Price Inversion Market Making Systems (PIMMS)

Daniel Mark Harrison (daniel@zurcoin.com) / Sunday June 10 2021

1. Fault Logic In Cryptocurrency Market Making Systems

Market making systems in cryptocurrencies are predominantly used by exchanges and projects seeking to create (mostly artificial) liquidity for specific digital assets so that they gain a superior ranking on listing sites such as CoinMarketCap. Whether organic or synthetic, market making systems in use today with respect to cryptocurrency assets are fundamentally flawed. This is because they are derived from equity and derivatives automated market makers. The way that automated securities market making systems work is by setting bids slightly below the highest bid, and setting asks slightly below the highest ask. For example, in the following table the regular font orders may be considered bids and offers put in place by human traders while the bold ones are inserted by machine traders:

Bid	Ask
1.1	**1.5**
1.05	**1.8**
0.98	**2.5**
0.65	**2.55**
0.55	**2.75**
0.35	2.8
001	3.2

It appears at first glance as is the spread is 0.4 with a mean price of 1.3. In fact, given that the automated market maker is providing the bulk of liquidity (if indeed these orders are even real, which very often they are not) then the real spready is the one that the automated trader is making – in this instance, 0.52 (1.5-0.98). Apart from the obvious fact that an automated market maker has an ideal chance to "front-run" order flow through his own customers who are in front on the purchase and behind on the sale, there is a much greater problem with this technique of market-making, traditional as it may be, when applied to cryptocurrency markets.

The challenge and the opportunity with respect to traditional market making systems is that they are downward price biased. Take for example the spread quoted above: 1.1-1.5. This would ordinarily yield a mid price of 1.3, as I noted above. The problem is that with a liquidity-generating market making system, the bulk of the liquidity is actually at 0.98 on the buy side which is 25% or so away from the mid price, while sell side liquidity is only 15% awy from the Ask.

These sorts of market making systems work very functionally in markets where there is intrinsic value present, since investors are often looking to pick up "bargains" relative to other asset valuations in the securities market. This generates a higher level of liquidity on the Ask over time which means the downward pressure of the market making system in use only helps investors pick better valued securities. For example, a company that makes $1 million a year, if trading at 3x annual income, will quickly become bought up.

In digital currency markets the reverse is the case. Since there is no intrinsic value present in digital assets, downward-biased market making systems merely serve to decrease the overall

liquidity on the Ask and increase often destructively low bargain hunting on the Bid. As a result, many digital assets "pump" and then "dump", never to resurface again.

2. Key Considerations

As I have pointed out in previous papers before now, cryptocurrencies are little if anything but inflation sponges, sucking up excess fiat money supply and regurgitating it in a more distributed fashion so as to defray the hazard of domestically (or regionally) focused hyperinflation. Since monetary supply increase is over the long term upward-biased, there is no need to consider cryptocurrencies to be Ponzi schemes as some commentators have maintained. Cryptocurrencies are merely the mechanism via which inflation pressure is translated into a purchasable unit of spending and saving that benefits the consumer's demand considerations as opposed to damaging them. In this respect they may well be one of the most socially significant financial innovations to come out of the past millennia. Further, cryptocurrencies can be considered to be in another sense a harbor of virtualized value that plays a pivotal role in the Internet of Things (IoT) economy, mostly by way of making financing large-scale and disparate projects with multiple engineers all around the globe possible where it simply would take too long to execute in today's consumer and wholesale banking culture. Because of the increased potential for such financing innovation in the form of quasi-blockchain protocols such as second-layer blockchain platforms, much of that potential has indeed already arrived.

It is therefore a legitimate question to ask how we should differentiate market making systems between securities and digital currency assets if we are to ensure their longevity. The most important consideration that we need to satisfy by far appears to be the damage that "dumps" have overall on the cryptocurrency market. Because digital currencies have no intrinsic value, this presents the holder with an enormous level of uncertainty which often results in them selling their cryptocurrency assets as price gouges ensue due to abnormally large selling or an overall lack of buy-side liquidity. In other words, if we could design a system wherein every time the Bid side of the orderbook became progressively lower at a commensurately faster rate than the Ask side of the order book became higher, then we would encourage investors to buy up the digital currency as it was falling almost as rapidly as it came down in the first place.

3. Smart Contract

Bitzur (BZ) is a token that is designed to stabilize the market price of ZUR and to offer ZUR investors an additional storage-of-value enhancement over and above ZUR's value-utility. BZ is a token that is exchanged in return for wrapped Zurcoin. When Zurcoin is wrapped into token form and sent to the BZ smart contract the smart contract will read the API feed of CoinMarketCap's price for Zurcoin. The smart contract performs the following calculation, dividing whatever is the price of Zurcoin into the value 1 and multiplying the number of ZUR sent to the BZ smart contract in order to obtain the correct amount of BZ to send to the user. For example, suppose the user sends 1,000 ZUR to the BZ smart contract and the price of ZUR is $0.05, then:

$$(1/0.05)*1000 = 20,000 \text{ BZ}$$

As the price of ZUR increases, the amount of BZ produced by sending ZUR to the BZ smart contract also diminishes. For example, imagine that ZUR market price rises by 500% to $0.25, and another same user sends 1000 ZUR to the BZ smart contract after this event, then:

$$(1/0.25)*1000 = 4{,}000 \text{ BZ}$$

Now, there are a total of 24,000 BZ in issue with 2,000 ZUR stored in wrapped form in the ZUR smart contract. At the end of 100 days, all BZ holders have the option to send BZ back to its own smart contract whereupon it is burnt and a proportionate share of the ZUR stored in the BZ smart contract is returned to the sender. Assume that both users now send back their BZ to the smart contract for burning, each user receives:

User A: 20,000/24,000 = 0.83*2,000 ZUR = 1,660 ZUR
User B: 4,000/24,000 = 0.17*2,000 ZUR = 340 ZUR

The effect is one wherein users who mint new BZ with ZUR when Zurcoin is at the lowest possible price are rewarded with commensurately greater amounts of ZUR later on, all else being equal. When combined with a rising ZUR price, this has a compounding effect on returns. For example, in the above example, User A spent just $50 but by the point of exchange receives a value of $415 back in ZUR after the price increase to $0.25 is taken into account, representing a return of 730% in ZUR. Now imagine that the price rises in the interim period prior to the exchange by a further 100% and User A has earned a 1560% profit. User B, meanwhile, has spent $250 on his 4,000 BZ purchase and receives back the equivalent of $170 in ZUR. Although lower than his investment by around a third, an additional 30% or so value has been preserved in absolute terms by the rising ZUR price in the interim period between User B minting new ZUR and exchanging BZ for ZUR. In this way the utility of BZ is always coefficient with the underlying demand for ZUR.

4. Market Viability

Player #	Amt (ZUR)	ZUR (USD)	BITZUR	Percent	ZUR	Invest (USD)	Return (USD)	Profit/Loss (5)	Played (%)	VWAP
1	1000	0.01	100000	0.1742%	6090.273	$ 10.00	$ 7,308.33	72983.28%	0.07%	7.00182E-06
2	50000	0.02	2500000	4.3559%	152256.835	$ 1,000.00	$ 182,708.20	18170.82%	7.00%	0.001400364
3	25000	0.05	500000	0.8712%	30451.367	$ 1,250.00	$ 36,541.64	2823.33%	8.75%	0.004376138
4	625000	0.13	4807692.308	8.3768%	292801.606	$ 81,250.00	$ 351,361.93	332.45%	568.90%	0.739567287
5	1200000	0.06	20000000	34.8474%	1218054.681	$ 72,000.00	$1,461,665.62	1930.09%	504.13%	0.302478644
6	25000	0.07	357142.8571	0.6223%	21750.976	$ 1,750.00	$ 26,101.17	1391.50%	12.25%	0.00857723
7	520000	0.065	8000000	13.9389%	487221.872	$ 33,800.00	$ 584,666.25	1629.78%	236.66%	0.153829996
8	925000	0.045	20555555.56	35.8153%	1251889.533	$ 41,625.00	$1,502,267.44	3509.05%	291.45%	0.13115285
9	35000	0.13	269230.7692	0.4691%	16396.890	$ 4,550.00	$ 19,676.27	332.45%	31.86%	0.041415768
10	22000	0.15	146666.6667	0.2555%	8932.401	$ 3,300.00	$ 10,718.88	224.81%	23.11%	0.034659011
11	18000	0.2	90000	0.1568%	5481.246	$ 3,600.00	$ 6,577.50	82.71%	25.21%	0.050413107
12	2500	0.33	7575.757576	0.0132%	461.384	$ 825.00	$ 553.66	-32.89%	5.78%	0.019062456
13	8000	0.45	17777.77778	0.0310%	1082.715	$ 3,600.00	$ 1,299.26	-63.91%	25.21%	0.113429492
14	12500	0.85	14705.88235	0.0256%	895.628	$ 10,625.00	$ 1,074.75	-89.88%	74.39%	0.632351911
15	8500	0.99	8585.858586	0.0150%	522.902	$ 8,415.00	$ 627.48	-92.54%	58.92%	0.583311161
16	1200	1.2	1000	0.0017%	60.903	$ 1,440.00	$ 73.08	-94.92%	10.08%	0.120991458
17	9000	1.1	8181.818182	0.0143%	498.295	$ 9,900.00	$ 597.95	-93.96%	69.32%	0.76249825
18	3500	0.9	3888.888889	0.0068%	236.844	$ 3,150.00	$ 284.21	-90.98%	22.06%	0.19850161
19	3300	0.75	4400	0.0077%	267.972	$ 2,475.00	$ 321.57	-87.01%	17.33%	0.129971293
20	900	1.2	750	0.0013%	45.677	$ 1,080.00	$ 54.81	-94.92%	7.56%	0.090743593
Total (Avg)	3495400	-	57393154.14	-	-	$ 14,282.25	$ 209,724.00	1368.42%	-	0.205936931

Consider the table above. In this illustration, I show 20 example players who all play the BZ contract with ZUR at different points over a 100-day period where Zurcoin is trading between 10c and $1.20. The result of the simulation above illustrates that each investor on average is 6 times better off on a pure alpha return basis over the course of one year than they would be simply adopting a standard buy and hold strategy, and this is without taking into account any of the extraneous other aspects of cryptocurrency trading such as lacking liquidity on the Bid, amret sentiment etc.

Note that the users towards the end of the present cycle are down substantially on their investments by the point of the re-exchange of BZ to ZUR. In reality, this will be more than offset by two conditions by the same point in time in the subsequent cycle:

a) Many users simply won't re-exchange, but will instead choose to hold over BZ for more gains, thus compounding the potential returns achieved by those BZ holders and
b) With this much-reduced market supply, the effects are likely to be much more dramatic the next turn around, resulting in such holders who presently bear paper losses of 75%+ realizing real ZUR gains in USD terms in the many thousands of precent.

5. Conclusion

I have presented the first viable solution for market making cryptocurrencies in a way that allows them to remain volatile enough to permit speculators plenty of profit making opportunities from large price swings while simultaneously stabilize the overall swings so that they represent a greater degree of upward vs. downward momentum.

I have demonstrated the logic in which the contract works so that any digital currency innovator can henceforth now design and build their own "dump-proof" cryptocurrency ecosystem. I have partly done this in order to prevent the proliferation of scammers and quick-buck artists that come and go with new investors' cash, thus putting-off an evidently large number of the general public from holding any cryptocurrencies in their portfolio at all.

Like all market making systems, this one requires some discipline and consistency with respect to close monitoring, utilization etc. However I hope that in time Price Inverse Market Making Systems (PIMMS) will provide a welcome supplement to the tonic that is the developing digital asset market.