 300 candles). Then, look at a higher timeframe, such as the 30-minute or the 1-hour to see the longer-term market state (look back at the price action of at least the last 100 candles). It is not uncommon to find that price is consolidating on the 1-minute timeframe, but uptrending on the 1-hour, or that price is in a downtrend on the 1-minute timeframe, but consolidating on the 1-hour.

If you are a swing trader and typically use the 30-minute or 1-hour timeframe, first determine the state of the market on that timeframe (look back at the price action of at least the last 150 candles). Then, look at a higher timeframe such as the 4-hour or the 1-day (look back at the price action of at least the last 50 candles) to see the longer-term market state. When deciding to execute a trade, it may be best to also look at the 1-minute or 5-minute timeframe to grasp the supply/demand runs that could be occurring as well (look back at the price action of at least the last 200 candles).

If you are a position trader and typically use the 4-hour or 1-day timeframe, first determine the state of the market on that timeframe (look back at the price action of at least the last 100 candles). Then, look at a lower timeframe such as the 30-minute or the 1-hour (look back at the price action of at least the last 200 candles) to see the more medium-term market state. When deciding to execute a trade, it may be best to also look at the 1-minute or 5-minute timeframe to grasp the supply/demand runs that may be occurring as well (look back at the price action of at least the last 200 candles).

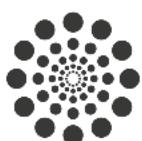


The price action lookback is up to you. The numbers for the lookbacks of the candlesticks mentioned above are just a reference point you can use. Additionally, it also may help to maintain a heavier focus on the more recent price action in order to properly diagnose the market state.

Here is an example of what a scalper trader may look at:



The boxed portion above shows the current market state of consolidation on XBTUSD on the 5-minute timeframe.



The boxed portion above shows the current market state of an uptrend on XBTUSD on the 1-hour timeframe.

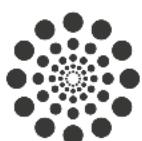
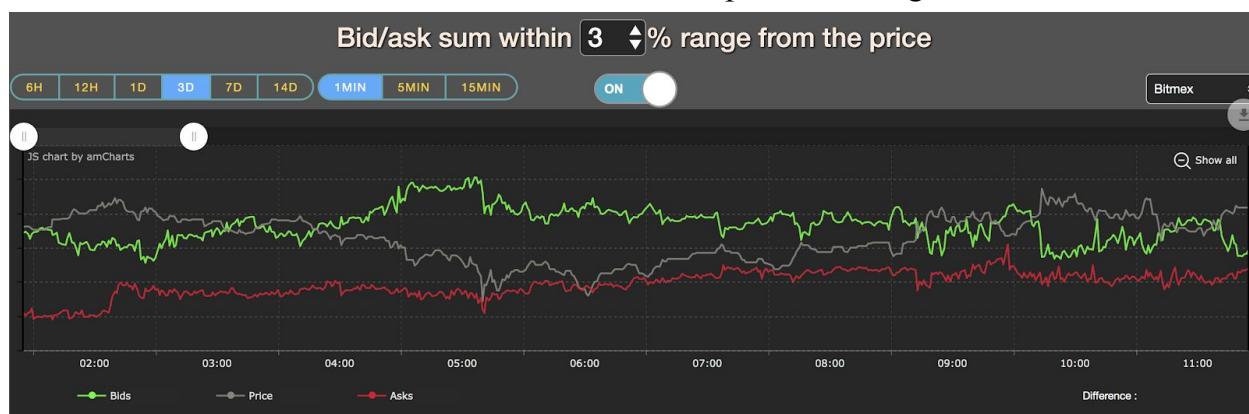
From this quick analysis on Bitcoin, we have gathered that in the short-term, price is consolidating and, in the medium-term, price is uptrending. As a result, short-term order depth (looking at the 1% BAS or MDR) may give us a clue to whether the buyers or the sellers will win out. Looking at medium-term order depth (think 5% BAS or MDR) may give us a clue as to the likelihood that the current uptrend halts or continues.

Furthermore, you can practice your skill of diagnosing the market as consolidating, uptrending, or downtrending by scrolling back to historical price action and labeling each phase up to the present. Do this on multiple timeframes and keep an eye out for how price transitions from one market state to the next.

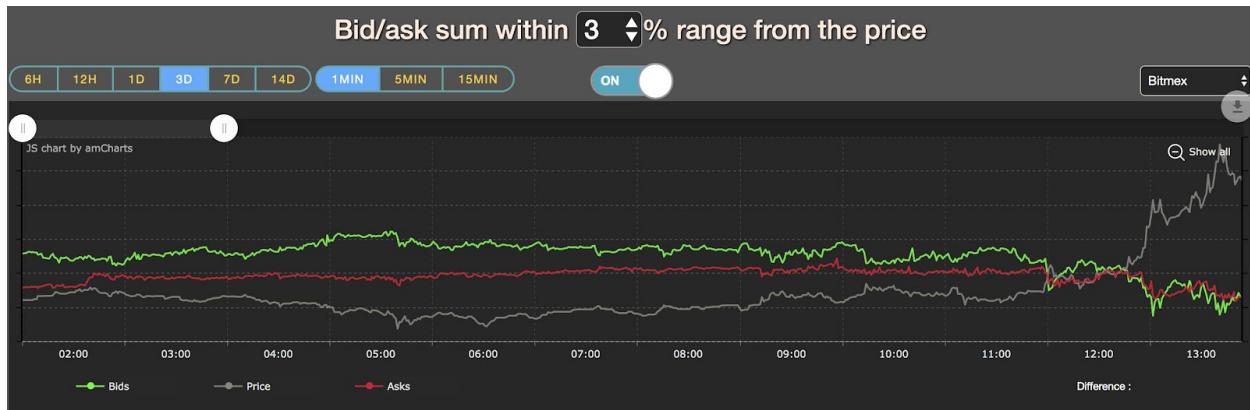
7.2 Trading the Consolidation Phase

Order depth traders may find that trading consolidation market patterns can lead to higher probability trades rather than interpreting the order depth during a trend. Consolidation price patterns have an overall flat price move where no dominant trend is present. It is within these patterns that accumulation/distribution occurs. When traders are attempting to accumulate/distribute positions, there typically is a limit order imbalance present, with either more traders attempting to buy or more traders attempting to sell.

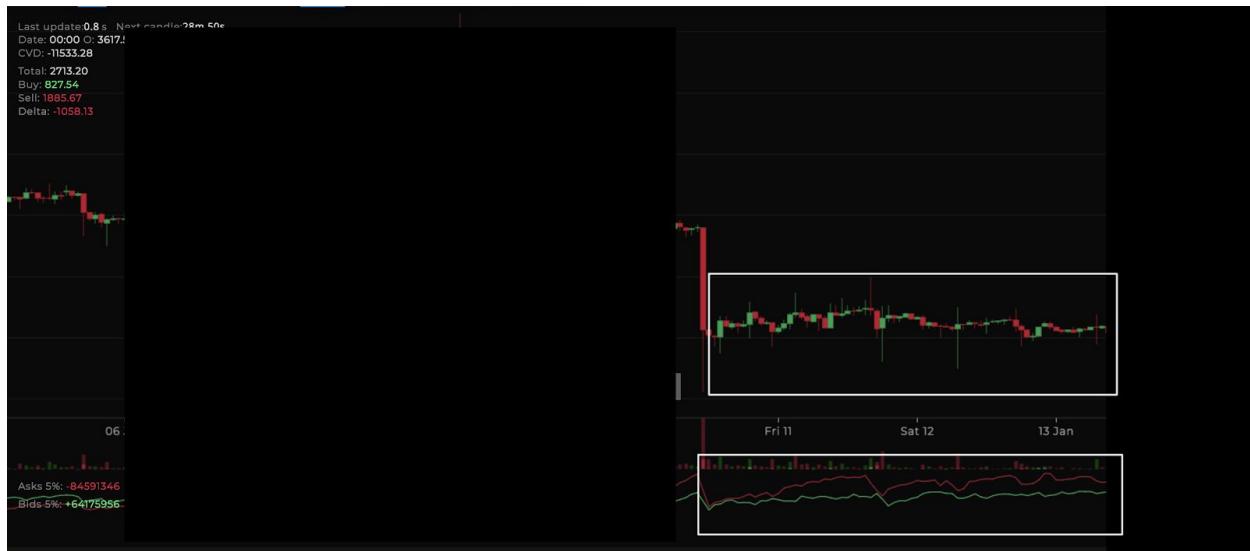
Take a look below at the 3% XBTUSD BAS from Bidasksum.com. As per usual, price is in gray, bids are in green, and offers are in red. Price is currently consolidating from a low of 4972 to a high of 5028 over a 10 hour time period. There is a clear dominance of bids over offers, with excess demand present throughout the consolidation.



Price rallies to a high of 5240 as the strong present demand pushes price higher. This is a typical type of order depth pattern that can be found in consolidation patterns. There is a large amount of excess demand and price begins an uptrend or there is a large amount of excess supply and price begins a downtrend.



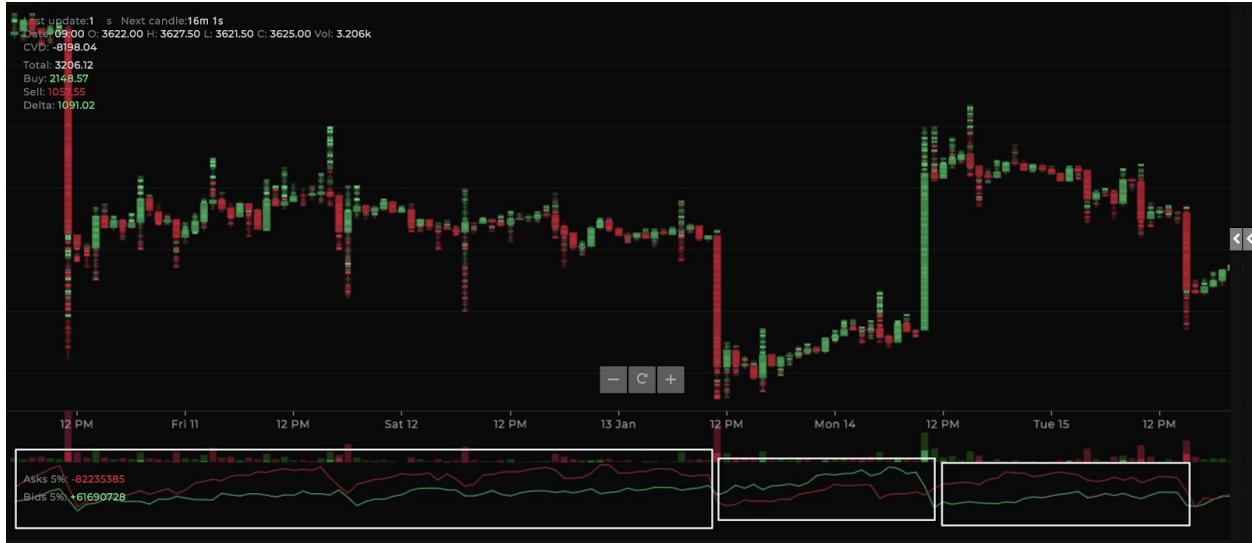
Take a look at the chart below at a higher timeframe consolidation structure. The top white box shows price consolidating and the bottom white box shows the order depth that accompanies it. This is the 5% Bitmex BAS on XBTUSD.



A beautiful pattern and result below: after the period of consolidation with prolonged excess supply (more offer depth volume than bid depth volume), price fell. Additionally, take a look at the other three white boxes below. In the middle white box ,



you can see price moving on relatively low volatility. On this low volatility, there was excess demand as the bids were greater than the offers and price rose. After the strong price rise, we see another low volatility pattern with excess supply and price subsequently falls.

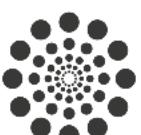


It is these patterns of low volatility and consolidation that can reveal the supply/demand nature of the market. Awaiting a low volatility/consolidation pattern on a cryptocurrency and pairing that market state with order depth metrics can lead to high probability trade setups.

You have a few options for entry within these patterns of consolidation and/or low volatility:

If order depth is bullish and you are looking to buy:

1. You can look to buy around the current support level of consolidation. For more confluence with this strategy, you can check the live order book to see where large limit buy orders may be resting.
2. You can look to buy below the current low of consolidation if you believe that a move below consolidation is likely a stop loss hunt and is not genuine supply that would lead to a downtrend.
3. You can look to layer limit orders within consolidation. This can be done by setting multiple bids within the lower half of consolidation. For example, let's say



that the BTC price is consolidating between 4900 and 5000, you can set these orders from 4900 to 4950.

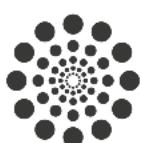
If order depth is bearish and you are looking to sell:

1. You can look to sell around the current resistance level of consolidation. For more confluence with this strategy, you can check the live order book to see where large limit sell orders may be resting.
2. You can look to sell above the current high of consolidation if you believe that a move above consolidation is likely a stop loss hunt and is not a period of genuine demand that would lead to an uptrend.
3. You can look to layer limit orders within consolidation. This can be done by setting multiple offers within the upper half of consolidation. For example, let's say that the BTC price is consolidating between 4900 and 5000, you can set these orders 4950 to 5000.

7.3 Trading the Trend Phase

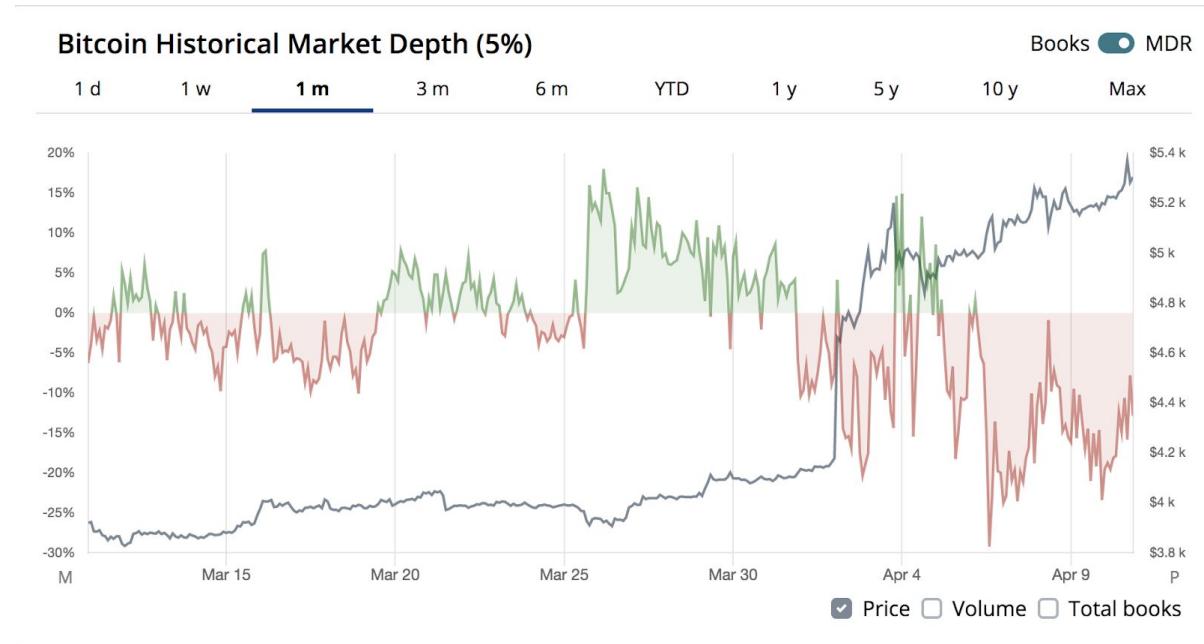
Using order depth for trending markets may be tougher than using an order depth strategy in consolidation/low volatility markets. One reason behind this is that you may notice a large change in order depth due to the market moving within range of large limit order walls.

Here is an example: you are looking at the 5% order depth on Bitcoin and price is currently at \$5000. You see a bullish order imbalance with excess demand and price rising on heavy market buying up to \$5250. After this price rise, the order depth turns bearish as the market has moved within range of large offer walls that are located in the \$5250 to \$5500 price range. Because price rose and moved into this range, order depth may look bearish when in reality the local order depth has not changed. To mitigate this issue, try to also incorporate shorter-term order depth ranges such as the 1% or 2.5%. You can check to see how close the order depth is to the current market price, and whether the order depth changed because price moved within range or if a new large limit order(s) was placed.

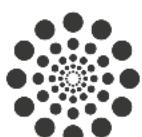


Another factor to look out for with order depth is that during a trend, you may notice that “market aggression” may overtake multiple large limit orders during the course of the trend. Market aggression refers to the extent to which the buyers market buy and the extent to which the sellers market sell. During an uptrend, you may notice bearish order depth but bullish aggression which can lead to a continuation of the uptrend. If you want to trade order depth successfully during a strong trending phase, it may be best to also look at data that reveals the aggression of the current trend or to only take an order depth trade when the market is trending and all order depth indicators are in confluence, and even then it may be better to wait for price to enter a phase of consolidation or lowered volatility in the timeframe of your choice.

During a strong trend, there are situations in which price will be moving against the MDR. Take a look below.



Notice in the example above that as price moved higher, the 5% MDR remained bearish. However, it would not have been the best time to exit a long trade, and it certainly would not have been a good time to enter short. One way to mitigate this issue would be to look at lower order depth percentages, analyze different sources of order depth for confluence, or identify the aggression of the market using indicators that will be covered in the advanced order flow chapter.

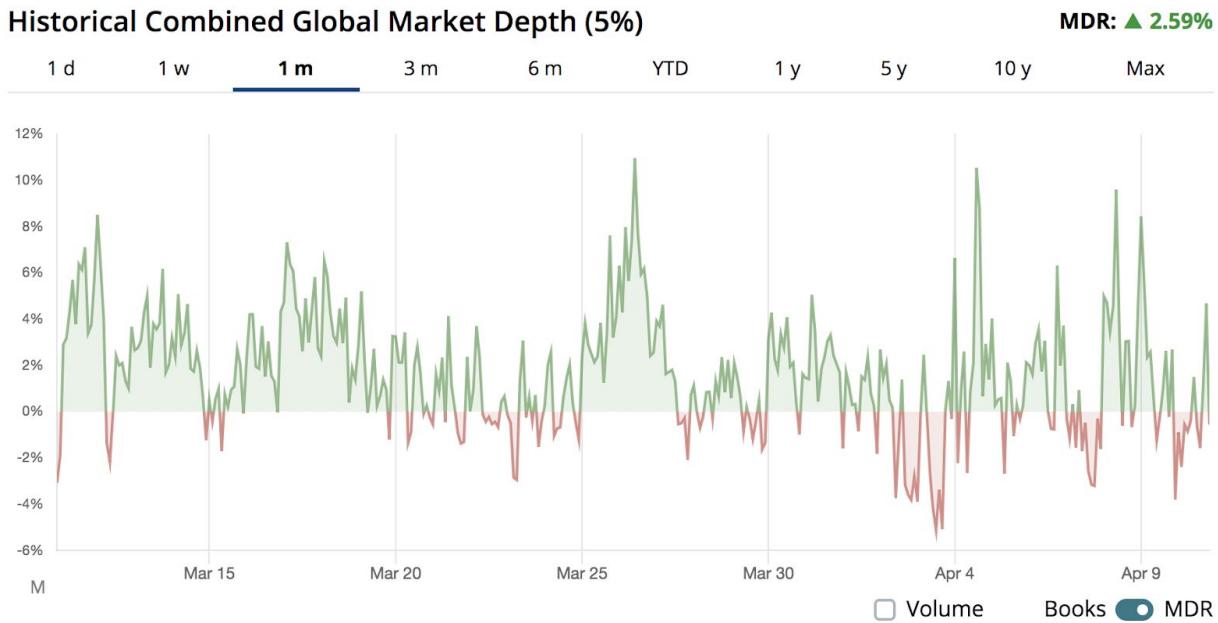




Above is an example of what the Bitmex BAS on the 5% looked like at the exact same time as the 5% Bitcoin MDR from the picture on the page before this one. The BAS remained bullish throughout. A smart order depth trader could have held their long position; as when you have successfully established a position and price is trending in your direction, it may be best to only exit when multiple order depth indicators are in confluence against your position.

However, before the uptrend shown above even began, both the 5% BTC MDR and the Bitmex 5% BAS were bullish (during the March price consolidation). This is a strong sign that it may have been best to take a position long during that time. Again, order depth patterns within price consolidation can be more clear and you may see a higher success rate with consolidating market patterns than when a strong trend is consistently breaking through large order walls (to which you may want to place an emphasis more on order flow instead of order depth).





Additionally, notice that within the same time window of 1 month of the BTC MDR chart and the BAS chart, the global MDR was mostly bullish.

If you had looked at the three order depth indicators of the BTC 5% MDR, 5% BAS, and the 5% Global MDR, you would have noticed that two of these three indicators were bullish. However, if you had looked only at the BTC MDR during the strong bull run, that lack of confluence could have left you in a poor trade. It is a necessity to look at multiple order depth indicators to avoid finding yourself on the wrong side the trend.

Additionally, when trading a trend, do not pay attention to only order depth, but also take a look at market aggression. When price is in an uptrend and a large offer is placed, but price is able to clear the offer and move higher, remember that this typically shows that the buyers are dominant. When price is in a downtrend and a large bid is placed, but price is able to clear the bid and move lower, this typically shows that the sellers are dominant.





Take a look at the three white circles above that each indicate where a large offer was filled. In the bottom circle, price is already in an uptrend and clears this level, indicating buyer aggression. The second large offer is filled in the middle white circle where price fills the level and then stalls. After this brief stall, price continues higher and finally fills the last large limit sell order, as indicated by the top white circle.

If you are able to track order depth/limit order placement and can track the eagerness of the market orders from the buyers and sellers, then you can analyze both phases of the market: limit order activity and markets order activity. This combination can give you a strong gauge for the present supply/demand of a cryptocurrency.

7.4 Two Methods of Trading

There are two types of traders who vary in their process of execution: “position-based traders” and “order-based traders.” A position-based trader looks to enter a position when the market is favorable in his/her direction, entering at prices directly at or near the current market price. An order-based trader looks for high probability reversal price areas to set their limit orders at and high probability continuation price areas to set their stop orders at. Both of these types of traders can use order depth and order flow analysis to best execute their orders.

Here is the process of a position-based trader:

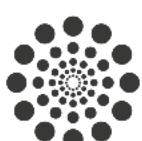


1. Analyzes whether the market is bullish or bearish in their preset time frame.
2. Shorter-term analysis of recent supply/demand runs to determine how the market has been responding to the best bid and best offer.
3. Has an idea of where to set a stop loss and take profit (or profit target).
4. Evaluates position size and total capital risk taken during the trade.
5. Looks to enter on a supply/demand run using limit orders or uses a market order to enter (only if absolutely necessary).

Here is the process of an order-based trader:

1. Analyzes price areas that are likely to turn very bullish or bearish. This can be for either continuation or for reversal.
 - a. For example, there may be an area above price in which you believe that if price reaches that area, it will continue higher, thus you can place a buy stop order there.
 - b. Another example is that there may be an area above price in which you believe that price will likely reverse down from, thus you can place a limit sell order there.
2. Has an idea of exactly where to best set limit entry order(s) or stop entry order(s) (recall that stop orders are conditional market orders that are only enacted when price reaches a preset level).
3. Has an idea of where to set a future stop loss and take profit (or profit target).
4. Evaluates position size and total capital risk taken during the trade.
5. Limit or stop order eventually fills or trader moves/cancels the entry orders in accordance with the coin's change in price and/or an indicator's change in value.

Both of these traders can use similar methods of analysis to execute their trades. A position-based trader can look at order depth and enter a position. Likewise, an order-based trader can look at order depth and then set orders at what they believe are likely reversal levels. A position-based trader can look at a large order or a series of large orders in the limit order book and subsequently enter a position based on that data. An order-based trader can look at a large order or a series of large orders in the limit order book, and then strategically set orders around that limit order level.



It is your decision to determine which type of trader you would rather be. You can try out both types of trading and see which method leads to greater profits, less stress, and allows for more time for other activities. Some traders may find that setting orders and entering into a position only if those orders are triggered can allow them more freedom. Other traders may like to strike when the iron is hot and enter a position when the market is favorable. The choice is up to you.

Data Links

- ★ Free Bitcoin Bid Ask Sum Site #2 (BAS)
<https://bidasksum.com>
 - ★ Bitcoin MDR
<https://vcdepth.io/coins/bitcoin-btc>
-

Chapter 8. Advanced Order Flow

8.1 Next Level

Take a look at a picture or video of the computer screens at a prop-trading desk or at a hedge fund. You can do a quick google image search for this. You will see many complex charts and figures that look almost incomprehensible. However, take a successful institutional trader and show them that exact data, and they would be able to diagnose the market and have a clear plan for how to trade it in just a few minutes.

As stated throughout this guide, if you look at what most other retail traders look at for market data, you will likely receive similar results to what they receive. If you look at the data that the few traders who consistently succeed are looking at, then you will likely receive similar results to what they receive once you get to their level. To get to their level, you must put in enough practice to fully understand the edge behind the strategy you are using.

This advanced order flow section has two purposes: scalping and for order placement. You can use advanced order flow and can combine order depth indicators with order flow so that your analysis covers both limit orders and market orders.



8.2 The DOM and Supply/Demand Imbalances

The DOM stands for the depth of market. Think of the DOM as a more advanced version of the limit order book. The picture below is a setup of the DOM on ETHUSD Bitmex. The platform ATAS allows for a DOM analysis on any coin that you would like.



On the far left of the DOM above (in black) is the volume profile of the order book. This shows all transacted volume within the current day. The farther to the left the black histogram goes, the greater the volume that was transacted at that price level.

The column to the right of the volume profile (says “Bid Change”) shows the difference between the bids placed at that level and the bids pulled from that level. These depth changes inform us how the limit buys have increased in strength (positive number) or decreased in strength (negative number).



The first column (in white, with shades of blue) shows the active bid orders. The values represent the present amount of contracts bidden at that level, showing how many contracts are trying to be bought at each price level.

The column to the right (says MKT in red) shows the market sells at various price levels. These values are tracked only when the DOM is open, whereas the volume profile is tracked at all times.

The column one more to the right (in black) shows the prices of ETHUSD, this is where it says 161.4, 161.45, 161.5 etc. The purple shaded value is the last traded price.

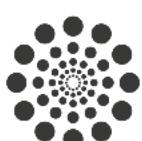
The column to the right (says MKT in green) shows the market buys at various price levels. These values are tracked only when the DOM is open, whereas the volume profile is tracked at all times.

The second column (in white, with shades of red) shows the active offer orders. These values represent the present amount of contracts offered at that level, informing us of how many contracts are trying to be sold at each price level.

The column on the far right (in red) shows the difference between the offers placed at that level and the offers pulled from that level. These depth changes inform us of how the limit sells have increased in strength (positive number) or decreased in strength (negative number).

There are many strategies that you can use when interpreting the DOM. Let's start with two supply and demand strategies: limit order imbalances and market order imbalances.

A limit order imbalance occurs on the DOM when either the bid volume near price is greater than the offer volume, or when the offer volume near price is larger than the bid volume. Within the picture above, there is a clear limit order imbalance in which the best offer (best offer = offer at bottom of order book) is much larger than the best bid (best bid = bid at top of the order book). Notice this by looking at the immense red shading of the best offer compared to the little blue shading of the best bid.



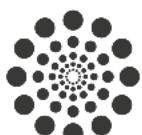
So far, we have looked into various types of limit order imbalances (for example, order depth). However, we have not yet discussed market order imbalances that reveal market aggression. A market order imbalance does not look at the bid volume and the offer volume, but rather compares the present amount of market buying to the present amount of market selling. A demand imbalance can occur when there is more market buying than market selling. A supply imbalance can occur when there is more market selling than market buying.

When we look for market order imbalances, we look diagonally and compare the volume on the previous best offer to the best bid. Here is an example showing how to do so:

9988	160.85	50402
5200	160.80	99060
16200	160.75	20765
13017	160.70	88087
4607	160.65	5762

There was a point in time when the best bid was at 160.65 and the best offer was at 160.7. Price was bouncing between those two levels. When you compare the market buy volume at 160.7 to the market sell volume at 160.65, you can identify the large imbalance between the two volumes. There was a total of 88,087 contracts market bought at 160.7, and only 4,607 contracts market sold at 160.65. It is apparent that the buyers were more interested in buying than the sellers were interested in selling.

After the strong period of market buying at the previous offer at 160.7, the best bid was resting at 160.7, and the best offer was resting at 160.75. Now take a look at the market buy volume at 160.75 and the market sell volume at 160.7 from the picture above. There is another demand imbalance here, with 20,765 contracts market bought and 13,017 contracts market sold. After this market order imbalance that favored the buyers, price moved higher.



There was then a large amount of market buying at the new best offer at 160.8, with 99,060 contracts market bought and only 16,200 contracts market sold at 160.75. There was then yet another demand imbalance with market buys at 160.85 versus the market sells at 160.8. After this picture was taken, price continued to rise on elevated demand to a price of 162.6.

If you looked at DOM and saw this demand imbalance occurring, this is a sign that it might be a good time to buy as well. However, you may also want to look into what the short-term order depth of this coin was like, such as looking at the 1% ETH MDR. If that MDR was bullish as well, then that is a strong sign of a short-term move upward.

Whenever you look at the ladder of market buys and market sells, take a look at where there are clear supply/demand imbalances. If the market buys are consistently dominating over the market sells, price is likely to rise. If the market sells are consistently dominating over the market buys, price is likely to fall.

1050	253.30	1814
1150	253.25	4
	253.20	5114
2322	253.15	
	253.10	2675
3685	253.05	

In the ETHUSD DOM above, we see a collection of multiple demand imbalances with one supply imbalance. The supply imbalance occurred when the best offer was at 253.1 (with 2,675 contracts market bought) and the best bid was at 253.05 (with 3,685 contracts market sold). The demand imbalance occurred when the best offer was at 253.2 (with 5,114 contracts market bought) and the best bid was at 253.15 (with 2,322 contracts market sold). Another demand imbalance occurred when the best offer was at 253.3 (with 1,814 contracts market bought) and the best bid was 253.25 (with 1,150 contracts market sold).



As a result of demand mostly dominating over supply, price rallied around 20 minutes later to a high at 254.15. After price made this high, notice the many supply imbalances that occurred in the midsection of the DOM below. As a result, price moved lower to a last traded price at 253.35.

	254.15	2410
2550	254.10	
12	254.05	
	254.00	1500
1123	253.95	26
1471	253.90	3986
2343	253.85	1951
4288	253.80	
3663	253.75	
1795	253.70	
1975	253.65	488
5692	253.60	1000
3015	253.55	50
	253.50	1209
4563	253.45	962
300	253.40	874
3074	253.35	20

Gaps in the DOM market orders' column occur because the market moved past that price level without a trade being made. For example, the previous offer prices of 253.7, 253.75, and 253.8 did not see any market buy volume. In fact, a market buy had occurred at 253.65 and the next market buy was at 253.85. This occurred because the limit sell order depth from 253.7 to 253.8 was pulled as price rose. Typically, this is a sign of bullish strength. It would be a sign of bearish strength if you had seen that previous bid prices did not have any market sells, the market fell through those levels, and, consequently, there would be a gap in the market sell side of the DOM. This happened at the price of 253.5, where market selling occurred at 253.55 and then resumed at 253.45.



When the market buys are dominating over the market sells, price falls. When market sells are dominating over the market buys, price rises. This shows a divergence between the buy/sell volume and price's current trend. This can also show a weakening of the present trend - the buyers and the sellers are continuing to fight even as price is trending that can lead to a period of consolidation, a market reversal, or a complete stopping of the present trend. However if you do not want to look at a DOM all day, there are other indicators that we can use that also reveal the market's aggression such as stacked imbalances and delta.

8.3 The DOM and Depth Changes

An often-overlooked element of a DOM are the depth changes that it reveals. Recall that the change in bids is represented by the far left column in green and the change in offers is represented by the far right column in red. Throughout this guide, we have been interpreting present supply/demand by reading the limit order book. However, it can be helpful to also locate the short-term placements/pulls in limit orders that occur.

Looking at these depth changes, you can analyze how the shape of the order book depth is changing. Many bids added and offers pulled in the local order book shows an increase in the strength of the bidders and in a decrease in the strength of the offerers. Consequently, price is likely to rise. The opposite (offers added and bids pulled) shows an increase in the strength of the sellers and a decrease in the strength of the buyers. Consequently, price is likely to drop.

739898	714200	175.15	43244	10475
135300	286563	175.10	68151	-44746
235734	282945	175.05	4635	-50609
179311	72205	175.00		-11528
		23126		-93464
		58747		-19987
		35239		214406
		4166		
		174.95		
		174.90		
		174.85		
		19713		

The green column on the far left shows how many contracts were added/pulled in bids and the red column on the far right shows many contracts were added/pulled in offers.



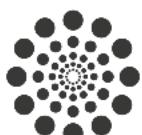
Additionally, the depth changes in offers that are below price are depth changes made before price rose (meaning the offer changes at 175, 174.95, 174.9, and 174.85). Any depth changes in bids that are above price are depth changes were made before price fell (if there were any bid changes at 175.05, 175.1, 175.15).

Notice the offers that were pulled at 175.05, 175.1, and 175.15. From those bottom three offers, a total of 84,880 contracts were pulled. This is a reduction in the local supply of the market. Notice the bids added at 175, 174.95, and 174.9. From these top three bids, a total of 1,110,932 contracts were added. This shows an increase in demand.

The added bids in conjunction with the pulled offers show that the market is likely to rise. Not surprisingly, the market here rose to a price high of 175.55 within a span of a few minutes as shown in the DOM below.

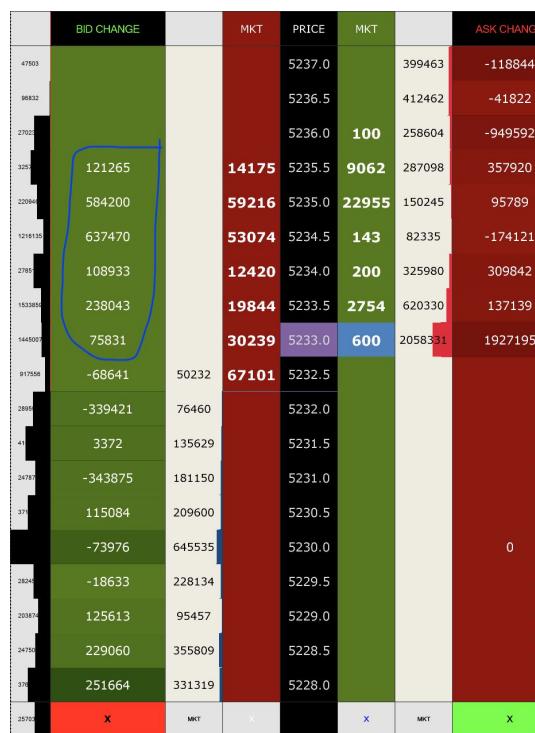
	BID CHANGE	MKT	PRICE	MKT	
1144941			175.90	75883	109721
572590			175.85	223160	216060
1056169			175.80	215678	195654
769555			175.75	95825	-3178
359411			175.70	96619	70922
559785			175.65	111633	22923
852399			175.60	26044	-107183
693478			175.55	48696	6627
1507497	113392	86425	175.50	5447	17205
733294	503193	602710	175.45	19194	-356472
1418730	462592	318239	175.40	45650	190886
1018589	603306	518102	175.35	54539	-72886
23101	234064	78596	175.30	38797	-8410
1941394	187863	102522	175.25	32730	316336
3272	1188654	108568	175.20	24371	896635
1354029	249029	205354	175.15	74354	71117
1047947	-147023	69042	175.10	21658	123618
1056852	298168	63541	2000	175.05	33336
23080	269851	44392	600	175.00	23126
1517800	-268430	52506	174.95	58747	-93464

When you notice an instance in which price moved lower, but you see depth changes in bids above the current price that are positive, this is a sign of bullish strength as it shows the buyers' willingness to place more limit orders at those levels than they had pulled. If you see price fall, but the depth changes in bids above the current price are



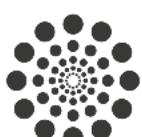
negative, this is a sign of bearish strength. It shows that as price fell, many potential buyers had pulled their limit buy orders.

On the flipside, when you notice an instance in which price moved higher, but you see depth changes in offers below the current price that are positive, this is a sign of bearish strength as it shows the sellers' willingness to place more orders at those levels than they had pulled. If you see price rise, but the depth changes in offers below the current price are negative, this is a sign of bullish strength. It shows that as price rose, many potential sellers had pulled their limit sell orders.



Take a look at the blue circled portion above. More bids were placed than pulled at all current prices tracked above the current market price. This is a bullish sign for the market as it shows the buyers' willingness to allow their bids to fill without cancellation. Shortly after this picture was taken price moved higher.

The DOM provides us with advanced order book insight that can provide a clear picture of three different types of local supply/demand: market order imbalances, present order depth, and changes in the bids/changes in the offers. Mastering these individual elements of DOM reading can strengthen your ability to gauge short-term market moves,



as well as help with getting your limit order filled and your market orders timed correctly during supply/demand runs.

8.4 The DOM and the Volume Profile

The volume profile (far left column in black) shows historical volume transacted within the period of your choice. The current setup for the DOM presented in this guide shows a volume profile from the current day's volume. We can use this historical volume to identify strong/weak price zones.

When you see a cluster of prices that have a large amount of volume traded, those areas will typically act as strong price areas or price will likely struggle to move past that cluster of high volume.

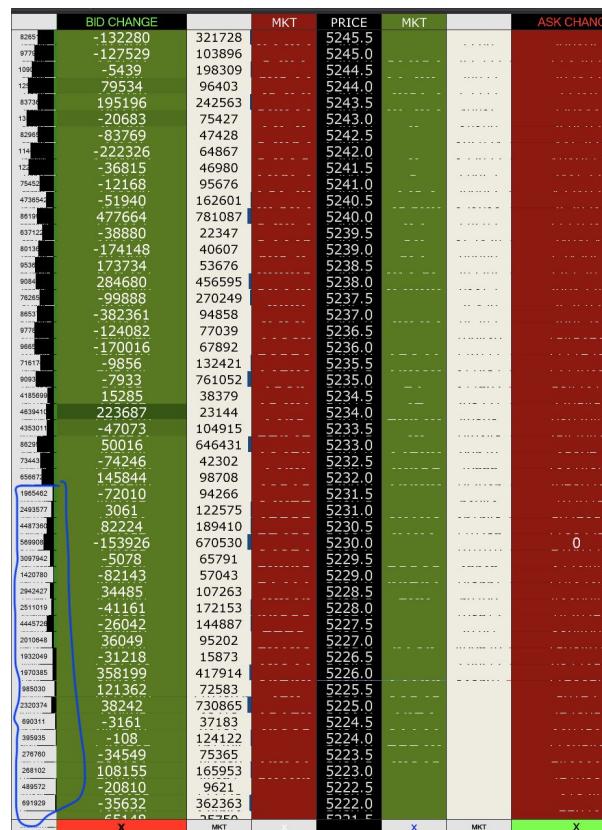
	BID CHANGE	MKT	PRICE	MKT	ASK CHANGE
2306234	338216	7421	5295.0	17275	55629
210200	229515	42706	5294.5	46419	-48921
215987	70672	4116	5294.0	24839	-332032
256729	-55458	200	5293.5	27609	370655
214704	56230	256957	201	5293.0	217428
203173	77474	29225	1000	5292.5	-183630
199883	480658	25531	43336	5292.0	207277
227141	360962	3140	599	13148	1022162
282778	401498	44656	10003	5291.5	-226620
228554	257442	31848	5291.0	38161	208411
737170	195532	21934	3000	5290.0	-67429
368570	57191	34254	86396	55124	-529053
000714	-326155	123405	5289.0	30934	90610
3301543	-487472	36876	5288.5		-49472
70582	-125599	22172	5288.0		-9832
3519154	47822	161170	5287.5		11196
2722249	373	26147	5287.0		94009
2007781	-36163	24478	5286.5		75674
2182024	-50129	88663	5286.0		43477
2270707	-63928	174448	5285.5		32189
051514	-128108	434973	5285.0		93225
65790	-30300	48327	5284.5		-5926
64284	-39760	249344	5284.0		-209942
328912	72231	69230	5283.5		-66079
098093	-47454	44836	5283.0		101644
1584341	-49027	17766	5282.5		34820
79842	-75554	93291	5282.0		76897
030282	20413	67513	5281.5		-23093
15	-23103	168253	5281.0		-39956
50184	-151289	181547	5280.5		:31824
1	-60122	248048	5280.0		-66973
007461	-11218	68035	5279.5		-49435
29815	239146	381514	5279.0		15304
113301	5030	83631	5278.5		17089
648	9649	186587	5278.0		153295
09162	-18650	42460	5277.5		14645
240602	-89004	109109	5277.0		-287280
045702	-76766	38682	5276.5	14408	-890335
695	593963	314727	64620	73745	936922
03722	1261628	48454	755	744	-4374
195	-359714	145088	8422	32610	-57855
317931	129291	6851	5275.0	19521	157857
117881	73592	62932	5274.0		
101859	172559		5273.5		
91235	1181510		5273.0		
63659	52881		5272.5		
291987	78598		5272.0		
521124	62088		5271.5		
20262				X	
		MKT		X	
				MKT	
					X

Take a look at the volume transacted from the prices of 5272 up to 5276 (as indicated by the circle in blue). If price was to trade back down to those price levels, these price areas would likely act as support, and price would reverse or consolidate. The reasoning behind this is that if there is a large amount of volume transacted in a certain price range, we know two things: traders historically showed that they were interested in trading at this level, and that there could be many trapped traders after price had moved



away from this area. (Trapped traders are traders who are holding unrealized unprofitable positions). When price returns to a zone where many trapped traders had entered, that area acts as support/resistance as the trapped traders exit their positions at breakeven.

A high volume area is where many traders have transacted and a low volume area is where not many traders have transacted. In the future, price will likely move slowly through areas where traders showed significant interest (as indicated by large volume spots in the volume profile). This occurs when many traders are interested in trading at a series of price levels and, consequently, there are many large limit orders located within that price range. This will slow price's progress in that direction. Contrarily, price will likely move rapidly through areas where traders showed significant disinterest. This occurs because when many traders are disinterested in trading at a series of price levels, there are likely not many limit orders within that price area, meaning that price could be able to rapidly move through that price area without much of a struggle.



The blue circled portion in the figure above shows a low volume price area. The price moved down from 5245.5 down to 5232 during the day's trading and there is a



significant amount of volume, but below this price range, there were not many transactions made during the day. This means that if price was to trade down to this price area, price would likely move rapidly through it (from 5231.5 and below).

There are two ways in which price can move through a low volume area, as indicated by the volume profile: with a high momentum continuation price move or with a price tail. Here is an example of a continuation pattern that can occur:



There is a period of low volume below the prices of 5120. Price moves lower and quickly cuts through that low volume area.

Here is an example of a price tail pattern that can occur:





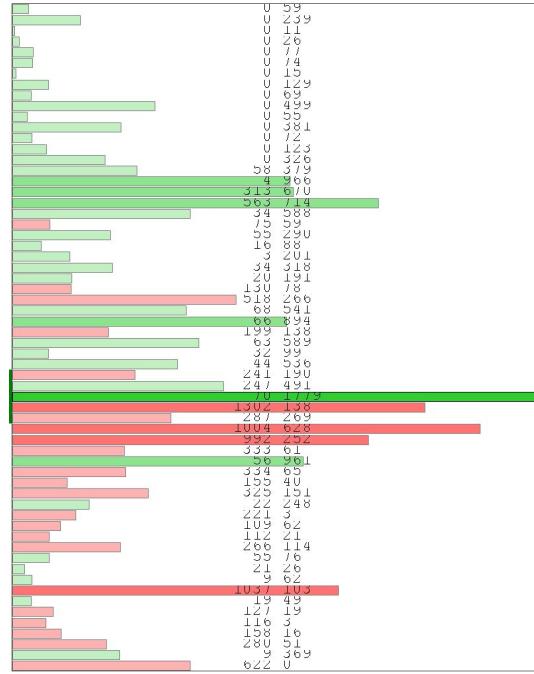
There is a period of low volume below the prices of 4700. Price moves lower and quickly cuts through that low volume area.

The two examples above showed what can occur within a price area of low volume when price moved lower. The same patterns can occur to upside low volume areas, as price can make a price tail upward or a strong continuation pattern upward in the same manner as it would at lower prices.

For a more medium-term trading setup, you can also look at a DOM volume profile set to the current week. However, remember to also use a current day volume profile in conjunction with the current week volume profile, so that you can see which prices have recently seen a large amount of volume during a day's trading.

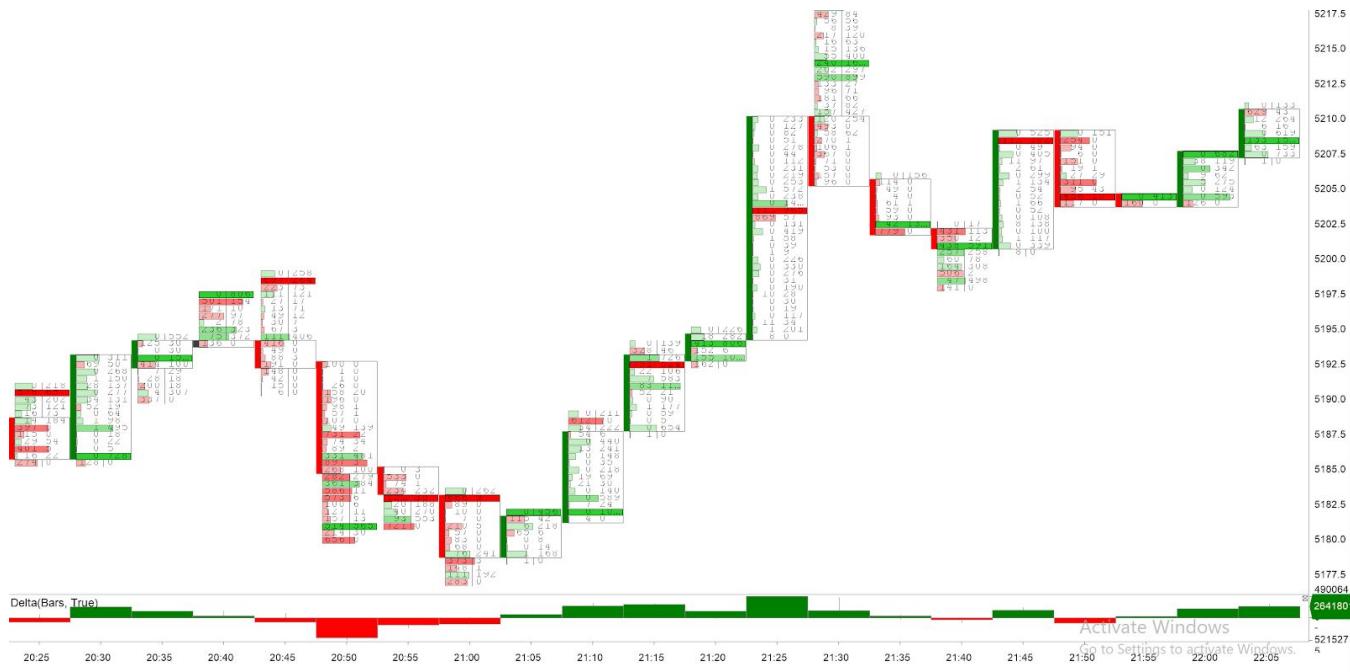
8.5 Delta and the Candlestick Volume Profile





The figure above shows trading on Bitmex XBTUSD during a 5-minute period. The centered numbers on the left show how many contracts have been sold and the centered numbers on the right show how many contracts have been bought (in denominations of 1000 contracts). However, take a look at the volume profile coloring. The horizontal red shading shows the amount of selling that occurred at a price level and the horizontal green shading shows the amount of buying that occurred at a price level.





In the picture above that shows XBTUSD on the 5-minute timeframe, “Delta (Bars,True)” in the bottom left portion of the chart shows the difference between the market buy volume and market sell volume during a candlestick of trading. When there is more market buy volume on a candlestick, this means that the market is bullish (delta turns green). When there is more market sell volume on a candlestick, this means that the market is bearish (delta turns red). This allows us to easily visualize the battle between the market buyers and market sellers. Notice the dominant sell delta that led to a downtrend from 20:45 to 21:00, and the dominant buy delta that led to an uptrend from 21:05 to 21:35.

Take a look within each candlestick and their corresponding volume profiles. You will notice many dark green lines shaded fully from the left side to the right side of a candlestick during an uptrend. This shows significant market buying at that price level. You will also see many dark red lines shaded fully from the left side to the right side of a candlestick during a downtrend. This shows significant market selling at that price level.

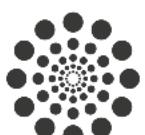
Another pattern to note when using volume deltas is that of a trend reversal. An uptrend tends to reverse when all interested buyers have bought and a downtrend tends to reverse when all interested sellers have sold. To spot this, first identify the dominant



trend. Remember that overbought/oversold reversals tend to take place after a consistent trend and typically not during a trend that had just emerged (that could be a breakout). Then, compare the current candlestick delta to the previous delta throughout the trend. It's not uncommon to see the most positive delta at the top of an uptrend or the most negative delta at the bottom of a downtrend. Take a look at the example below on the 1-minute timeframe.



Price rapidly moves lower on high volatility and a very negative delta (as indicated by the blue circle) late in a downtrend. This led to a move back upward as the sellers were exhausted.





Take a look at the four extreme positive deltas in the chart above (each circled in black). Each time there was a significant amount of market buying, price either retraced or reversed.



In the chart above on the first blue circle (at 20:04), price moved lower on high volatility with a very negative delta. This led to a sustained move higher as the sellers lost interest. The second blue circle shows a spike in the positive delta. However, this was



still early in the uptrend and price continued to rise after a quick pullback lower. The third and final blue circle showed a spike in the positive delta and a rapid rise in volatility, which led to a move lower.

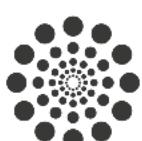
Note that you can use the volume-profile on a chart and delta patterns mentioned above across various timeframes, not just on the 1-minute and 5-minute.

When interpreting volume delta it can be difficult to discern between a continuation and a reversal. For help, take a look at past delta patterns on the coin of your choice and note which times led to a reversal and which times led to a continuation. If you note that instead of average or small positive/negative deltas leading to continuations in the direction of the delta, they lead to reversals instead, then exploit this pattern in the future. If you note that large positive/negative deltas tend to lead to continuations and not reversals, then exploit this pattern instead.

The rules listed within this section pertain to the patterns that have historically been profitable on top market cap coins, but never forget to do your own research and backtesting in order to be best prepared for the future.

8.6 Stacked Imbalances

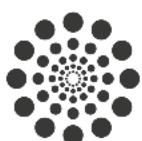
If instead of screening each candlestick volume profile to identify whether the buyers or sellers are in control, you would rather have an indicator that does it, then use the *stacked imbalance indicator* on your advanced charting platform. You may want to use transparent candles for more clarity. A buy-side stacked imbalance occurs when there is significantly more market buying on the historically best offer than there is market selling on the historically best bid. A sell-side stacked imbalance occurs when there is significantly more market selling on the historically best bid than there is market buying on the historically best offer. This concept is the same as the market order supply/demand imbalance that was highlighted in the previous section.

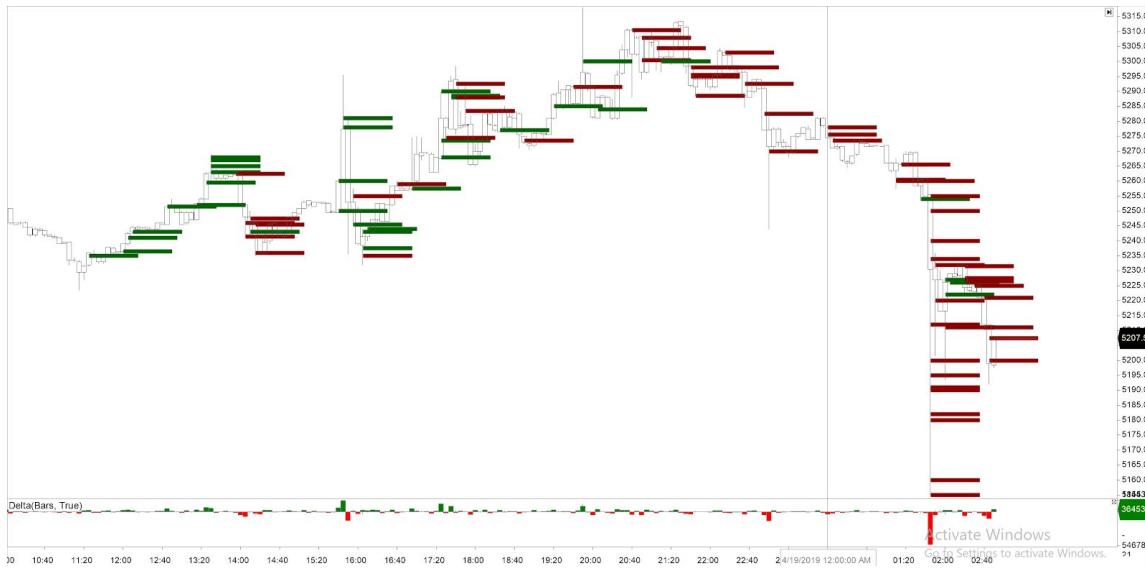




The chart above shows XBTUSD on the 5-minute time frame, with stacked imbalances of at least a 3x imbalance ratio shown with minimum imbalance volume set at 100,000. When the stacked imbalance is green, this means that the market buying on the best offer was at least 3x larger than the market selling on the best bid at that point in time, and there was at least 100,000 volume in contracts transacted within that imbalanced level. When the stacked imbalance is red, this means that the market selling on the best bid was at least 3x larger than the market buying on the best offer at that point in time, and carried at least 100,000 volume in contracts upon that imbalanced level.

Stacked imbalances can make it easier to identify whether the buyers or sellers are dominant. Notice that when the stacked imbalances were green, price typically rose. When the stacked imbalances were red, price typically fell.



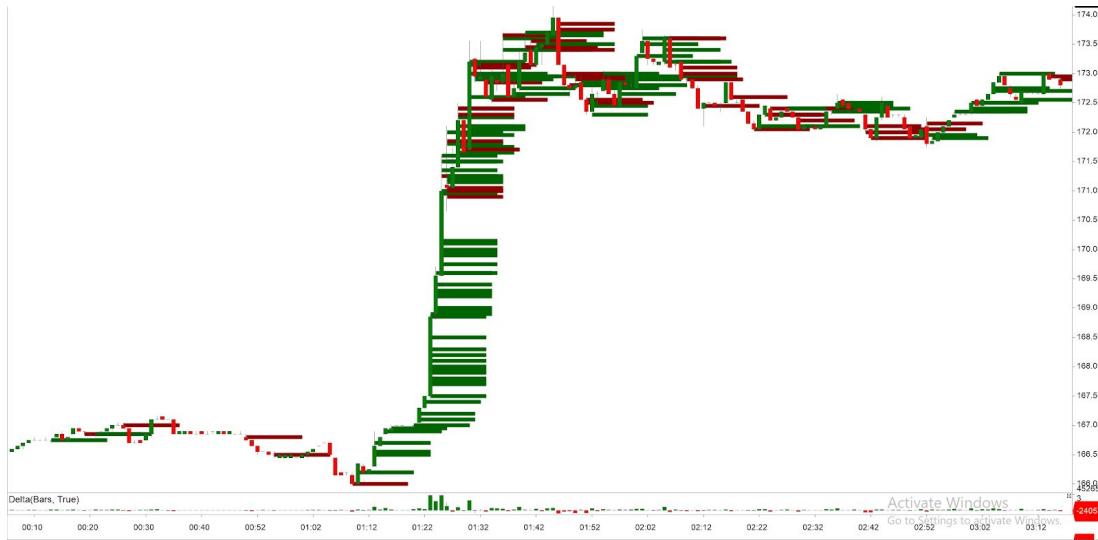


Here is another example of XBTUSD on the 5-minute chart. Notice that the uptrend on the far left portion of the screen began with a series of buy-side (green) stacked imbalances. This uptrend was then terminated and a downtrend began with a series of sell-side (red) stacked imbalances.

You can also use stacked imbalances to know when to refrain from trading against the trend. If you see a series of buy-side stacked imbalances in an uptrend without many sell-side stacked imbalances, this is a sign that the buyers are in control and going short might not be the best idea. Additionally, if you see a series of sell-side stacked imbalances in a downtrend without any buy-side stacked imbalances, this is a sign that the sellers are in control and going long might not be the best idea.

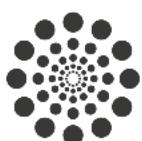
The chart below shows ETHUSD on the 1-minute with stacked imbalances of at least a 3x imbalance ratio and minimum volume set at 100,000.

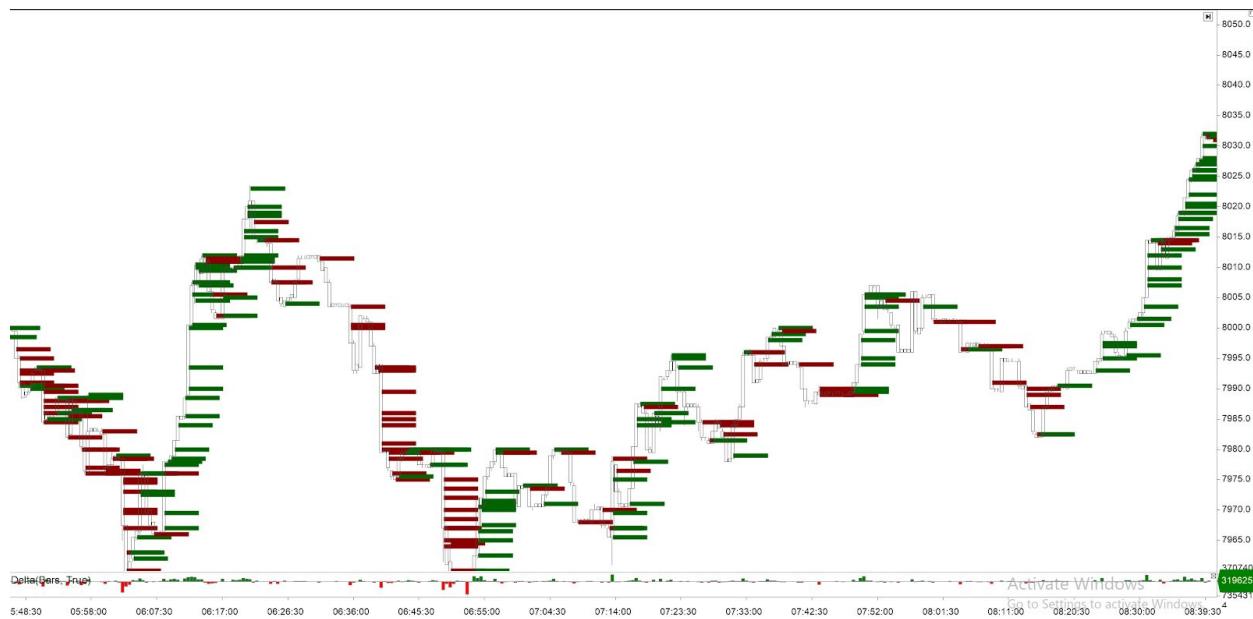




Notice the uptrend that began at around 1:12 with a series of green stacked imbalances. The market moved much higher on this heavy market buying. There were a few red stacked imbalances about $\frac{3}{4}$ of the uptrend upward at around the price of 171. This heavy buying resumed and price continued to move higher until a period of consolidation emerged where we began to see many red stacked imbalances appear at the top of the trend.

Buying at some point during the the uptrend and then selling/entering short once the red stacked imbalances came in would have been the most profitable route to take. Additionally, when price was making its rapid rise upward and there were very few red stacked imbalances: this is a clear sign that it is probably not a great idea to trade against the trend during that rise with a short position.





From the picture above, do you notice that the present trend has had many buy-side or sell-side stacked imbalances? What does this say about the future direction of price?



The arrow in the graph above points to where price was in the first graph. Price continued the uptrend higher after many buy-side stacked imbalances.



Market aggression and market order activity is what physically moves markets. Taking a look at recent market aggression history can reveal whether the buyers or sellers have control. Master a market aggression analysis and you can find yourself on the right side of the trend more often than not.

Data Links

- ★ ATAS: *Within the ATAS platform, the Smart-DOM is used and the standard chart is used.* <https://orderflowtrading.net/atas-crypto/>
 - ★ Ethereum MDR Order Depth
<https://vcdepth.io/coins/ethereum-eth>
-

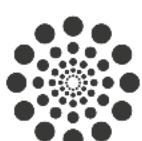
Chapter 9. The Heatmap

9.1 The Advantage

The heatmap is a wonderful intersection between chart-reading and DOM-reading. Heatmap trading is used by traders who want to not only visualize the aggression of the market (market orders), but also visualize the depth and location of various limit orders in the limit order book. A major issue with solely trading a chart of price and volume is that you are not given total information on what had occurred on the historical order book. An issue with just reading the DOM is the mass amount of data-based information received and a lack of visuals can make interpretation hard at times. A heatmap acts as the middle ground between these two extremes.

Throughout this guide, heatmaps have been used to illustrate various purposes as covered within the chapter on spoofing and in the chapter on supply/demand runs. This chapter will provide a more totalistic approach of trading off of the information given from heatmaps/historical DOM levels.

There are two different types of heatmaps that you can analyze: short-term and medium-term. An example of a medium-term heatmap (5-minute timeframe) is this chart from Tensorcharts that was covered earlier in this guide:





The focus of this chapter will be on mostly short-term heatmaps/DOM levels. When looking at short-term heatmaps, we are able to locate spoofing plays, best bid/offer dominance, supply/demand runs, placements/pulls of large limit orders, as well as many other methods that you can use to exploit patterns that you find in the historical DOM.

As a final note, remember that heatmaps and DOM visualizations represent just half of the picture of the market. The other half of the market can be read by looking at the market's aggression (as covered in the chapter on advanced order flow).

9.2 Best Bid vs Best Offer

Recall that the “best bid” is the highest bidded price in the limit order book and that the “best offer” is the lowest offered price in the limit order book. Whether price will remain in a trend or a period of consolidation will transition into a trend can be revealed by looking at how strong the best bid was during a demand run and how strong the best offer was during a supply run.

The ATAS charts covered in this chapter will be using transparent candlesticks. This is used so that you can clearly identify the strength of certain DOM levels. Remember for the limit sell orders: red = large offer, purple = medium sized offer, and



the white space shows where not many offers are. For the limit buy orders: blue = large bid, light blue = medium sized bid, and the white space shows where not many bids are.

When determining the strength of the buyers/strength of the sellers, we look at two factors:

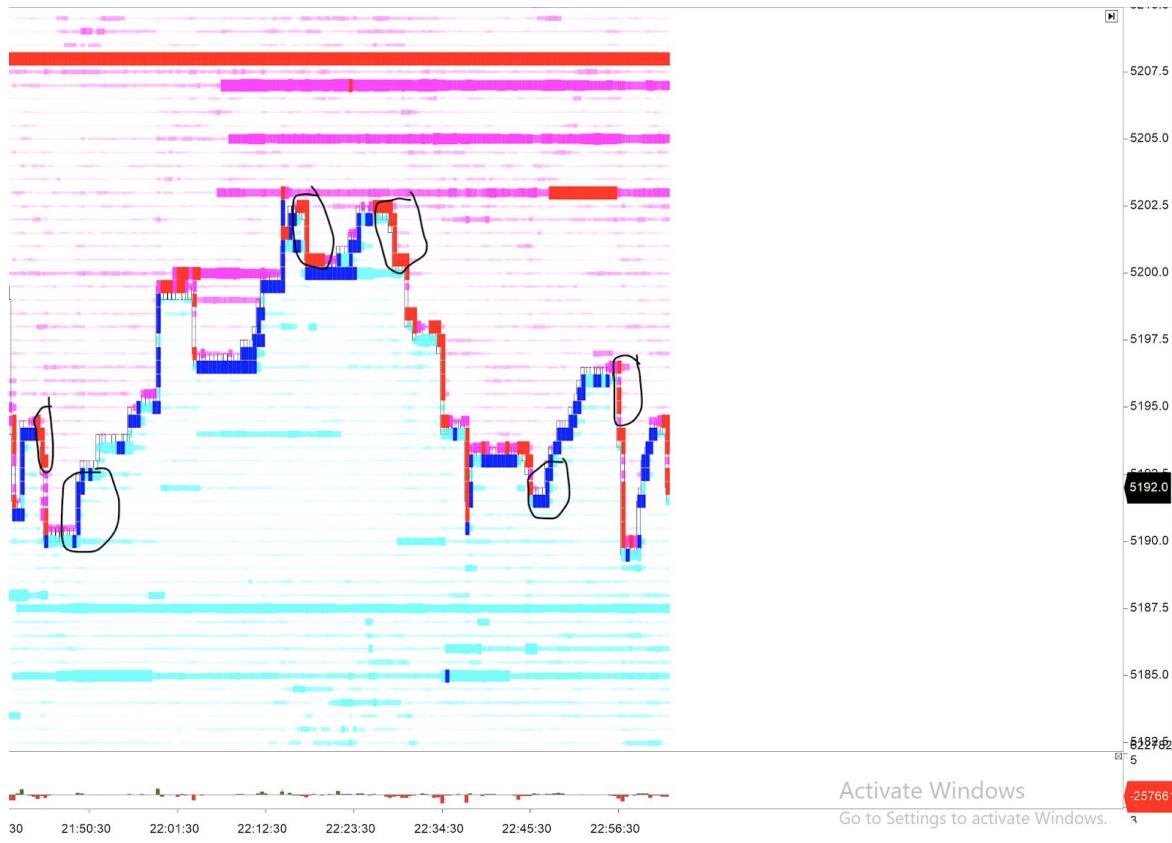
For demand (strength of the buyers):

1. Time spent where the best bid remained the best bid as price moved upward.
2. Order depth size of the best bid as price moved upward.

For supply (strength of the sellers):

1. Time spent where the best offer remained the best offer as price moved downward.
2. Order depth size of the best offer as price moved downward.

Take a look at the chart below, but just focus on the historical best bid and best offer. In this 30-second chart, the price and time are included as well.



Take a look at the six black circles from left to right. Each indicates a point in time where the best bid or the best offer was strong.

In the first black circle (far left portion of the chart), we see the best offer push price lower. However, notice that when price fell, a large bid was placed at 5190 (blue) and this eventually led to the uptrend that began in the second black circle.

The second black circle showed a significant amount of demand as price begins its ascent upward on strong bidding. Price continued to rise as the sellers were disinterested.

The third black circle showed where the sellers finally took interest and the best offer was able to push price lower before price moved back to its previous high.

The fourth black circle showed a similar situation that occurred on the third black circle, where sellers regained interest and a downtrend began. This pattern continued as price fell until the fifth black circle.

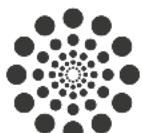
At the fifth black circle, the buyers regained interest and we see the best bid carry price upward.

The sixth and final black circle showed where once again the sellers regained control and we saw a large best offer that was able to push price lower. After this picture was taken, price continued to fall.

Looking at the effect that a large best bid has on price and the effect that a large best offer has on price can be a great way to gauge supply/demand runs as well as the future price. In the next section, we will look into another method that traders use to decide price's future direction.

9.3 Influx/Outflux of Supply/Demand

Some traders hold fast to the belief that the present supply/demand that can be read by looking at the limit order book does not give an accurate reading of the actual supply/demand. Rather, they believe that looking at the placements and pulls of the bids/offers gives a better indication of the supply/demand of the asset, and ultimately, where price will likely trend toward next.



Take a look at the picture below. Instead of analyzing the historical best bid/best offer, take a look at the bid and offer levels that were placed or pulled away from the presently traded price.



There are three events that occurred that may have contributed to price's downmove from its previous state of consolidation.

First, there was a series of large limit sell walls that were placed as indicated by the line "3 Large/Mid-sized Offers placed." More importantly, notice *when* these large limit sell orders were placed: just as price was making a short-term price top. After being placed, price respected these levels and moved to the downside.

Second, notice the four short red lines that are circled. This may have been a spoofing play in which a large limit sell was first placed and then cancelled, then a new large limit sell was placed just below the old one and this pattern continued four times. On the fourth and final indicated circle, the limit sell was placed quite close to price and price tested this level before rapidly moving to the downside.

Third, notice the lack of bidding that occurred below price. During the majority of consolidation, there was not much placement of any large or mid-sized bid orders. This represented a lack of buying interest and as a result, price was able to move rapidly lower.



The takeaway from these three events is:

1. Notice when large limit orders are placed. This is tracking the influx of supply/demand. It is not uncommon for the sudden placement of a large limit sell or many large limit sells to press price lower or for the sudden placement of a large limit buy or many large limit buys to push price higher.
2. Notice when large limit orders are cancelled. This is tracking the outflux of supply/demand. When a large limit sell or many large limit sells are cancelled, this can make it easier for price to rise. When a large limit buy or many large limit buys are cancelled, this can make it easier for price to fall.
3. Notice when there is a historical vacancy of limit orders in a certain price region (this type of event was highlighted in the picture example above). A historical vacancy of limit orders in a price region allows for price to quickly cut through that indicated region. If you look on a heatmap and see very few or no large limit orders that were placed in a price zone, watch out for price to power through and beyond that zone.

This type of heatmap analysis is similar to reading the placement/pulls of limit orders on the DOM. However, this analysis allows for a more medium-term trading approach than just reading a DOM. As with other sections in this guide, backtest heavily on the placement/pulls of large bids and offers on the coin that you are trading. For, tracking a coin's historical change in supply/demand through backtesting and consistent practice will best prepare you for trading that coin in the future.

9.4 Local Supply/Demand from a Heatmap

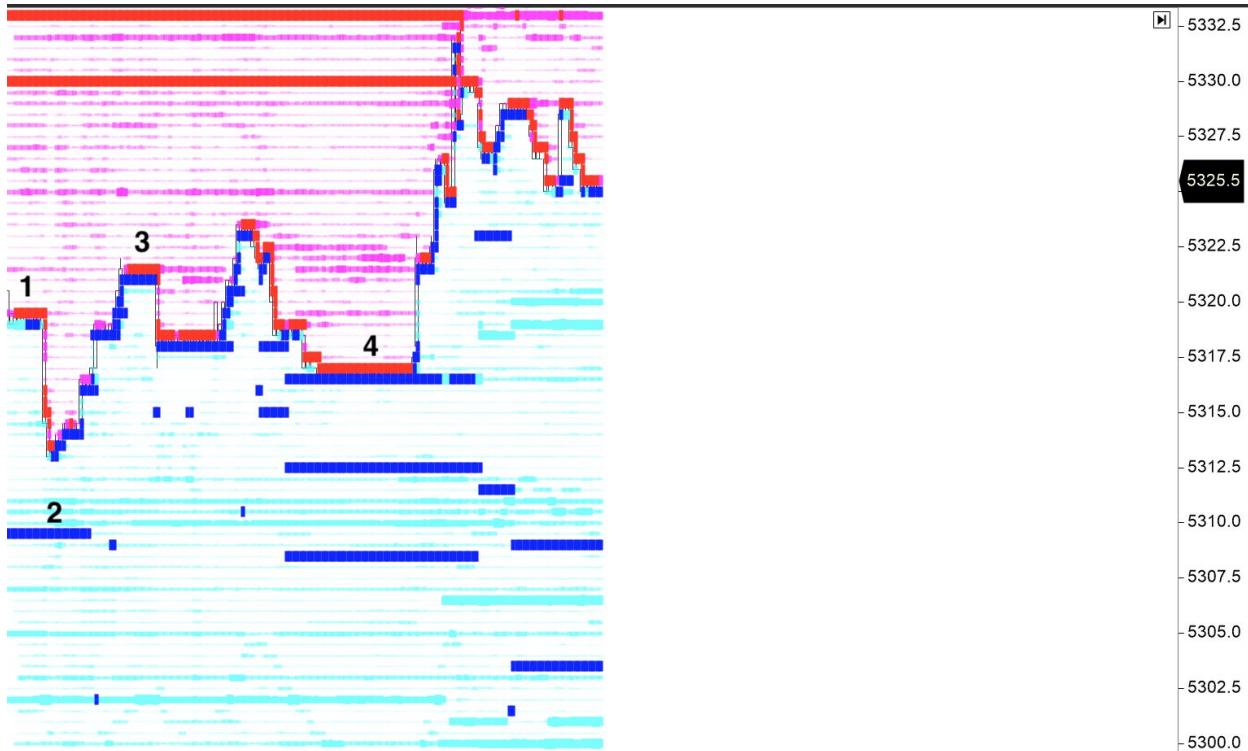
Thus far, we have looked into the advantages that a heatmap brings, the battles between the best bid and best offer, and the influx/outflux of supply and demand. Now, let's take a look at the levels of present supply and demand as gauged by the DOM levels on the heatmap.

As mentioned in the beginning of this chapter, you must make sure to remember that DOM levels/heatmap reading must be supplemented with an analysis of the aggression of the market. You can track market aggression by looking at delta (market



buy volume - market sell volume), cluster charts (visualization of market orders), or stacked imbalances (imbalances of market buys and market sells).

Now, let's take a look at a snapshot of the local supply and demand of an asset by looking at its DOM levels. Pay particular attention to the size of the bids/offers that are near price to gauge the asset's local supply/demand.



Focus on each of the 4 numbers above, especially on the large bids and large offers near price. In this section, we are not looking at the addition/subtraction of bids and offers, but rather the supply and demand that was reflected at a certain point in time.

At point 1, we see a large bid at 5309 and a large offer at 5319. Price is trading around 5319 and subsequently falls on strong supply (the offer was closer to the last traded price than the bid was).

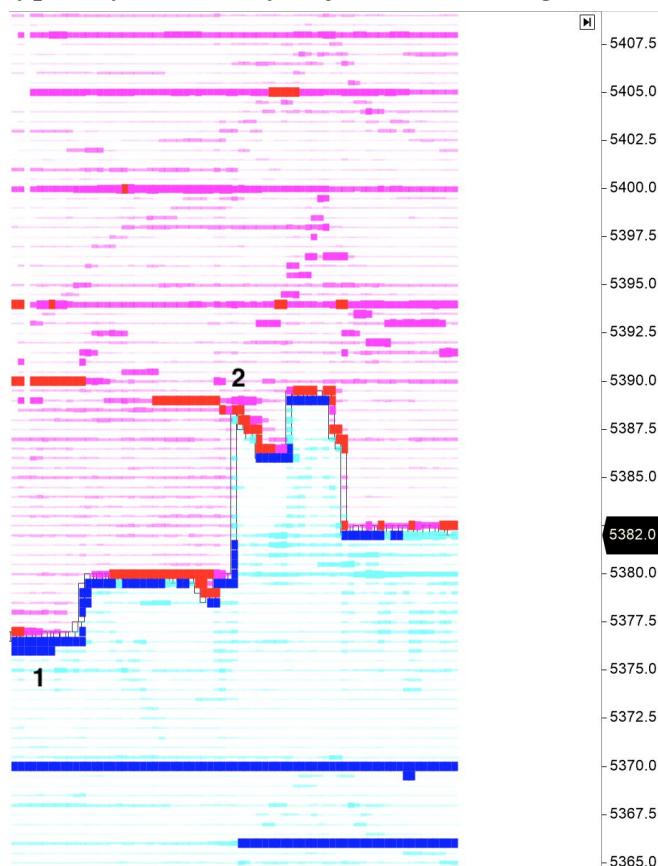
At point 2, we see the same large bid that was present in point 1, however there are no large or medium-sized offers active near price. Price subsequently rises.



At point 3, the bids and the offers near price are relatively equal. There was a recent demand run that carried price from 5313 up to 5321. The best bid and best offer are both quite large and the result is active equilibrium. The bid dies out and price falls slightly before rising again.

At point 4, the bids are quite aggressive and the only large offer near price eventually falls after strong market buying. Notice the 3 levels of large bids at 5308.5, 5312.5, and 5317 (the largest bid was the best bid, the highest bid in the order book). The result of this demand is an uptrend that rises in the short-term with little resistance until the first large offer wall at 5330 is met by price.

What can be gleaned from the chart above is that when reading the heatmap, it is vital to keep track of the supply and demand near price. Large order book walls near price will typically have more of an effect on price than large order book walls that are located farther away from price. You can think about the supply/demand of the heatmap as if it were a battle between two forces. In this battle, the force with the numbers advantage will typically win, so try to join the winning side when trading.



Focus on the 2 numbers above, especially on the large bids and large offers near price.

In point 1, we see three prominent bid walls: 5370, 5376, 5376.5 (best bid). However, the only large present offer wall that we see is located at 5390.5. Consequently, price rises on the strong demand.

In point 2, we see only a large bid wall at 5370 with very little demand near the current price. However, we see two large offers: one at 5388.5 (best offer) and at 5389. Consequently, price falls on the strong supply near the last traded price.

Use the present supply/demand from the heatmap to gauge whether price will have an easier time moving higher or lower. After determining this, look at market aggression to see which direction price is trending. If both heatmap supply/demand and market aggression are in confluence, then you can look for a supply/demand run to execute a limit order of your own.

Data Links

- ★ *Within the ATAS platform, the DOM levels on the standard chart is used. Tensorcharts is used for the heatmap as well.*
-

Chapter 10. Execution

10.1 An Infinite Variability

There are countless different ways to trade the flow of information that stems from the order book. These strategies run from something as simple as detecting order imbalances and exploiting them to as complex as using advanced order flow platforms with the DOM. There is no perfect setup, no specific combination of settings or indicators that will always yield a profit. Gaining an information edge in the cryptocurrency market comes from finding a few tools/strategies that you believe will work well for your own trading personality and then practicing and mastering those tools/strategies.



Personally, what I have found to be the best strategy is a combination of indicators that clue you in on market order imbalances and order depth imbalances. This is covering both phases of the market: the past (looking at the aggression of the market buyers versus the market sellers) and the present (looking at live order depth to determine the current supply/demand of the market) in order to predict the future.

Specifically, this could be a combination of delta/stacked imbalances for determining market order imbalances, and the Global MDR/XBTUSD BAS for order depth imbalances. This gives you information on how many traders want to buy/sell all cryptocurrencies with limit orders (global MDR), how many traders want to buy/sell Bitcoin futures (XBTUSD BAS), and how aggressively traders have been buying/selling Bitcoin (Delta/Stacked Imbalances). This setup can also be replicated for another coin; look at the global MDR, the coin-specific BAS, and the Delta/Stacked Imbalances on that coin.

You may instead choose to look at specific order depth levels in the LOB and pair that with supply/demand runs. Or you may look to exploit the market by detecting spoofing/manipulation plays and profiting off of them. It is all up to what you find most predictive of price in the short-term, medium-term, or long-term.

The practice examples in this chapter will cover Supply/Demand Runs, Order Depth, Spoofing Identification, Support/Resistance from the LOB, Application of LOB Strategy, Advanced Order Flow, and Heatmaps.

There will also be a final section of practice exercises that you can continuously use to strengthen your pattern recognition and to perfect your trade entry/exit decision-making process.

10.2 Supply/Demand Run Practice

Supply/Demand Runs make up the individual trending movements that cryptocurrencies make in the short-term.

Recall the four different types of patterns that can occur:



A supply run occurs when large offers near price push price lower, there is a lack of bidding, and the market sellers are aggressive.

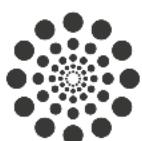
A demand run occurs when large bids near price push price higher, there is a lack of offering, and the market buyers are aggressive.

An active equilibrium is an order book pattern where price moves sideways because there is a large best bid and a large best offer. This type of equilibrium tends to lead to a period of consolidation where price bounces between only two prices.

An inactive equilibrium is an order book pattern where price moves sideways because there is a lack of aggression in the market (not much market buying/selling). This type of equilibrium tends to lead to weak price moves up and down within a mostly flat range.

1. Identification of micro market structure from a chart:

In the chart below, label each of the micro market structures 1-6 as either a *supply run*, *demand run*, *active equilibrium*, or *inactive equilibrium*.



Point 1 was a **supply run** as price slightly fell. This supply run then led to a demand run in point 2.

Point 2 was a **demand run** that led to a period of active equilibrium.

Point 3 was an **active equilibrium** as price bounced between 160.4 and 160.45. This then transitioned into a supply run.

Point 4 was a **supply run** that led to a prolonged period of inactive equilibrium.

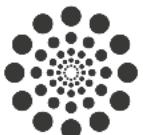
Point 5 was a period of **inactive equilibrium** as price moved from a low of 160.1 to a high of 160.25. This led to a swift supply run.

Point 6 was a strong **supply run** as price fell from its equilibrium low at 160.1 to a low of 158.55 in a matter of minutes.

2. Identification of micro market structure from the limit order book and the trades history:

Using the information below, label the pattern you see below as *supply run*, *demand run*, *active equilibrium*, or *inactive equilibrium*.

Orderbook (XBTUSD)			Recent Trades (XBTUSD)			
Price	Size	Total				
5387.5	111,020	2,597,151	5383.0	200	2:59:09	S
5387.0	121,334	2,486,131	5383.0	210	2:59:07	S
5386.5	102,238	2,364,797	5383.0	50	2:59:07	S
5386.0	113,705	2,262,559	5383.0	950	2:59:07	S
5385.5	65,286	2,148,854	5383.0	850	2:59:07	S
5385.0	25,223	2,083,568	5383.0	228	2:59:07	S
5384.5	25,509	2,058,345	5383.0	40	2:59:07	S
5384.0	539,109	2,032,836	5383.0	40	2:59:07	S
5383.5	1,493,727	1,493,727	5383.0	4,000	2:59:07	S
5383.0 ▼			5383.0	100	2:59:07	S
⌚ 5387.71 / 5387.55 ⏲			5383.0	100	2:59:07	S
5383.0	125,946	125,946	5383.0	300	2:59:07	S
5382.5	47,572	173,518	5383.0	56	2:59:07	S
5382.0	343,763	517,281	5383.0	1,132	2:59:07	S
5381.5	103,607	620,888	5383.0	2,146	2:59:07	S
5381.0	82,328	703,216	5383.0	10	2:59:07	S
5380.5	88,755	791,971	5383.0	44	2:59:07	S
5380.0	557,322	1,349,293	5383.0	1,011	2:59:07	S
5379.5	95,067	1,444,360	5383.0	645	2:59:07	S
5379.0	433,692	1,878,052	5383.0	38	2:59:07	S
			5383.0	38	2:59:07	S
			5383.0	120	2:59:07	S
			5383.0	1,279	2:59:07	S
			5383.0	1,489	2:59:07	S



This is a **supply run**. The best offer is at around 1.5 million contracts, whereas the best bid is only at around 126,000 contracts. Additionally, the total order depth of the local offers shown is 2.6 million contracts and the total order depth of the local bids shown is almost 1.9 million contracts. There were many market sells at 5383 as the aggressive sellers continued to attack the bids. After this picture, price fell further and the supply run continued.

3. Executing a trade at the best possible price using the LOB and recent trades:

You are looking to short this market. Using the information below, decide whether it would be more profitable to set a limit sell at the current best offer (5385) or better to wait to short at a higher price.

Orderbook (XBTUSD)			Recent Trades (XBTUSD)		
Price	Size	Total			
5389.0	69,108	649,568	5384.5	180	3:10:44 S
5388.5	20,060	580,460	5385.0	1,500	3:10:44 B
5388.0	63,264	560,400	5385.0	14,000	3:10:41 B
5387.5	49,187	497,136	5385.0	10,919	3:10:40 B
5387.0	83,574	447,949	5385.0	30	3:10:40 B
5386.5	30,752	364,375	5385.0	10,000	3:10:40 B
5386.0	189,376	333,623	5385.0	5,000	3:10:40 B
5385.5	68,307	144,247	5385.0	10,000	3:10:40 B
5385.0	75,940	75,940	5385.0	250	3:10:40 B
5384.5 ↓			5385.0	20	3:10:40 B
⌚ 5392.13 / 5392.00 ⏸ ⏹ ⏺ ⏻			5385.0	50	3:10:40 B
			5385.0	120	3:10:40 B
			5385.0	100	3:10:40 B
			5385.0	50	3:10:40 B
			5385.0	80	3:10:40 B
			5385.0	200	3:10:40 B
			5385.0	80	3:10:40 B
			5385.0	100	3:10:40 B
			5385.0	100	3:10:40 B
			5385.0	300	3:10:40 B
			5385.0	1,000	3:10:40 B
			5385.0	500	3:10:40 B
			5385.0	10,000	3:10:40 B



Better to wait in this situation: this would NOT have been a good time to limit sell and enter short as the demand run continued higher. Take a look at the size of the bidding in the limit order book, the lack of offering and the current aggression of the market buyers. It may be best to either wait for this demand run to die out (on extremely high or extremely low volatility) or to wait for a transition into inactive equilibrium to more safely limit sell.

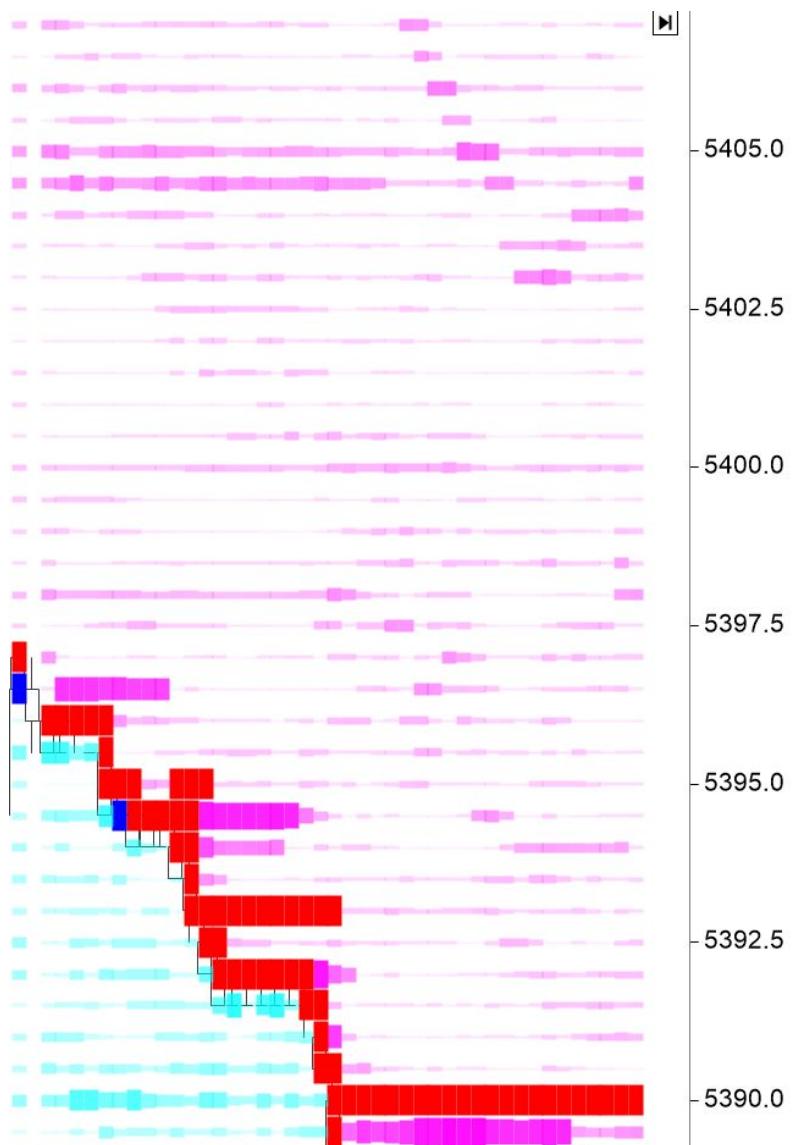


The vertical line above denotes where the first picture was taken. Price continued to rise and, in the new picture above, is in a period of inactive equilibrium. The sellers have finally fought back, resulting in price's inactive equilibrium shape, and making it a better time to fill the limit sell order if you are still bearish.

4. Executing a trade at the best possible price using advanced order flow:

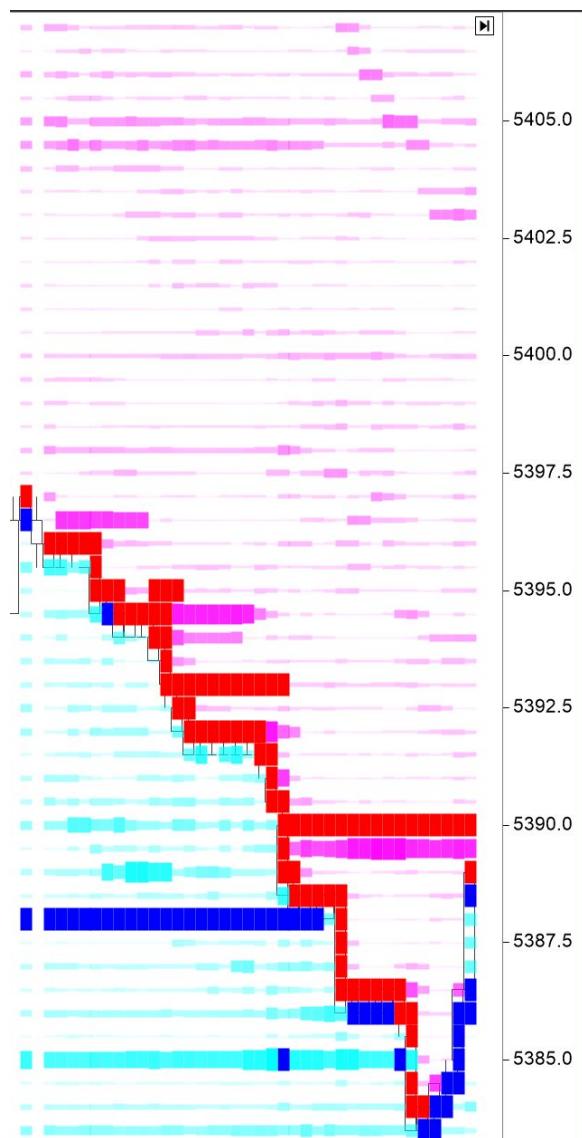
You are looking to go long. Using the advanced order flow below and your knowledge of supply/demand runs, decide whether it is more profitable to set a limit buy at the current best bid (5389) or wait to enter long at a lower price.



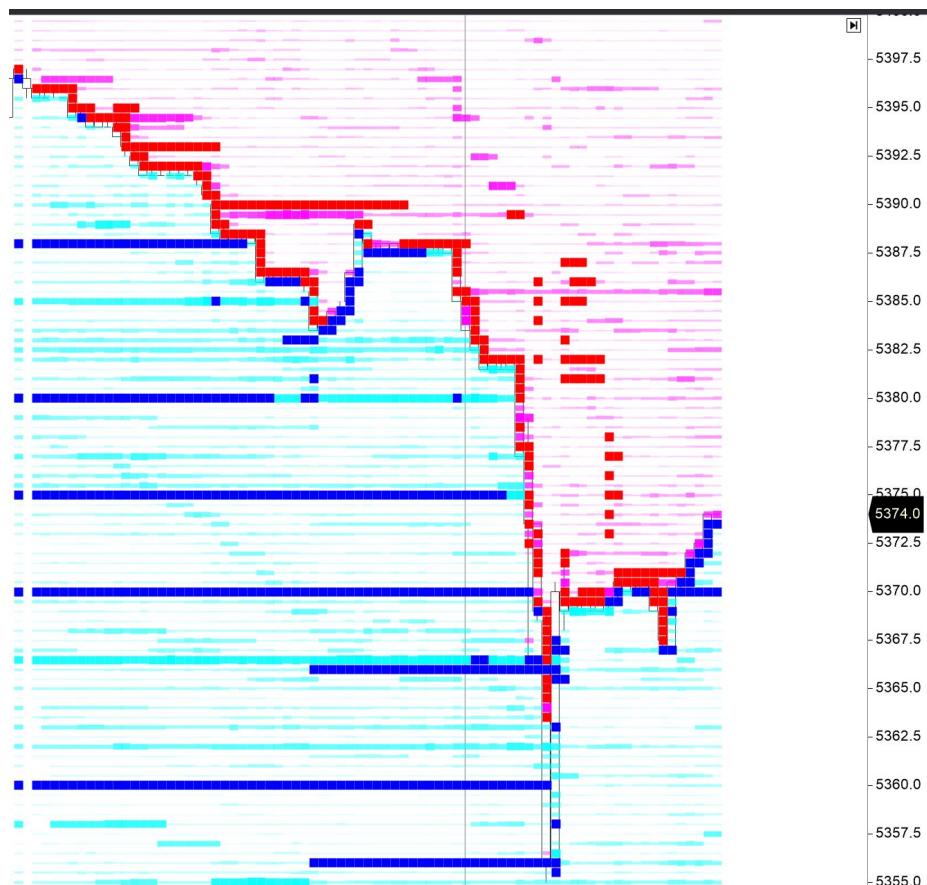


Better to wait in this situation: this would NOT have been a good time to limit buy and enter long as the supply run continued lower. Within the current steady supply run lower, there is a consistent large offer that pushes price lower (red transparent candles). Additionally, some of the larger offers remained set, such as the offer at 5390, even when it wasn't the best offer. There is also a lack of bidding that will make it more likely that price would go even lower.

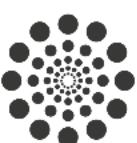
Now take a look at the price snapshot a few minutes later, there is a current demand run. Imagine that you have switched your analysis and are now looking to go short with a limit sell entry. Would this be a good idea? Do you believe the downtrend will continue lower and should we fill our offer in this demand run?



This would have been a good time to limit sell and enter short. The demand run ran out of steam and price continued far lower, to a low at 5355. One indication of the weakened demand at the point in time that was shown was the lack of bidding that occurred on the upmove from 5386 up to 5389 (there is white space in that candlestick, meaning that the best bid was not that large). However, you may notice the large bid walls that were present at lower prices such as 5375, 5370, 5366, 5360 and 5356. All of these bid walls were cut through by price as the supply run continued lower. Take a look at how strong that supply run was - there was very little white space in the transparent candles as the best offer was quite large on the majority of the supply run.



When you see a strong supply run where the best offer is consistently quite large, but there are large bids that are located below price: price tends to fall in that situation as the large limit sell orders near price can have more of an effect on price's movement than the large orders that were placed farther away from price.



Likewise, when you see a strong demand run where the best bid is consistently quite large, but there are large offers that are located above price: price tends to rise as the large limit buy orders near price tend to have more of an effect on the price's movement than the large orders that were placed farther away from price.

Supply/demand runs are an incredibly important facet of order flow analysis that can help scalpers profit as well as traders of all timeframes who would like to place limit orders. Whether you are looking at a price action and volume chart or a heatmap, using your knowledge of how price moves in the micro short-term can help you pinpoint great entries and exits. The more that you focus on these types of market structures, the more you will be using limit orders instead of market orders, saving on fees as well.

10.3 Order Depth Practice

Studying order depth can allow you to gauge the supply/demand of the market in the short-term, medium-term, and long-term. Locating these order depth imbalances can help you buy before others buy and sell before others sell.

Recall the basic strategy of interpreting order depth:

Price tends to rise on excess demand (bids > offers) and fall on excess supply (offers > bids).

Looking for confluence among order depth indicators is vital to getting a strong gauge of the actual supply/demand of the market that you are trading.

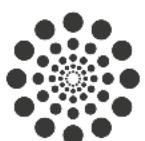
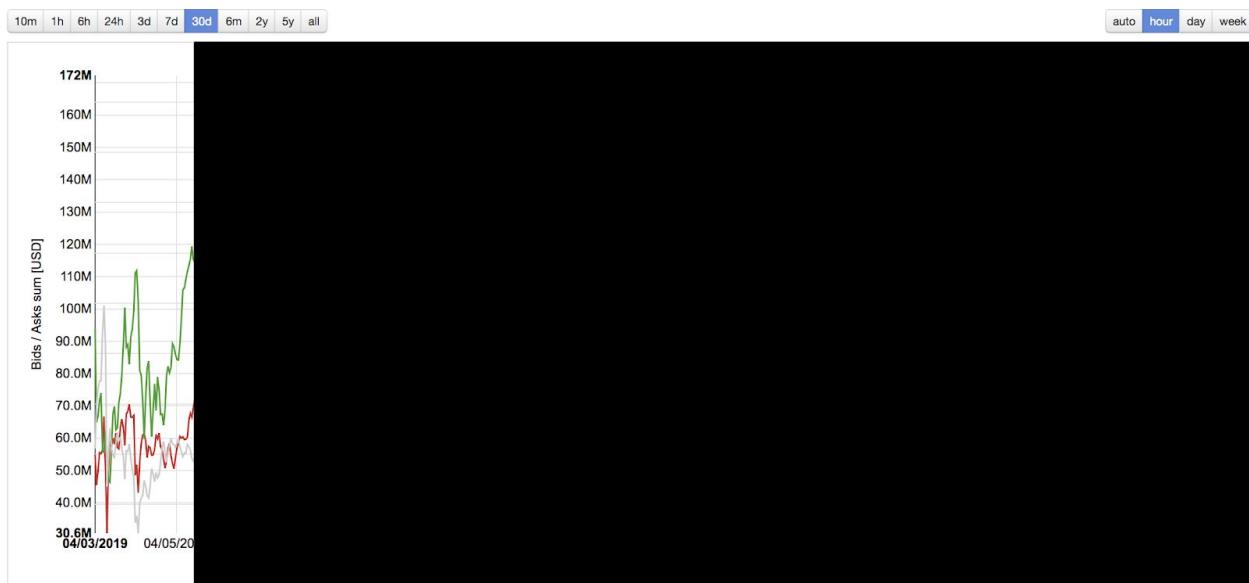
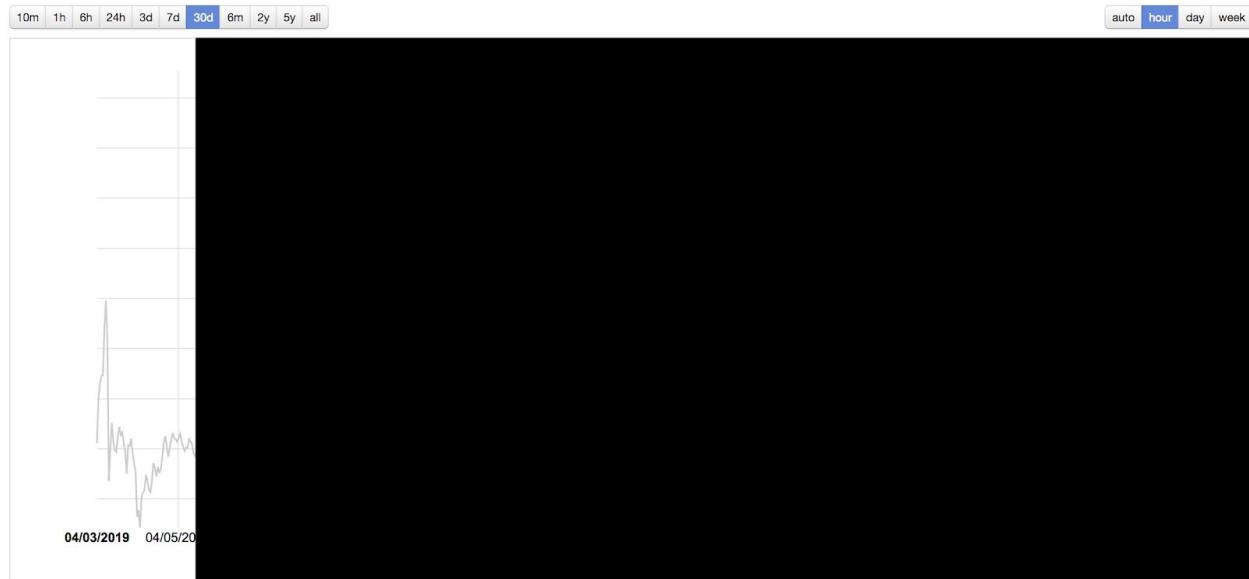
Looking for additional confluence outside of order depth (such as looking at market aggression with stacked imbalances, deltas, etc.) can give an even better picture about price's likelihood to move with or against an order depth imbalance.

1. Locating a significant order depth imbalance using BAS higher timeframe:

Take a look at the two charts below. The first is of just the BTC price. The second is of the price of BTC with the 5% range BAS: bids and offers. Analyze both the dominant order depth (if there is excess demand or excess supply) and the significance of



the order depth (how large that order depth imbalance is). Would you be more inclined to buy or sell as a result at the present price?



There is a significant amount of excess demand. This would be a good time to enter long and/or to exit shorts. The bidding is at 120 million contracts in the most recent portion of the BAS and the offering is only at 70 million contracts. Price continued to rise from around a price of 5000 in the initial picture to a high at 5330.



2. Locating a significant order depth imbalance using BAS lower timeframe:

Take a look at the chart below. This is BTC on a 0.5% range BAS: bids and offers. Analyze the dominant order depth (if there is excess demand or excess supply) and the significance of the order depth (how large the order depth imbalance is). Would you be more inclined to buy or sell as a result at the present price?

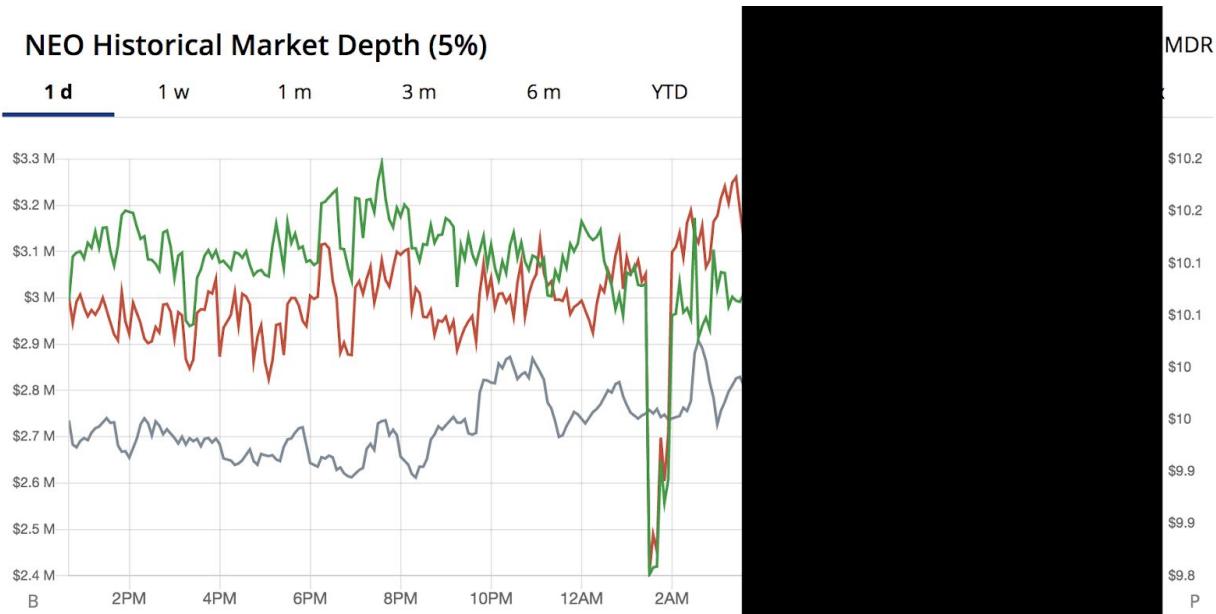


There is a significant amount of excess supply. This would be a good time to enter short and/or to exit longs. Price fell from the period of consolidation and moved lower on the strong selling pressure.



3. Locating a significant order depth imbalance using combined MDR lower timeframe:

Take a look at the NEO MDR chart below. Analyze the dominant order depth (if there is excess demand or excess supply) and the significance of the order depth (how large the order depth imbalance is). Would you be more inclined to buy or sell as a result at the present price?



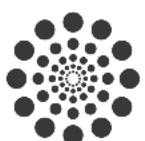
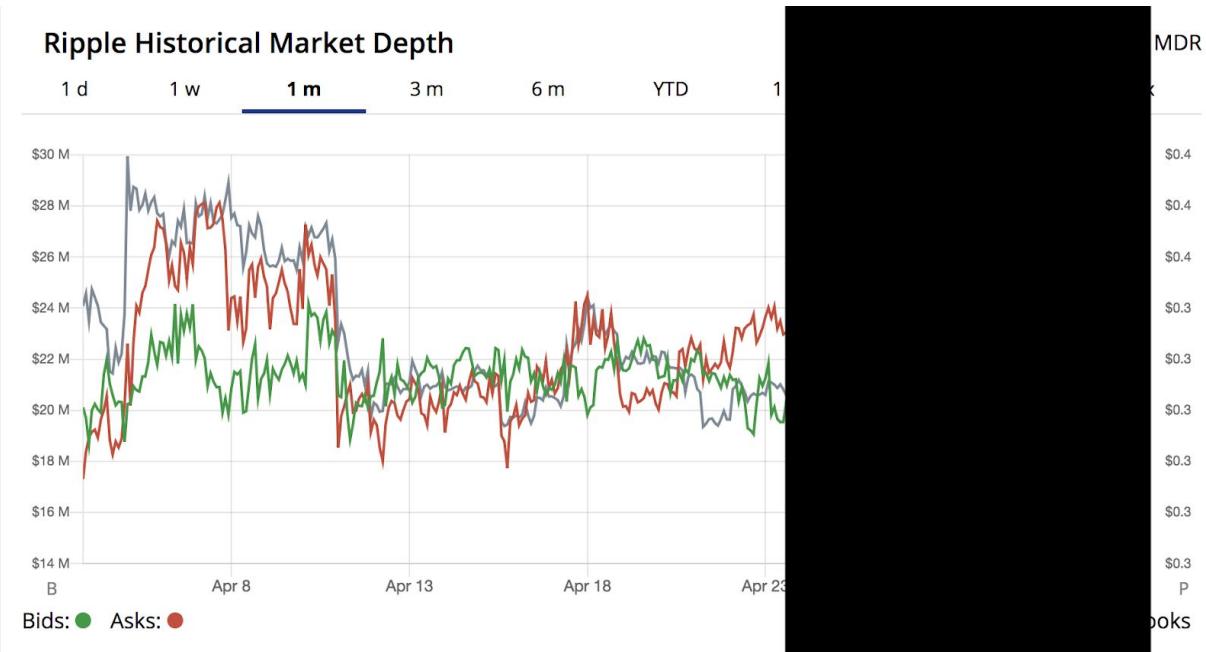
There is excess supply. The bids were dominant over the offers until the recent price formation and the offers flipped above the bids. Price is likely to fall. Price fell first and then rose after the bids overtook the offers.



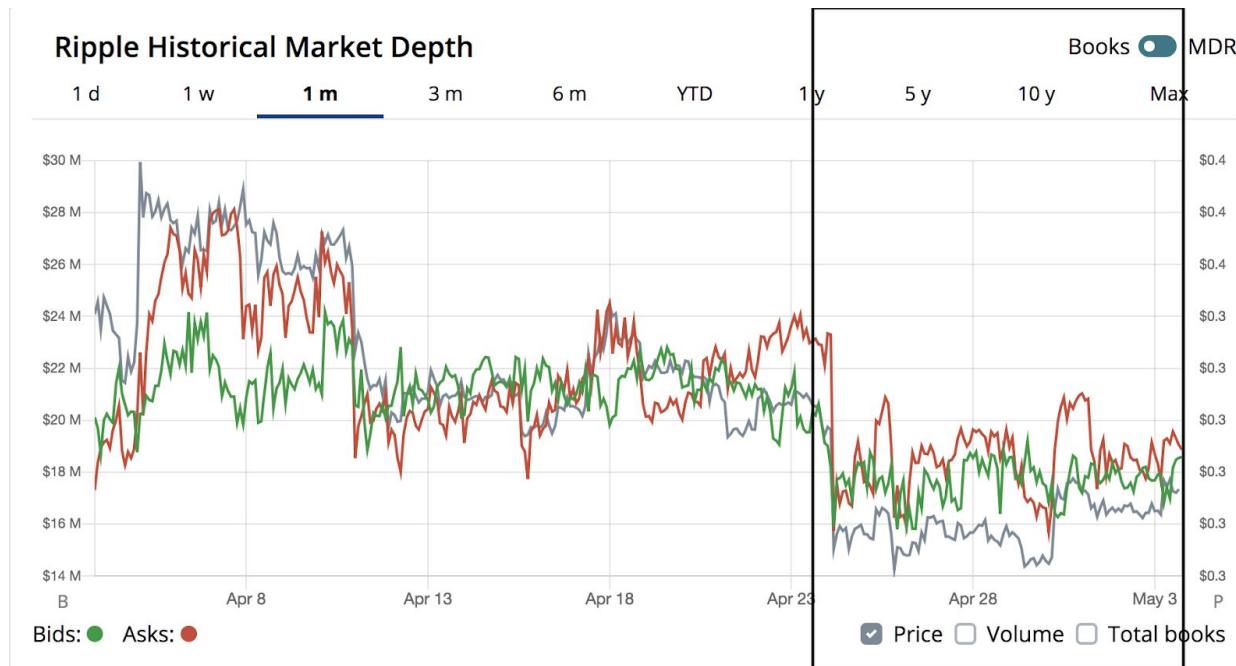
- Locating a significant order depth imbalance using the MDR higher timeframe:

Take a look at the XRP MDR chart below. Analyze the dominant order depth (if there is excess demand or excess supply) and the significance of the order depth (how large the order depth imbalance is).





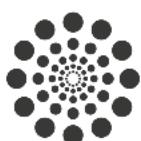
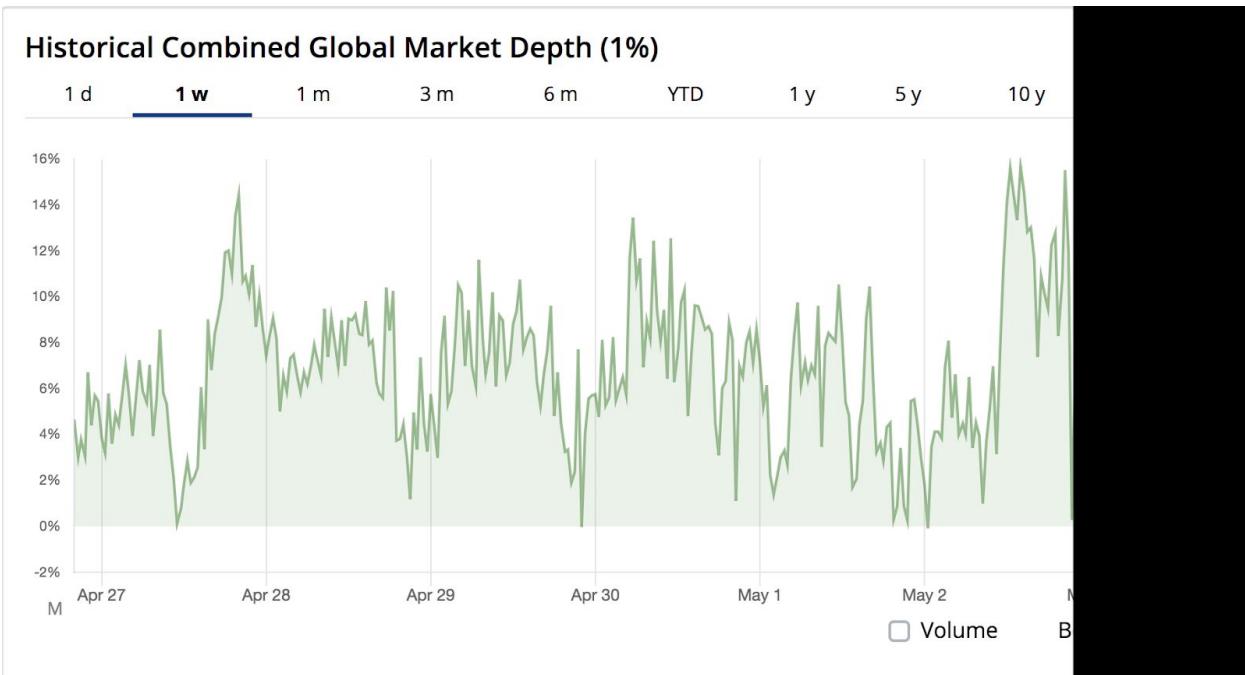
There is excess supply. Previously (on the far left side of the chart above), price rapidly moved higher before moving lower as the offers held dominant over the bids. Later, price consolidated for quite some time and then the offers recently emerged dominant over the bids once again. Price is likely to continue to fall.



5. Locating a buying opportunity using a threshold strategy on the combined global MDR:

Take a look at the Global MDR chart below. Which global MDR level would make for a strong buy threshold?





The 14% to 16% Global MDR range contains the two previous MDR highs, to which the BTC price rose each time this threshold was reached. When the MDR reached this value again, price rose 1.5% in the short-term (as indicated by the circle in the MDR chart and the arrow in the price chart below).



10.4 Spoofing Detection Practice

A drawback of following an order depth strategy is the use of spoofing by large traders and HFT's to dupe other traders into buying/selling on non-genuine supply/demand.

Being able to detect spoofing plays using multiple methods can allow you to not only protect yourself from getting spoofed, but even allow you to take advantage of the spooper's intentions as well.

Recall the three stage of a spoofing play:

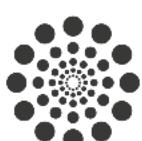
The Build-up: The spooper places limit order(s) to stack the market in one direction.

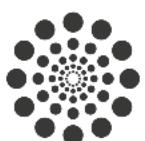
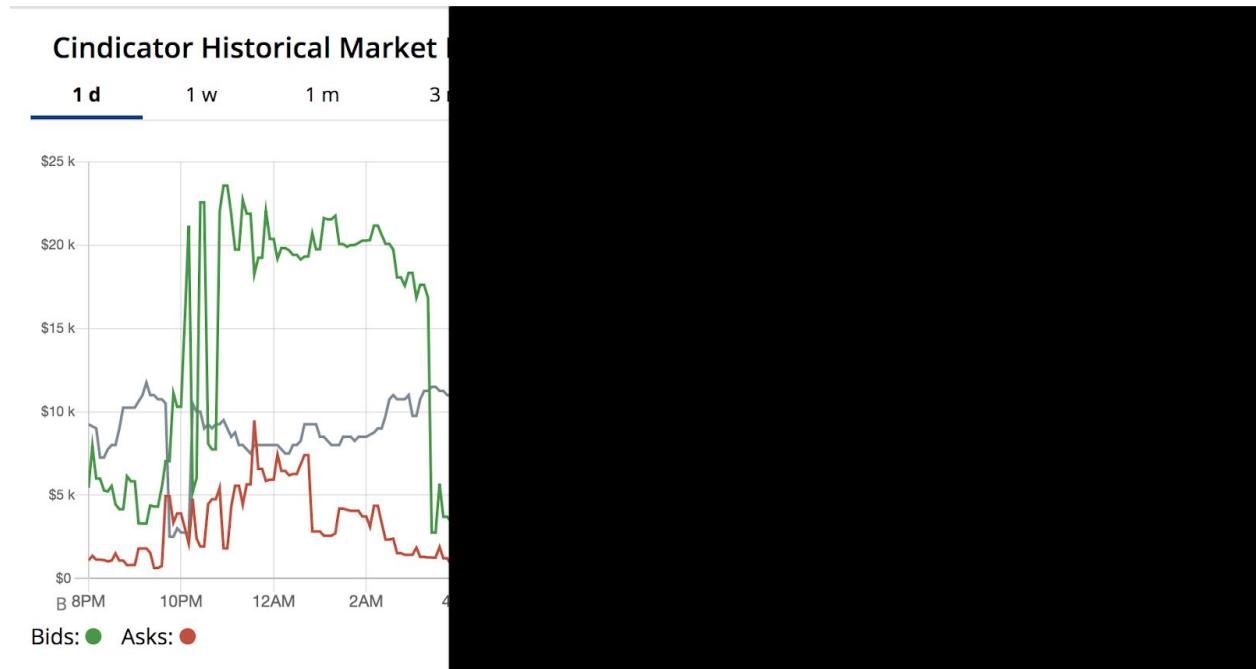
Cancellation: The spooper removes his fake order flow from the order book.

The Sweep: The spooper sweeps the generated liquidity with a market order.

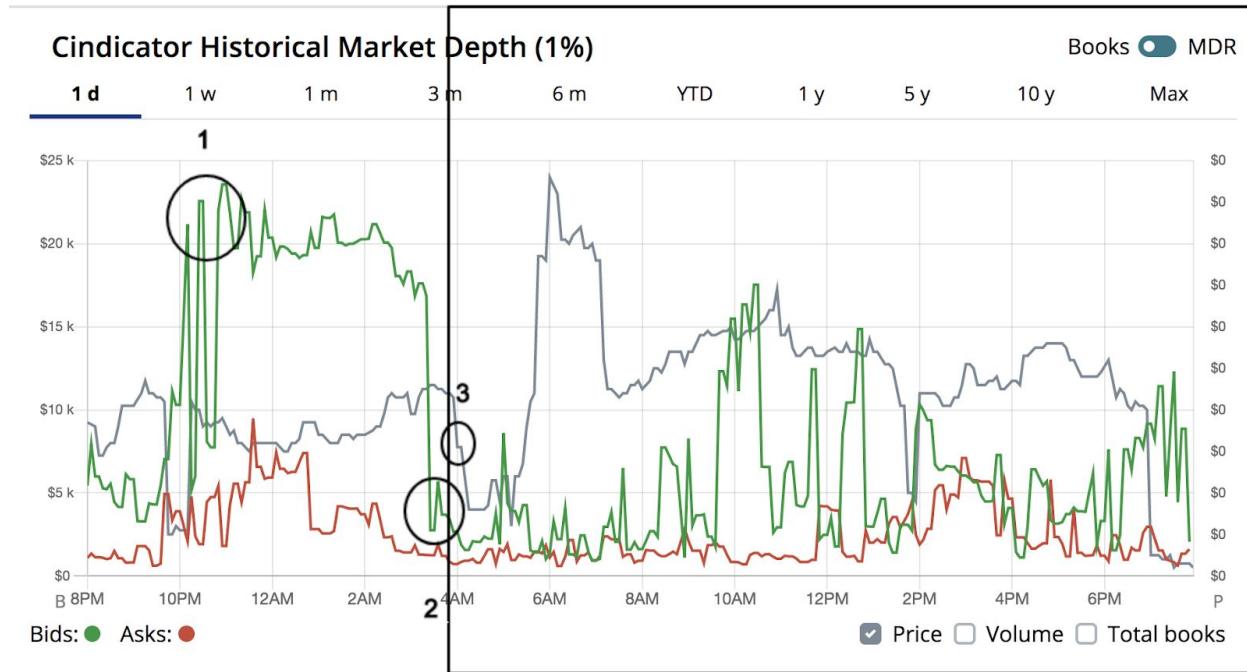
1. Locating a spoofing play using the 1% MDR:

Take a look at the bid movement in the 1% CVC MDR chart. Identify the three stages of the spoof and then determine whether price is more likely to rise or fall.



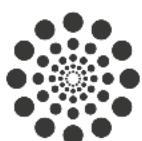


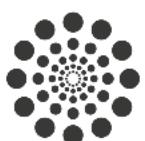
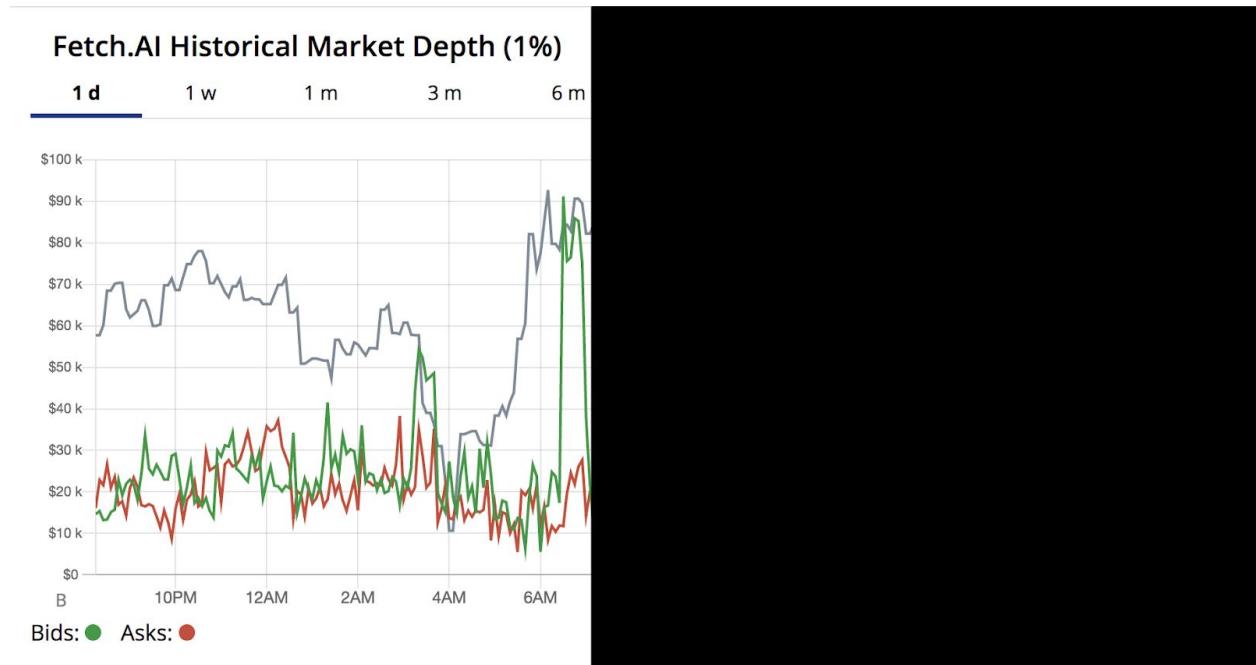
The first circle shows the time in which the bids were placed. The second circle shows where the bidding was cancelled. The third circle shows where price fell on heavy market selling. **Price is more likely to fall (and it did).**



2. Locating a spoofing play using the 1% MDR:

Take a look at the bid movement on the 1% FET MDR chart. Is this large bidding genuine demand or a spoof play? What is likely to occur to FET's price as a result?



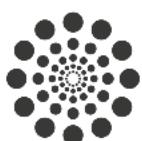


This was likely a spoof play. A large bid was placed for liquidity generation - to entice potential buyers to buy the altcoin FET, so that a spoofe would be able to sell their allotted position. Price fell.



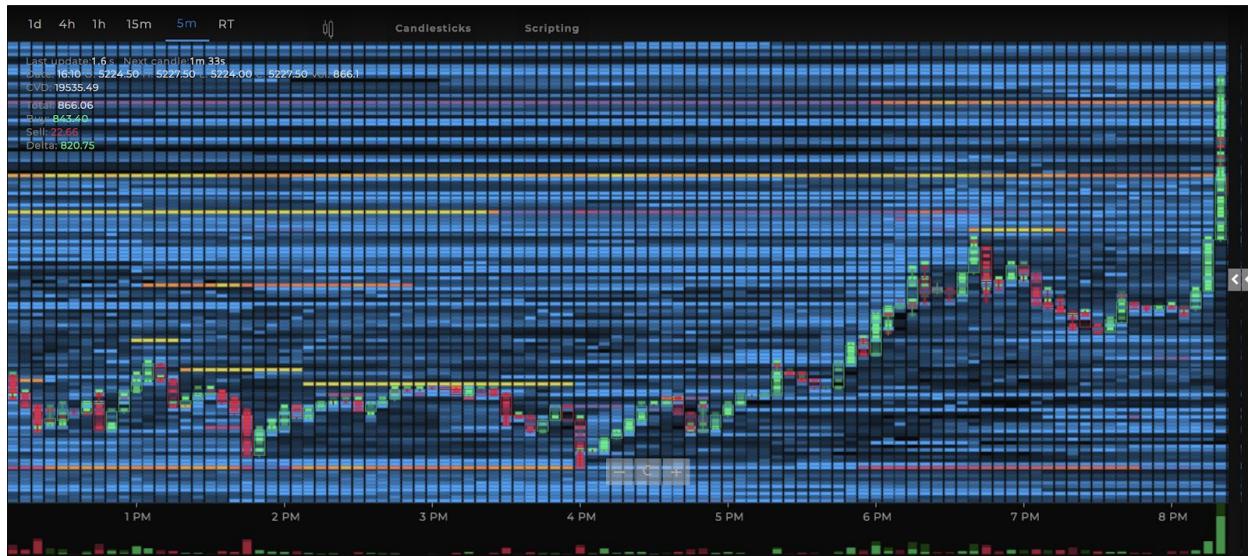
3. Locating a spoofing play using the heatmap:

Take a look at the offer movement on the chart below (yellow limit order circled in white). Is this a spoof play? If so, how would you trade it?





This was likely a spoof play. A large offer was placed and price fell. After the offer was cancelled, price consolidated and then rose.



10.5 Support/Resistance from the LOB Practice

You can use the large resting orders in the limit order book as support/resistance levels. Recall the ways in which we can use large limit orders to our advantage:

By placing our limit entry or limit exit orders just in front of another large limit order. This would be one tick below a large offer or one tick above a large bid.

By placing a stop loss just beyond a large limit order. This would be one tick above a large offer (stop loss for a short) or one tick below a large bid (stop loss for a long).

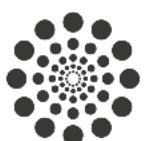
Large limit orders that have been filled showcase a strength in the trend. If price rapidly moves through a large offer and price does not make a wick high, this is bullish. If price rapidly moves through a large bid and price does not make a wick low, this is bearish.

1. Using the LOB to locate large limit walls:



Imagine that you have gone long on ADABTC on Binance. Using large limit orders to your advantage, at what price would you set your take profit? At what price would you set your stop loss?

Price(BTC)	Amount(ADA)	Total(BTC)
0.00001236	443,485	5.48147460
0.00001235	47,691	0.58898385
0.00001234	200,444	2.47347896
0.00001233	65,487	0.80745471
0.00001232	113,132	1.39378624
0.00001231	225,131	2.77136261
0.00001230	114,139	1.40390970
0.00001229	109,350	1.34391150
0.00001228	59,070	0.72537960
0.00001227 ↑ \$0.071448		■■■
0.00001227	162	0.00198774
0.00001226	125,106	1.53379956
0.00001225	225,787	2.76589075
0.00001224	80,980	0.99119520
0.00001223	155,755	1.90488365
0.00001222	156,016	1.90651552
0.00001221	114,803	1.40174463
0.00001220	519,275	6.33515500
0.00001219	67.376	0.82131344



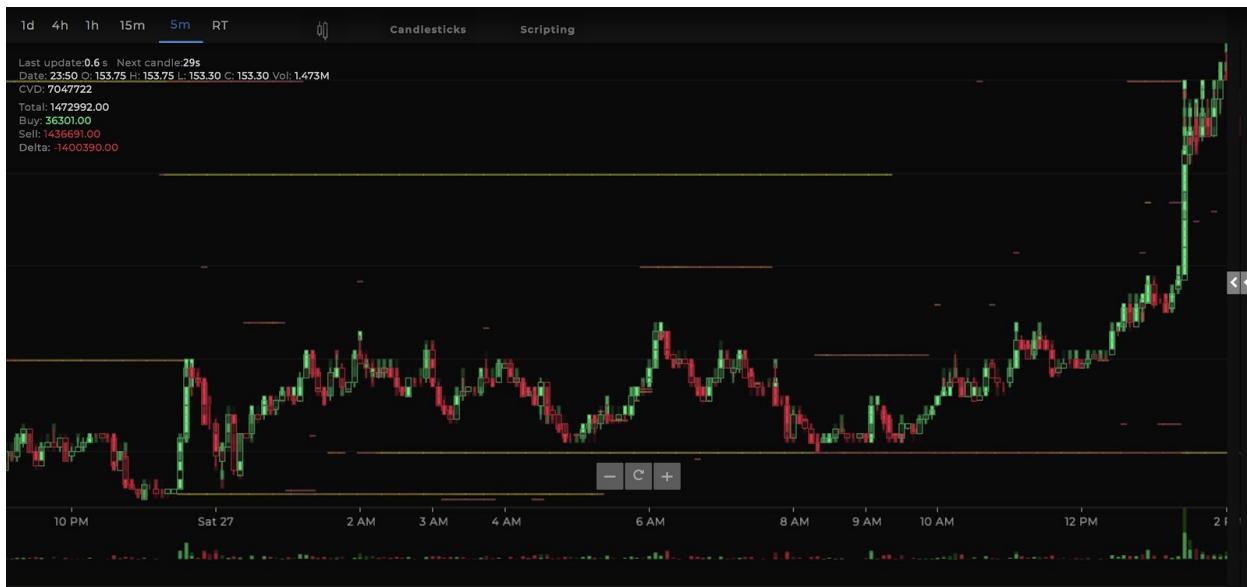
Placing your take profit at .00001235, just one tick below the large offer wall at .00001236, would allow you to sell at a resistance level. **Placing your stop loss at .00001219**, just one tick below the large limit order at .00001220, would allow your position to be protected by the large bidding depth present at that price.

2. Using the LOB heatmap to gauge the strength of a large limit order:

A large bid order was recently tested by price (white circle denotes where this occurred). Does this look like a strong price reaction or is price likely to move beyond this wall and lower?

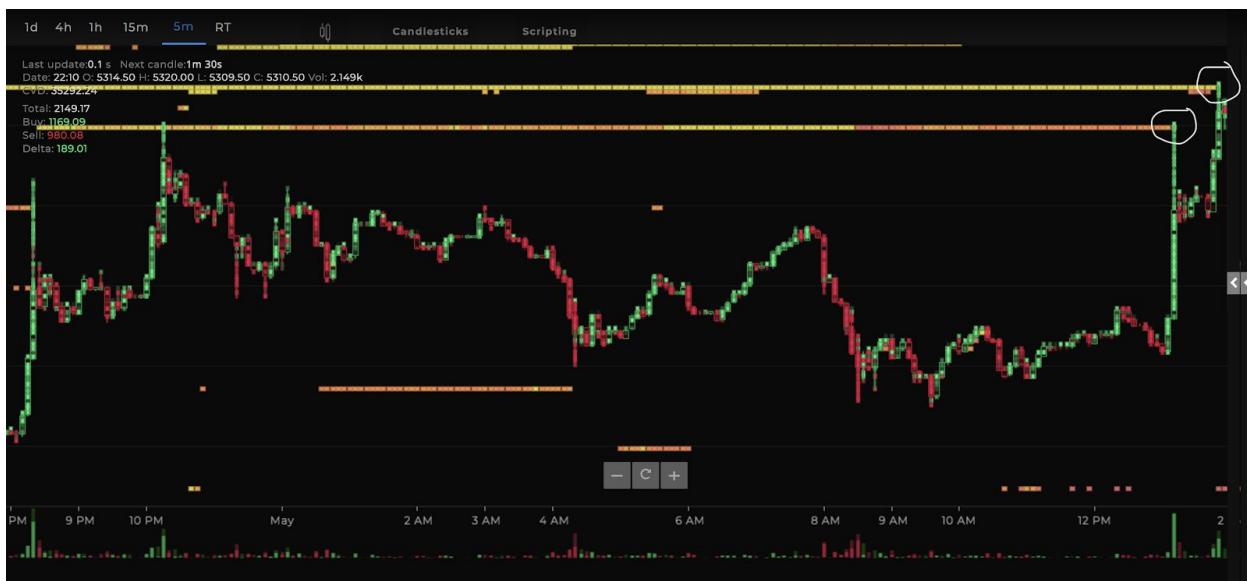


This was a strong price reaction. The large limit order held strong (although it did dwindle in volume) and demand pressed price higher.



3. Using the LOB heatmap to gauge the strength of a large limit order:

Two large offer orders were recently executed by price (white circles denote where this occurred). Judging the manner in which price moved through these walls, will price continue to rise or reverse and fall?

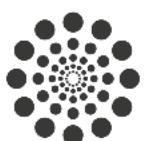


This was a strong price reaction. Both times that price moved through the large offer walls, price made a wick high. This was late-stage buying and price fell as the buyers became exhausted.



4. Gauging ease of movement from locating a lack of large limit orders:

Take a look at the LOB of AE below. Will price likely have an easier time moving higher or lower?



Price(BTC) Amount(AE) Total(BTC)

Price(BTC)	Amount(AE)	Total(BTC)
0.0000860	922.41	0.07932726
0.0000859	669.24	0.05748772
0.0000858	129.15	0.01108107
0.0000857	87.65	0.00751161
0.0000856	301.05	0.02576988
0.0000855	5,945.93	0.50837702
0.0000854	1,292.03	0.11033936
0.0000853	686.35	0.05854566
0.0000852	93.38	0.00795598
0.0000851 \$0.500219		■■■
0.0000847	284.77	0.02412002
0.0000846	2,316.41	0.19596829
0.0000845	2,687.97	0.22713346
0.0000844	10,014.88	0.84525587
0.0000843	11,847.75	0.99876533
0.0000842	18,469.70	1.55514874
0.0000841	5,929.94	0.49870795
0.0000840	10,686.84	0.89769456
0.0000839	173.12	0.01452477



Price will have an easier time moving higher. The local bid depth is far larger than the local offer depth.

5. Gauging ease of movement from the heatmap:

Take a look at the heatmap below. Will price have an easier time moving higher or lower?



Price will have an easier time moving higher. There were not many offers above price.

10.6 Application of LOB Strategy Practice

Remember to gauge price's movements back to its order depth/order flow and also to pay attention to which price patterns tended to lead to higher probability trading opportunities.

Recall the key elements from the chapter:

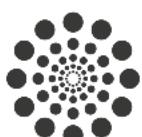
Consolidation is typically most revealing of the present supply/demand of the market and order depth patterns tend to work well with this market state. Use order depth indicators such as the **combined MDR, BAS, and the combined global MDR**.

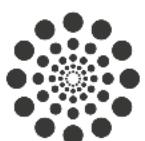
Trending markets can make it tougher to gauge the supply/demand of the market. Using an order flow analysis may work better than using order depth patterns. This includes looking at **market aggression, heatmaps, and the effect of the best bid versus the best offer**.

The two primary types of traders are **position-based traders** who establish positions when the market provides a high probability trading opportunity and **order-based traders** who establish positions by placing limit orders in likely reversal areas and placing stop orders in continuation areas.

1. Determining a state of consolidation versus a trend:

You are looking at ETHUSD on the 1-minute timeframe. Within the portion highlighted by the rectangle, is this a state of consolidation or a trend? As a result, should we pay more attention to order depth or order flow?

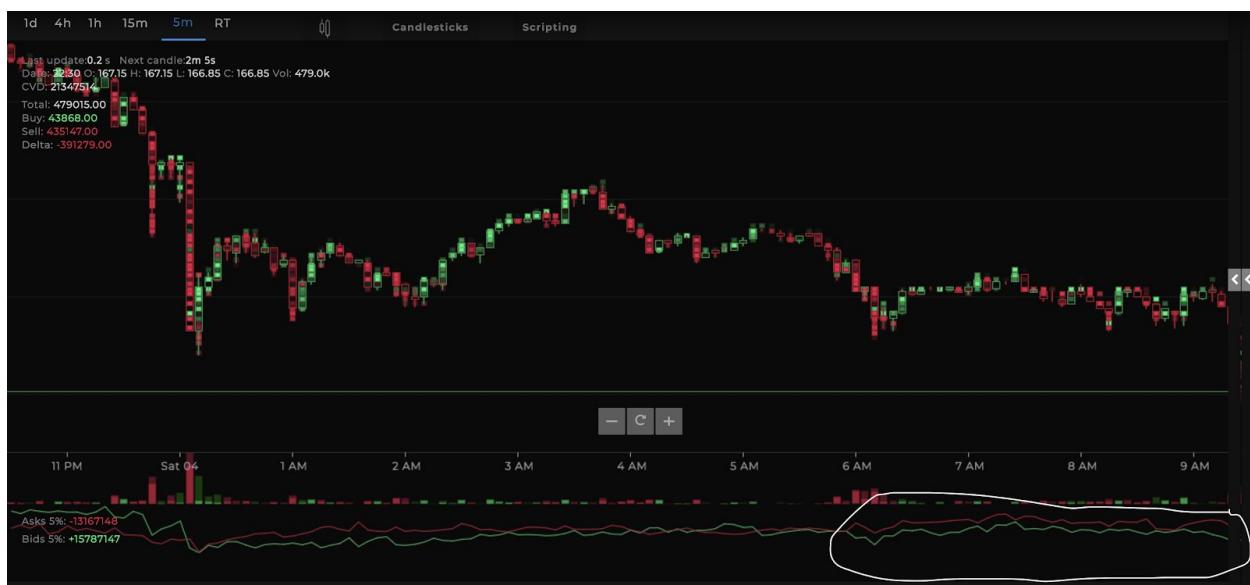




This is a state of **consolidation** and we should be leaning toward an **order depth analysis** when determining which way price will move in the near-future. However, you could also look at order flow metrics such as stacked imbalances to identify the buyer vs sellers aggression.

2. Using order depth to predict a short-term price movement:

[This is a continuation from the first question.] Now, looking at the 5% BAS of ETHUSD, should you enter short or enter long?

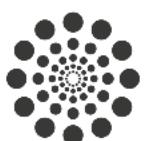


Looking at the order depth, you should **enter short** during this stage of consolidation. Price fell on the bearish order depth.



3. Determining a state of consolidation versus a trend:

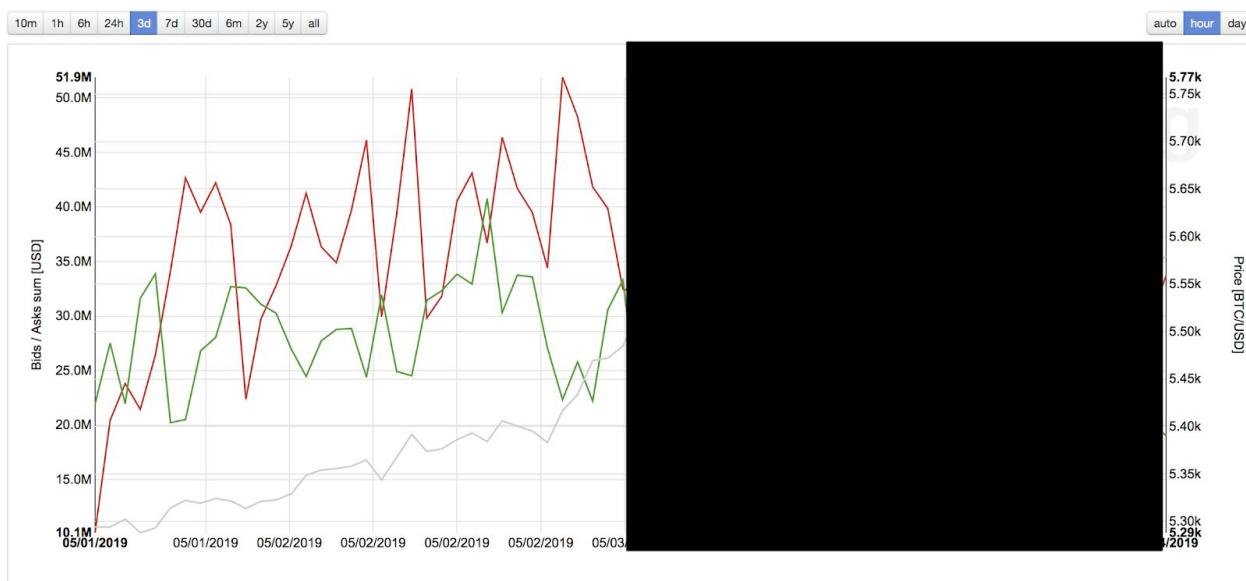
Looking at the chart of XBTUSD below, is the market currently in an uptrend or is the market likely to stall and consolidate? Based on that market state, should we look more at order flow or order depth?



The market was in an **uptrend**, although there was a rapid sell-off that occurred. We should pay more attention to **order flow**, with an analysis of the current market aggression.

4. Using order depth to predict price's future movement:

[This is a continuation from the previous question.] Now, looking at the data below, should you enter short to trade against the trend or enter long with the present trend? Although order flow tends to work better than order depth during a trend, take a look at the 1% BAS for a visual.



Now, look at the simple chart of just the market delta and determine whether this market is likely to continue higher or move lower.

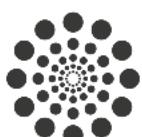




The market remained in an uptrend. Although order depth was repeatedly bearish as can be seen from the rise in the 1% offers in the BAS throughout the uptrend, the delta showed that the market buyers still dominated over the market sellers. The rapid sell-off at 6:41 with a negative delta was countered by an immediate string of market buying that carried the market higher.



In reality, this would have been a tough market to trade. Order depth and order flow were providing conflicting signals (tends to occur in strong trends) and there were



rapid price down spikes on negative deltas that could have easily misled some order flow traders who were solely studying the trend.

If you prefer studying order depth, it may best to wait for consolidation or low-volatility market patterns instead. You can wait for the market to consolidate and then establish a position based on an order depth imbalance (confluence between multiple order depth indicators would be necessary). Also, you can look to exit the coin when price returns to a period of consolidation and checking present order depth.

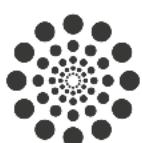
If you prefer studying order flow, trading the trend and only exiting on a major change in the aggression of the market or on a heatmap pattern may provide you with the best trading opportunities.

10.7 Advanced Order Flow Practice

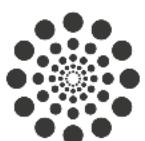
Advanced order flow can allow you to see the behind-the-scenes of the market. You can learn to analyze the market in a similar fashion to prop traders and fund traders.

1. Locating Supply/Demand Imbalances from the DOM:

Looking at the depth of market below, are the market buyers or market sellers more dominant? Recall how to analyze supply/demand imbalances from the chapter on advanced order flow.



MKT	PRICE	MKT
	160.95	
	160.90	
	160.85	5654
7649	160.80	
3564	160.75	
1213	160.70	1404
3370	160.65	500
4714	160.60	8000
2778	160.55	3205
7555	160.50	
	160.45	



Sellers: there is an imbalance in favor of the aggressive sellers. Using the best bid versus best offer ladder method, we can take a look at each imbalance:

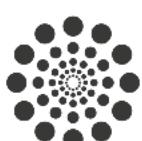
The best bid was at 160.8 and the best offer was a 160.85. There were 5654 contracts market bought at the offer and 7649 market sold at the bid. The sellers were more aggressive and price fell.

As price fell, there was a lack of market buying, as well as heavy market selling until the best offer was at 160.7 and the best bid was at 160.65. There were then 1404 contracts market bought on the best offer and 3370 contracts market sold at the best bid.

This imbalance led to price falling further. There were other imbalances that favored the sellers with only one imbalance that favored the buyers (when the bid was at 160.55 and had market selling of only 2778 contracts, whereas the offer was at 160.6 and had market buying of 8000 contracts). This imbalance favoring the buyers was not enough to carry price higher as the price of ETH continued to drop on the strong market selling.

2. Locating the Influx/Outflux of Supply/Demand from the DOM:

Take a look at the depth changes of the active bids and the active offers below. What type of DOM pattern do you see? Will price likely move higher or lower?



The column on the far right shows the changes in the offers.

161.10		110283	-11568
161.05		136762	-28207
161.00		198559	-33058
160.95	4500	46360	-21439

The column on the far left shows the changes in the bids.

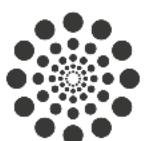
531924	697319		160.90
360711	354137	5000	160.85
370893	403275	1100	160.80
300739	119160		160.75



Offers are being removed, bids are being added - price is likely to rise. The change in offers shows that some of the local offers are being pulled, however the change in bids shows millions of contracts being added to local bid levels. Price continued to rise.

3. Locating delta extremes for a reversal:

Take a look at the price and delta chart below. Determine if this high volatility and positive delta is an extreme of the uptrend (likely to reverse) or represents strong demand from the buyers that will continue the uptrend.

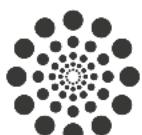


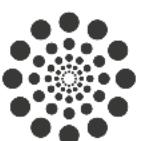
This was an extreme positive delta during the uptrend and price reversed lower. An average positive delta typically leads to bullish continuations and an average negative delta typically leads to bearish continuations. An extreme of either can reverse a trend. It may be helpful to also use other factors of confluence when reversal trading when noticing a delta extreme.



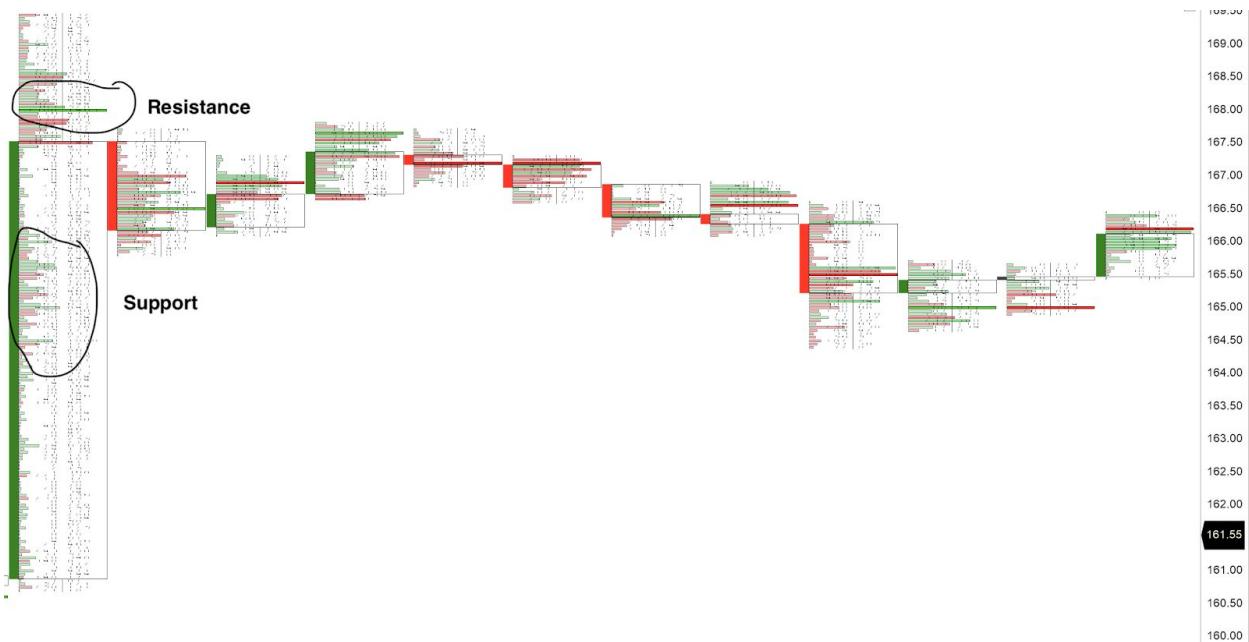
4. Using the candlestick volume profile for support/resistance:

Take a look at the volume profile shape of this high volatility 1-Hour ETHUSD candlestick. Which price level(s) will likely act as support/resistance?





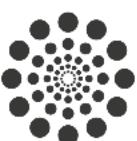
The price level of 168 acted as resistance, and the price levels from 164 to 166 acted as a zone of support. Price points of large volume typically act as support/resistance. The price level of 168 saw the largest volume (it was mostly market buying, as shown by the volume profile). In turn, price was unable to break the 168 level of resistance. However, price was able to move back down into the 164 to 166 support zone. Price then consolidated in that area and rose.

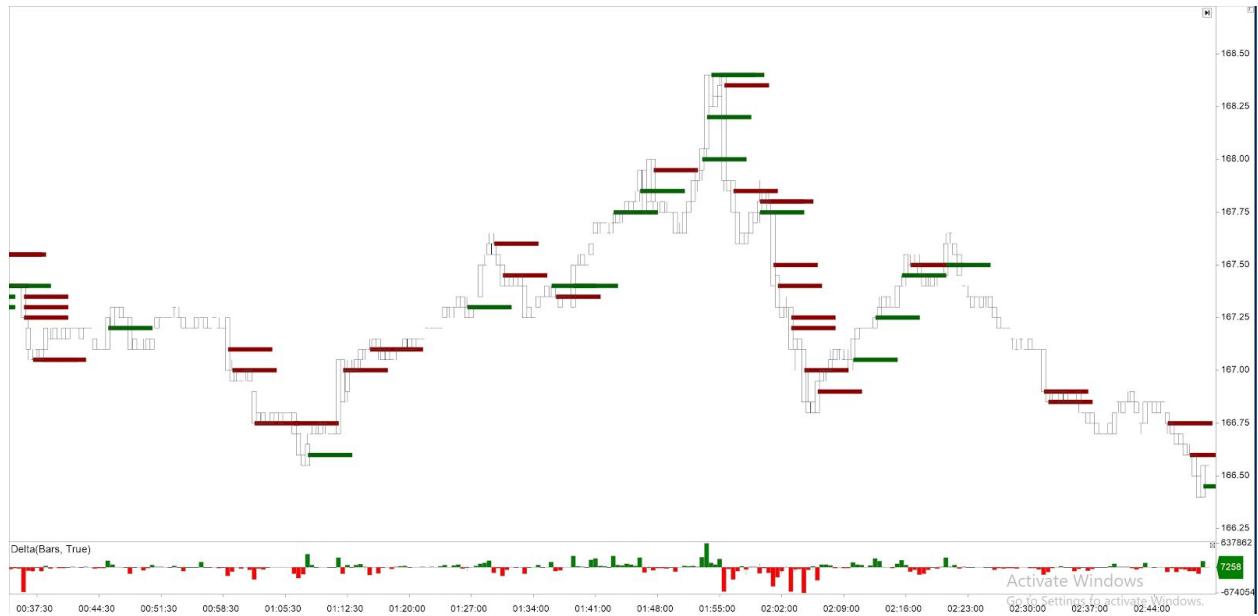


When looking at the candlestick volume profile on higher timeframes, marking up potential support/resistance areas can provide valuable limit order placement opportunities.

5. Using stacked imbalances to determine the dominant trend:

Take a look at the stacked imbalances on the 30-second chart of ETHUSD below. The coin was recently in an uptrend and then moved into a period of consolidation. Do the market buyers or the market sellers look more dominant? Is price more likely to move higher or lower as a result?





The market sellers are strong and price fell. There are multiple instances in this picture where price was moving higher alongside strong market selling. Additionally, each time price moved lower, the market sellers responded by aggressively selling, whereas the market buyers mostly stood clear. Shorting or exiting a long position would likely be the best course of action to take. In this scenario, you could wait for a demand run to fill your limit sell or try to sell immediately if you feel the need to exit a losing long position.

Price fell from a high at 168.35 to a low (picture below) of 160.9.



10.8 Heatmap Practice

The heatmap (also known as DOM levels) provides a historical look at the makeup of the order depth of the market. This type of information grants you access to the bid/offer movement that a simple price/volume chart or live order book would not be able to show.

Recall the basic strategy of interpreting the heatmap:

The heatmap provides a historical look at the depth size of the best bid and the best offer. You can use this to interpret how aggressively the bidders/offerors are pushing the price.

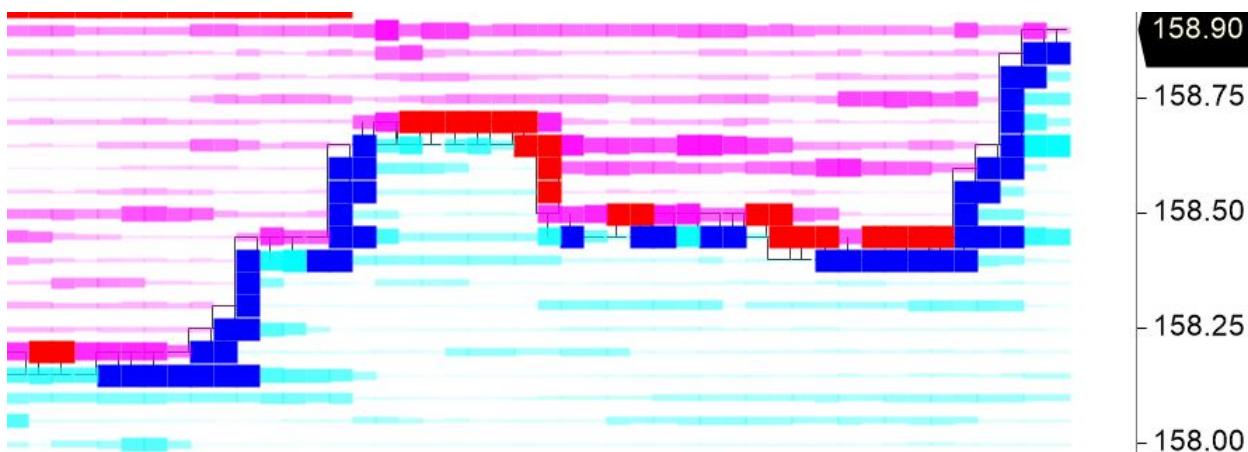


The heatmap provides data on the influx/outflux of supply/demand of a coin. You can use this data to identify a potentially better look at the actual supply/demand on a coin. You can also use this to identify spoofing plays.

The heatmap provides data on the present supply/demand of the market — how close certain limit orders are to price and the size of various limit orders.

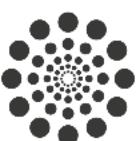
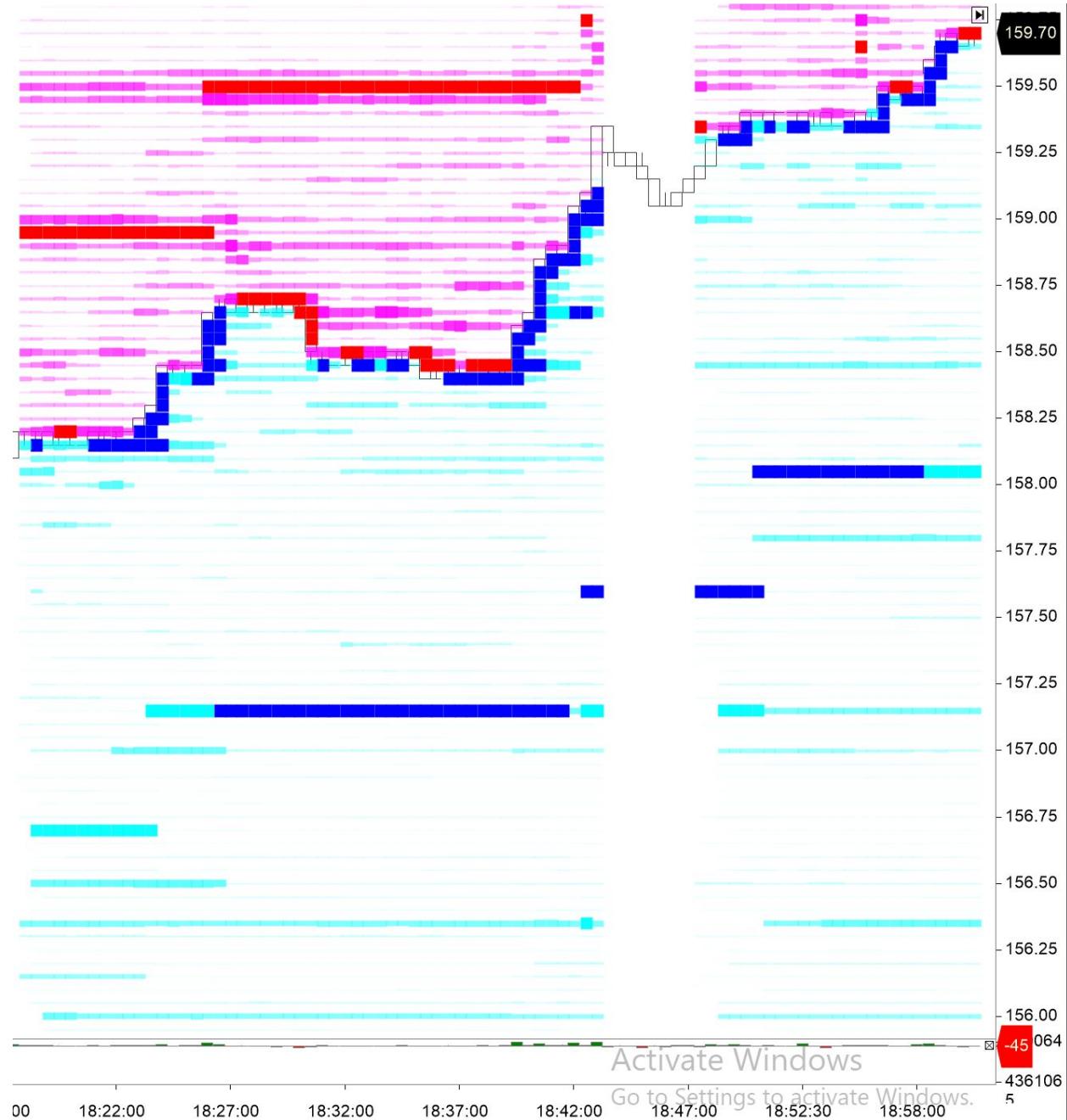
1. Dominance of best bid versus best offer:

Looking at the heatmap snapshot below of ETHUSD on the 30-second timeframe, focus on the volume size of the best bid and the best offer. Does the bidding during the demand run or the offering during the supply run seem more dominant?



The bidding is more dominant during this uptrend than the offering. From the present information, there is not much reason to believe that price will move lower. Even though the offers above price are slightly larger in volume than the bids below price, the consistently large best bid depth size is likely to continue to carry price higher.

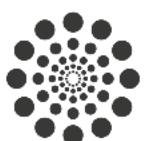
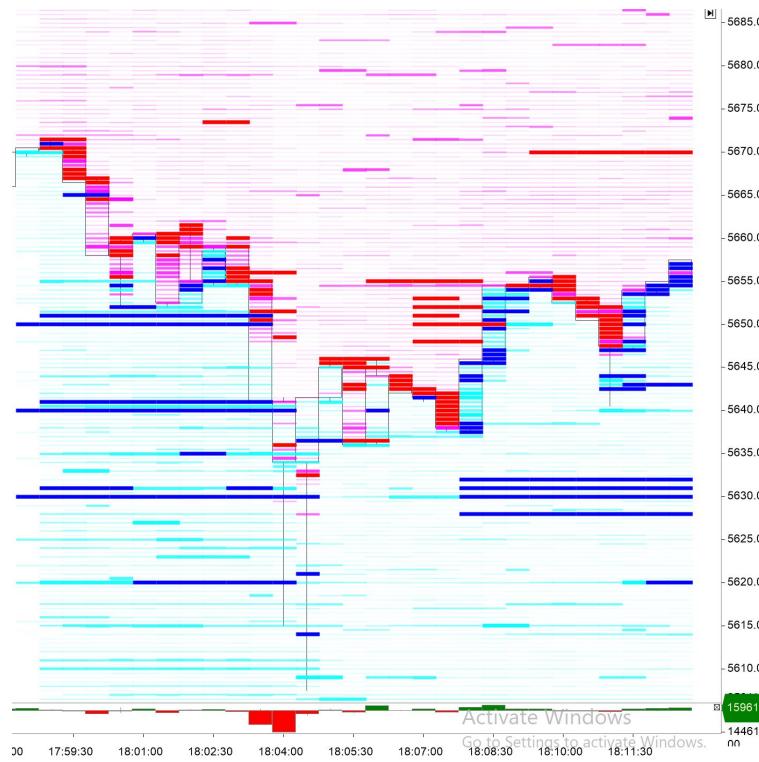
Price easily continued higher (the white space in between the heatmap was simply due to a temporary loss in connection).



It can be tough at times when analyzing a heatmap to decide to pay more attention to the movement of the best bid versus best offer, or to pay more attention to the overall heatmap. As a general rule, it is more important to focus on the bids and offers near price as they have the greatest effect on price's short-term movement. Finally, remember that *the trend is your friend* — trends tend to continue more often than reverse, despite what many traders may believe.

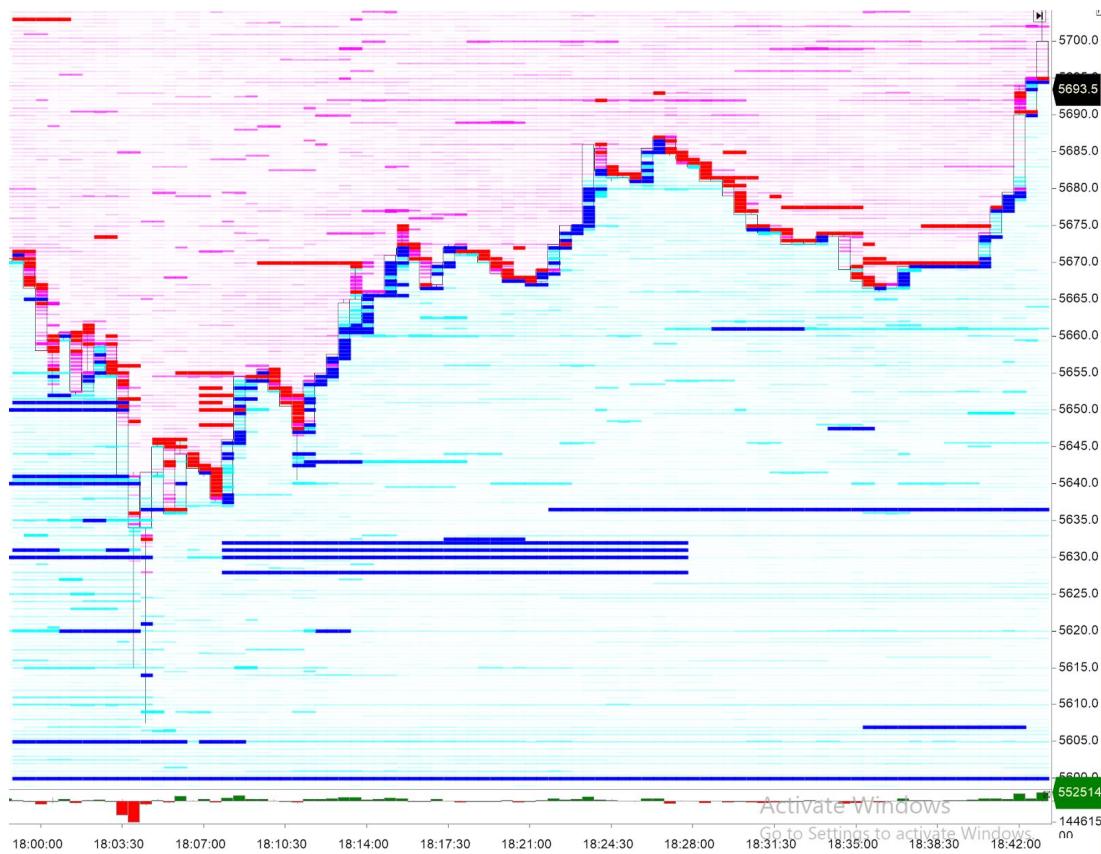
2. Using the influx/outflux of limit orders for supply/demand:

Looking at the heatmap snapshot below, do you see an increase or decrease in the supply of this market? Do you see an increase or decrease in the demand of this market? Is price likely to move higher or lower as a result?



Price fell on heavy market selling from the far left of the chart at 5670 to a low of 5605, where many bids were cut through. After price moved upward, **we see a decrease in supply and an increase in demand**. Look at the series of large bids placed from 5628 to 5632.5 and the bids placed around 5643. The bidders aggressively added limit buys as price increased, which is typically a bullish signal. Moreover, the offers from 5648 to 5655 have decreased either from being cancelled or have been filled by market buys.

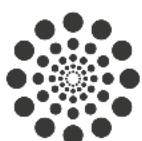
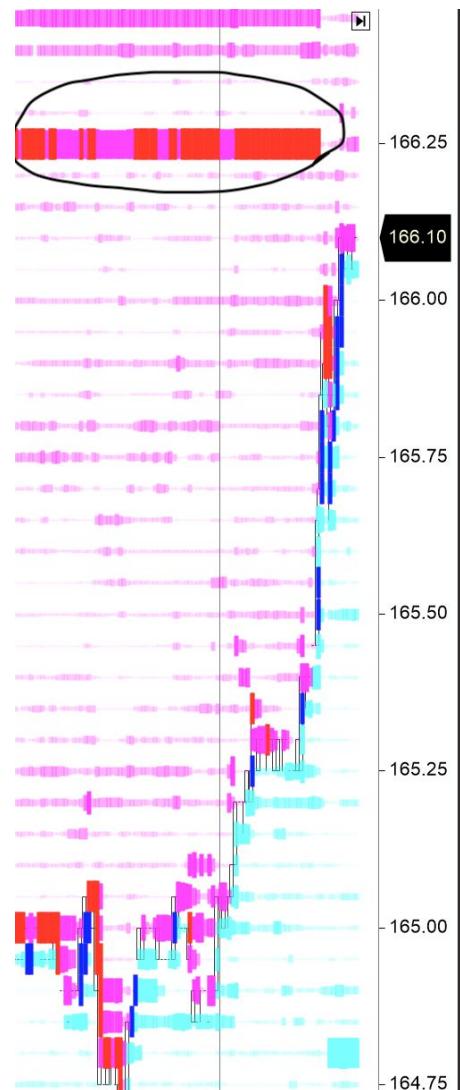
Price rose on the influx of demand and the outflux of supply.



3. The effect of the cancellation of a large limit order:

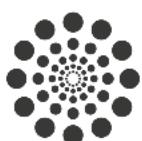
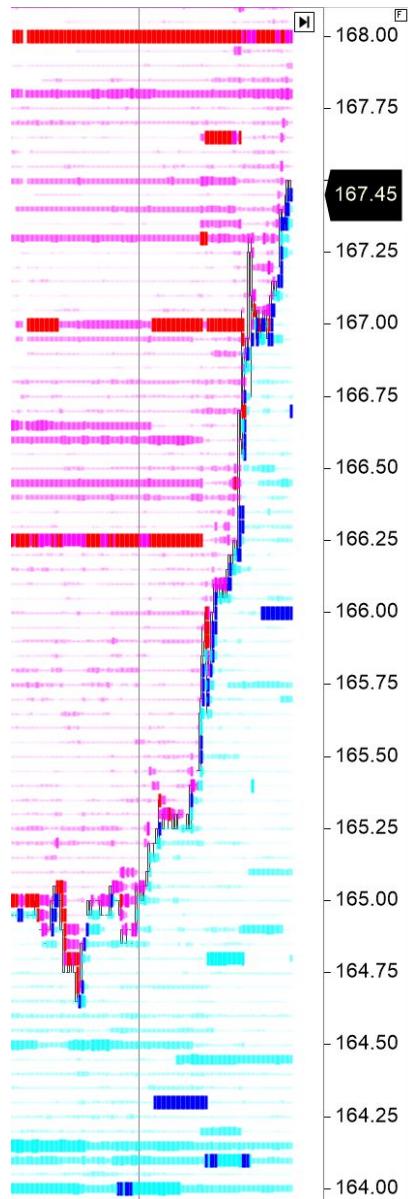
Price is rapidly rising and we see the large offer at 166.25 almost completely cancelled. Why did this occur and what effect may it have on price?





We don't know if this large offer was a failed spoof to attempt to keep price lower or if it was a genuine large limit sell order. Either way, **the order was likely cancelled as the aggression from the market buyers likely scared off potential offerors. This makes it easier for price to move higher.**

Price moves higher and we also see other cancellations of large offers as price rose.



4. Gauging the present supply/demand from the heatmap:

Looking at the large limit orders at the current price on the snapshot of the heatmap below, do you notice more supply or more demand? As a result, will price have an easier time falling or rising?



There is more present supply than there is demand and consequently price is likely to have an easier time **falling** as there are large limit sells just above price and little to no large limit buys below price.



10.9 Final Practice Exercises

The purpose of this final section is to provide you with practice exercises that you can use to sharpen your skills in order book, order depth, and order flow analysis. With all of these challenges, keep the capital you place in these trades very low relative to what you would normally place in a trade.

There will be one exercise included from each of the chapters on market strategy. Practice the exercises from the chapters that you find most important and that best fit your own trading style.

Order book Exercises

1. Predict the LOB

Purpose: Improve ability to predict micro short-term price moves by looking at the limit order book of an exchange.



Result: Increased awareness for when would be a good time to place a limit order or when a market order might be necessary.

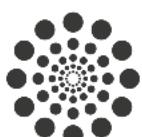
Take a look at a highly liquid order book (such as ETHUSD on Bitmex) and predict if price will be higher or lower after one minute. To do this, grab a stopwatch and watch the limit order book. After a minute is up, predict whether price will be higher or lower after the next minute. Once you make your prediction, start the timer and see if you were correct at the end of that minute. Continue to do these two minute intervals, with one minute spent actively watching the order book and the next minute making a prediction and checking to see if you were correct. For example, if the best bid for ETHUSD is 166.3 and the best offer is 166.35, predict whether the best bid and best offer will be higher or lower than the initial best bid and best offer at the start of your prediction. Tally up how often you get this correct.

2. Trading Supply/Demand Runs

Purpose: Improve ability to execute on micro short-term price moves by looking at the limit order book and price action/volume chart of an exchange.

Result: A stronger ability to catch the correct side of a trend and execute limit orders.

Take a look at both a highly liquid order book as well as a standard price action/volume chart (such as the default from Tradingview or use ATAS with just price and delta) and determine the trend. Attempt to then get your limit order filled. To do this, go on a 1-minute price chart and pull up the standard limit order book. First, determine the dominant trend (or overall consolidation) and then look for the 4 types of market structures that make up that trend. Then, look at the current limit order book and determine whether a supply or demand run is likely to ensue. As an overall strategy, getting your limit sell filled during an overall downtrend can be done by waiting for a demand run or inactive equilibrium. Getting your limit buy filled during an overall uptrend can be done by waiting for a supply run or inactive equilibrium. Continue to do this exercise and attempt to get your limit orders filled at the best possible prices. Use



only a small portion of your trading capital for this exercise as this is meant for practice, not wealth creation.

3. Pattern Recognition of Order Depth

Purpose: Improve ability to recognize order depth patterns.

Result: A higher probability chance of getting on the right side of the trend when trading based on order depth.

Take a look at a chart of historical order depth (MDR or BAS) and mark up thresholds to buy or sell on multiple charts. This can be done by looking at multiple timeframes of the BAS and then marking thresholds (such as marking buy/sell thresholds for the 24h chart, 7d chart, etc.) or looking at various coins' MDRs and marking up buy/sell thresholds. Try this for at least 5 charts. Once price reaches one of the thresholds, look to see whether or not price responded in the manner that you had expected it to. Try practicing this daily with multiple coins and timeframes. Over time, you will improve your ability to recognize when it is best to buy/sell based on patterns of order depth. With this exercise, you have the option of either trading with live capital based on these patterns or just checking to see if you were correct or not.

4. See the Spoof

Purpose: Improve ability to detect spoofing plays from the heatmap.

Result: The ability to identify, avoid, and take advantage of spoofing.

Take a look at a heatmap (ATAS, Tensorcharts or other) and set a timer for 15 minutes. During this time, track the placement and pulling of large limit orders and predict the effect that a pull of a large limit order may have on price. For example, if you see that a large offer has been placed .5% above price and then after price falls, the offer is cancelled, predict whether price is likely to rise as a result or if the spoof will not have an effect on price. Count the spoofing patterns that you see and take a screenshot when you believe that you have identified a potential spoof play.



5. Locating Support/Resistance from the LOB

Purpose: Improve ability to gauge the strength from support/resistance levels within the heatmap.

Result: Can identify when a support/resistance level will hold or fall.

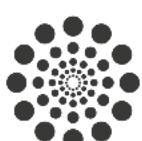
Take a look at the historical heatmap on the 5m timeframe of Tensorcharts of the coin of your choice and scroll as far back as possible. After scrolling far enough back, focus on the large limit orders that could potentially act as support/resistance levels. If a large limit order is aggressively filled by price, take a look at the price result (look for if price tends to continue to trend in that direction or if price stalls). Pick up on patterns of support/resistance levels from the heatmap. After analyzing large limit levels, slowly scroll forward in time to reveal what had actually happened to price. Keep going until you scroll all the way to the present time. Tally your results to see how often you predicted a price rise or fall.

6. Application of LOB Strategy

Purpose: Improve ability to recognize when to adapt a more position-based or order-based trading approach; better your reading of price action and volume.

Result: Have a greater chance of success in making strong limit order executions and an awareness of when to be patient or impatient in getting an order filled.

Using the bar replay tool to look at a historical price action and volume chart on Tradingview, decide whether it would have been a good time to take a position-based trade or an order-based trade. To do so, scroll as far back in time as you can and click the bar replay on a random price point. Once you place the bar replay down, begin analyzing price and volume and setting mock orders. Keep going until you scroll all the way to the present time. If you had chosen to take a position-based trade, track your results. If you had chosen to take an order-based trade, track how well your limit/stop orders were



placed and the trades that it led to. At the end of the exercise, look at your results. Did your position-based trades or order-based trades yield better results?

7. Stacked Imbalances Practice

Purpose: Improve ability to identify market aggression from stacked imbalances.

Result: To position yourself on the correct side of the market aggressors.

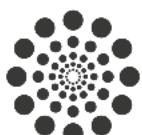
Using the platform ATAS (or another charting platform that shows stacked imbalances), use solely low-volume stacked imbalance settings (where many stacked imbalances appear on the chart) and price. Without looking at the price action, scroll as far back as possible. After scrolling back far enough, begin practicing by interpreting the interaction between price action and stacked imbalances. Make predictions based on where price will trend, and track to see how often your predictions were correct. Slowly scroll forward in time to reveal what had happened to price. Keep going until you scroll all the way to the present time. You can do multiple iterations of this exercise by looking at different coins or by changing the timeframe of the coin you are looking at (as well as the stacked imbalance settings).

8. Heatmap Practice

Purpose: Improve ability of interpreting the limit orders on a historical heatmap.

Result: To make better trading decisions when reading supply/demand from a heatmap and to make higher probability trades.

Using the 5-minute timeframe on Tensorcharts, on the coin of your choice, scroll as far back in time as you can without looking at the price action. Make predictions on which way price will trend and then slowly scroll forward in time to see how your predictions check out. Pay particular attention to instances when large limit orders pushed price in the opposite direction, as well as instances when large limit orders were filled by



price and the result that ensued for both. Like other exercises, you can do multiple iterations of this exercise by looking at different coins.

Well done! You have made it through the guide to the order book, order depth, and order flow. Your next step to mastery is through consistent practice.

The best types of practice are exercises that have a direct feedback loop in which you can make a prediction and then receive a definitive answer on your prediction as quickly as possible. Doing this time and time again will allow you to pick up on the cyclical patterns of the market. The market may change from one day to the next, but human nature does not. Locate the human element of the market and you can be ready for anything that comes your way. Happy trading.

