Gambling Crowds as Crypto-oracles?

Bridging the Real and the Blockchain through Utopian Markets and Oracular Shenanigans

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Introduction

Cryptocurrencies and gambling are intertwined. For one thing, there is the sheer volume of speculative investment in Bitcoin and the like. Fantastic rises and precipitous falls in the value of cryptocurrencies and other blockchain-based commercial offerings would be enough for many to write these markets off as idle speculation and its investors as gamblers (Rogers 2021). I did just that when visiting family over the Christmas period in 2020. Two of my relatives (neither with any experience in trading but some in gambling) were discussing their various cryptocurrency investments in the manner of day-traders (Zaloom 2006), pulling out patterns from a screen of trend lines and raw numbers. Couple this aura of speculation with the ethereality of the technology and it is easy to dismiss crypto-trading as a classic economic bubble, where fortunes appear to rest upon little more than a bet on red or black. More cynical yet, the common understanding that cryptocurrencies are dominated by wealthy 'whales' who 'pump and dump' stocks by promoting them and then offloading them puts

one in mind of video-slots. In these, what you see and interpret on screen is a positively distorted representation of the mechanistic algorithm that chugs away behind the scenes, metronomically draining your balance (Schüll 2012).

Another, less well-publicised reason why cryptocurrencies intersect with gambling is that the blockchain facilitates unregulated gambling. Gambling with cryptocurrency as stakes is not a phenomenon of cryptocurrencies in the same way that speculation on cryptocurrencies is; rather, cryptocurrencies simply enable internet gambling sites to skirt round local regulations. The fact that one is using a cryptocurrency to transact is incidental and potentially a hindrance to bettors, not least because the volatility of cryptocurrencies can end up surpassing the profits and losses of gambling with them. This is a speculation on my part, but I would wager that most punters would prefer to use state-issued currency if they were allowed to gamble with it in their jurisdictions. Regardless, when many cryptocurrency users are using it just so that they can gamble, the association leaves a residue.

This chapter focuses on a third way in which gambling and cryptocurrencies are intertwined, one intimately connected to the nature of the blockchain itself. Gambling can be used as a form of common-world-building. The creation of an accepted reality is a concern peculiar to cryptocurrency enthusiasts and to potential investors who are anxious about volatility. Crypto enthusiasts are well known for their resistance to centralized authority and its prescriptive truth, but this leaves a problematic lack of consensus that threatens the real-world translatability of cryptocurrency value. Crypto enthusiasts see this as a challenge: how to establish an authoritative version of events that can be used to arbitrate disputes? Some consider platforms known as crypto-oracles, crypto prediction markets or decentralised prediction markets as the solution to an-

choring the anarchic crypto crowd within a shared reality, and it all works through gambling. This chapter explains the problem and its perceived solution with recourse to theories of crowd dynamics.

The appropriateness of 'crowd' as a descriptor for what people with common interests do online depends on the extent to which the people within it consider themselves bonded in terms of their proximity, aims and movements, and whether they exhibit signs of disorder (Lee 2017: 84–85). This chapter describes online crowds of gamblers, whose individuals are acutely aware and thoughtful about the nature of the crowd of which they are part and reflect actively on their relationship to it. This is after all how gamblers choose their betting strategy – by comparing their reckoning with those of the rest of the crowd and deciding whether the price the crowd has settled on is too high or too low. The discussion here examines how this deeply individualistic approach to crowd participation has developed into a portal for engaging the real in a 'trustless' system.

Betting Exchanges and Dual Crowds

In order to understand crypto-prediction markets, it helps to be familiar with betting exchanges, the biggest of which is called Betfair Exchange. This technology is effectively the proof of concept underwriting all the current efforts to launch decentralized prediction markets. A betting exchange is a marketplace where two punters (a UK-English term meaning a person who gambles) can bet against each other at whatever odds they agree. One opts to be the bookie, i.e. the one against the outcome, and one is the punter, betting for it. To animate the technicalities, here is a hypothetical example.

I think you the reader are fantastically intelligent, charismatic and astute, and are quite a good outside bet to

become the next Prime Minister of the United Kingdom. I want to stake £10 at 200 to 1, so I put an order in on the betting exchange committing to that bet. The editor of this volume then comes along and while they like you and respect your acumen, they don't think you are on a path towards the top job in UK politics, even at odds of 200 to 1. They see my order of £10 at 200 to 1, which, as the bookie, would commit them to paying out £2,000 if you become the next Prime Minister, but he takes the £10 if you do not. The editor decides to agree, 'matching' my bet.

This is essentially a contract and, like some other contracts, it can be bought or sold at different prices. Let's say you have recently been recognized with an award and there is a real buzz about you in Westminster. Other people are now betting on you at odds that have shortened to 50 to 1. Still, I am beginning to get cold feet; I now think that the previous reader is a stronger candidate than you and that others will soon realize this too, so I think your odds will probably lengthen again. I could decide to capitalize on what I see as a temporary shortening of your odds, become a bookie and take other people's bets at the new odds. This means I now win £2,000 if you become the next Prime Minister on my original bet and lose £500 at the same time on my second bet. If you do not succeed this time, then I lose my initial £10 bet and win my second £10 bet. By taking up the opposite side of this second contract at shorter odds, I have traded my way to a substantial profit if you are the next Prime Minister and no liabilities if it does not happen.

If circumstances cut the other way – say the big award goes to another reader and no one is talking about you in Westminster – then I can cut my losses in the same way by acting as bookie for the longer odds that are now available, thereby losing less money than I would if I just stuck with my original bet.

An advantage of trading in this way is that if your liabilities even out across your bets on a market, you can get your stake back quickly and put it to use in another market. In the political markets offered in the United States, this kind of trading is made more intuitive because you simply trade shares in the different outcomes. You buy a contract that pays out $1 if it comes to fruition, $0 if it does not, and then you trade those contracts at whatever price you think it deserves. Once a market is set up, a crowd emerges that takes different positions on the likelihood of the outcome. The result being a dynamic price that responds to events. In *Crowds and Power*, Canetti notes the way in which crowds on the street emerge as a product of opposing crowd-consciousnesses:

> The surest, and often the only, way by which a crowd can preserve itself lies in the existence of a second crowd to which it is related. Whether the two crowds confront each other as rivals in a game, or as a serious threat to each other, the sight, or simply the powerful image of the second crowd, prevents the disintegration of the first.
> . . . Given that they are about equal in size and intensity, the two crowds keep each other alive. (1978 [1960]: 63)

In gambling markets these opposing crowds are necessary. Markets fail and are voided if there is illiquidity on one side of the ledger. The crowd's numbers are brought level not in the numbers of people on both sides, but through currency as a representation of confidence in the opinion. Moreover, the strength of conviction is quantitatively visible in the form of the odds that each crowd is willing to back and lay on any given market.

One important clarification is that a person may feel intensely that your odds of becoming Prime Minister are shorter than 200 to 1, but may be just as vehement that

your odds are longer than 50 to 1. These are not, for the most part, ideologically opposed crowds. Their opposition is over the proper interpretation of existing patterns, structures and trends. The crowds on one side of a bet and on another are likely to recompose back and forth as the odds move from one day to another. Furthermore, because political markets (such as who will be the next Prime Minister) could remain unresolved for months or years, the consensus can change considerably over that period. There are profits to be made in backing outsiders early on, but equally the composition of the opposing crowds will likely shift many times before a resolution. Market participants debate and consider options across WhatsApp groups, Twitter and on dedicated chat areas on specialist websites, thrashing out the relevant inputs and their correct weighting. These are therefore not two opposing crowds, but a dual crowd united around a single price and yet always in mutual opposition.

Prediction Markets

Betting exchanges are the platforms upon which the majority of political gambling happens these days. Prediction markets are the next step on our journey towards understanding crypto-oracles because prediction markets rest upon political gambling, and crypto-oracles rest upon prediction markets.

Prediction markets take the idea of gambling on politics and apply it to a far broader range of outcomes. Polymarket, a leading crypto-prediction market, uses the slogan 'Bet your beliefs' and offers a range of markets under the headings 'New', 'Politics', 'Crypto', 'Pop Culture', 'Trump' and 'Business'. Topics include the weather/climate, the scarcity of various commodities and their predicted prices, and who will win *Time* magazine Person of the Year. In

the United States, Kalshi, one of the tech start-ups trying to mainstream prediction markets, is selling itself as a market specifically for businesses to hedge against things that would be bad news for it. This prediction market is being sold as a new way to trade derivatives: your business depends on offshore drilling, one of the two major parties is opposed to offshore drilling, and so you bet on the party who are opposed to your business interests winning as a hedge against that party preventing you from profiting from more offshore drilling. These hedges depend upon the prediction markets being sufficiently liquid, i.e. having enough money moving around within them. The hedging strategy requires an astute set of predictors who offset those hedges and bring the market back into alignment with the true likelihood of that party coming to power. If Kalshi is successful in bringing in corporate hedges, this will lead to a large expansion in the profits possible for the professional and enthusiastic amateur gamblers with whom I work, as well as for the 'market makers', companies or individuals who provide liquidity to build and stabilize a market.

As the data on a given outcome build and the deadline for a resolution draws closer – for instance, as the votes are counted – the evidence of the impending outcome can quickly build up, and some traders scramble to escape their positions and others capitalize on their foreknowledge and release their capital for the next market opportunity. A good example of this was during the 2016 referendum on membership of the European Union in the United Kingdom. A political gambling enthusiast had posted some clever modelling on the website politicalbetting.com. The model projected how the vote tallies for individual constituencies would look if the result was a dead heat. They did this by modelling demographics and factors such as

United Kingdom Independence Party (UKIP) vote share in the most recent UK General Election. Even though results trickled in overnight, this piece of modelling enabled some gamblers to conclude around 11.30 pm that an upset was very likely because the first few results to be announced appeared to indicate a higher-than-expected proportion voting to leave. They pounced. The likelihood of a Leave vote climbed precipitously, and a great deal of money was won and lost before the outcome was announced. The argument goes that if the market question is framed well, the market will converge upon an outcome that aligns with real-world events, effectively resolving itself. This means that, in theory, the betting exchange provider never needs to ever take a position on what happened themselves; all they need to do is to mark the point when consensus exceeds the threshold of agreement.

There are times when an outcome is disputed, such as the 2020 US presidential election, when the incumbent, Donald Trump, lost the election but claimed that the election had been fraudulent. At these times, it is necessary for a betting exchange provider to intervene and decide the result or to void the market and return the stakes. It is here where the distinction between betting exchanges and some crypto-prediction markets is most clearly a reflection of the ideology and structural constraints of the latter.

Decentralized Prediction Markets

When I read the call for papers about crowd dynamics on the blockchain, my point of reference was *The Wisdom of Crowds* by the journalist James Surowiecki (2005), which is the Ur-text for nonacademics interested in prediction markets. Surowiecki's book turned heads by arguing that, given the right incentives, crowds make better decisions

than individuals, even individuals who are experts. In a sentence, the more diversity there is within a market, the greater its decision-making capacity when aggregated because the mistakes balance each other out and the insight converges on a single outcome. Surowiecki claims that the best way to bring this diversity together is usually through anonymous trading on a market, thereby avoiding some of the herding dynamics that occur when humans encounter one another.[1]

Whether or not prices in prediction markets represent real probabilities is vigorously debated among the community and in academic literature (e.g. Brown et al. 2019; Buckley 2017; Pathak et al. 2015). Nevertheless, the idea that they approximate real probabilities is crucial for the format's utility in the crypto community. Polymarket (launched in 2020) and Augur (version 2 launched in 2021) are Etheruem-based 'decentralized prediction markets'. Here is a taste of the questions which members of the Polymarket community are trading on at the time of writing: 'Will income taxes rise for the highest tax bracket in 2022?' (no trading at 87 cents a share); 'Will Russia expand its number of federal subjects by July 1, 2022?' (no is 96 cents a share); 'Will @realDonaldTrump tweet again by July 1st?' (no is at 98 cents a share); 'Will Jurassic World Dominion score 70% or higher Tomatometer Score?' (no is trading at 99 cents there). Notice the very high value of one position in these markets. This represents a high degree of consensus that something will happen one way and not another. The key to decentralized prediction markets as oracles is that this consensus *is* the resolution to the event.[2]

One of the primary issues on the blockchain is anchoring the chain to the physical universe to make conversions of value between them reliable and generally agree some facts. Another concern is resisting centralization, and these concerns are thought to be in tension. This enthusi-

astic blogger thinks that decentralized prediction markets can bridge and resolve both issues without compromises:

> At the end of the limit the outcome of an event must be reported. In the past, this was usually reported by the people who ran the prediction market itself (and you had to trust them to report correctly). With a decentralized system you can swap this out for various systems. A market for an event can have one person decide.
> If this person is trusted, then liquidity will come. If they are not, then multiple persons can report an outcome (where 2 of 3 need to agree, for example). Market participants can vote for who they want to report as well. Systems such as Augur has a token system where those who hold the token, vote on outcomes as a crowd.
> . . . Finally, and perhaps the most interesting, is that all you need is a threat of an outcome for the market converge to the right outcome [*sic*]. The closer to the time an event comes, the more it starts to converge to the actual outcome as clarity increases. Thus, in a way, the tokens become worth zero on the one side and 1 on the other, automatically resolving itself. In a scenario where this actually ended up wrong, users can put up a deposit to dispute it: which results in arbitrator [*sic*] that has to come in and decide. (De la Rouviere 2015)

The markets arbitrate most decisions, enabling consensus to form on what is happening in the world without a vested authority dictating which perspective is correct.

Earlier I mentioned the 2020 US presidential election, which is an example of when a consensus was not forthcoming, and this blogger sets their sights on an arbitrator as the solution. However, a more complex, more thoroughly decentralized solution is offered in the 'white paper' released by Augur (Peterson et al. 2018), which proposes a 'forking universes' solution.

According to the White Paper's abstract:

> Augur's incentive structure is designed to ensure that honest, accurate reporting of outcomes is always the most profitable option for Reputation token holders. Token holders can post progressively-larger Reputation bonds to dispute proposed market outcomes. If the size of these bonds reaches a certain threshold, Reputation splits into multiple versions, one for each possible outcome of the disputed market; token holders must then exchange their Reputation tokens for one of these versions. Versions of Reputation which do not correspond to the real-world outcome will become worthless, as no one will participate in prediction markets unless they are confident that the markets will resolve correctly. Therefore, token holders will select the only version of Reputation which they know will continue to have value: the version that corresponds to reality. (Ibid.: 2018: 1)

Augur's developers envisage disputed versions of events that fork into entirely separate universes from the original, genesis universe. When a market forks – for instance, if enough people dispute the 2020 US presidential election outcome – new universes are created. Forking creates a new child universe for each possible outcom: one where Joe Biden won and one where Donald Trump won.

The genesis universe freezes at this point, no new markets can be created within it and a gambler cannot cash out in the genesis universe; they must cash out in one of the child universes. Therefore, the markets and the gamblers must migrate to one of the child universes. It is not possible to migrate Reputation tokens between sibling universes, as inheritance rules prohibit it. Everybody is therefore forced to take a position on which universe is valid (Peterson et al. 2018: 6). After a period of time, the universe which has the most Reputation tokens is declared the winner.[3]

In this way Augur aims to solve the issue of adherence to reality through crowd-sourced consensus, without trust or with a minimum of trust. This is an apparently 'trustless' consensus decision. The apparent value of this system is to anchor crypto to real markets and thus to stabilize its fluctuations. However, once this is achieved, the possibilities are apparently very broad.

Oracular Shenanigans

New utopic frontiers bubble up in the minds of crypto enthusiasts, such as the following from the blog entry already quoted:

> How does one build ways to incentivise these new organisations (financial gain) & how do you help it make decisions? You use prediction markets. Just as these hashtag organisations move like crowds do, so should its decision making. As the organisation goes about its goals, various outcomes are constantly generated, upon which the people in the organisation and those outside of it, bet on the outcomes, leading it automatically towards outcomes which serve the goals of the organisation. (De la Rouviere 2015)

Here, using the language of crowds, the blogger envisages prediction markets as the decision-making mechanism of an online crowd, thus magnifying its potential for real-world impact. Since its inception, the internet of things has cascaded into our homes and big data have poured into the hands of companies and governments. The blogger imagines a world in which one bets on the success of the coffee shop you frequent, and our toasters send data to bots that micro-bet on the supply of wheat based on what they know of your toast consumption. Our entire economic and political landscape is transformed through betting.

The starting point and the end goal, potentially, is 'futarchy', a term coined by the economist Robin Hanson in 2000 and one that is at the heart of crypto-utopian ideas of governance. Hanson posted a manifesto on George Mason University's website:

> In futarchy, democracy would continue to say what we want, but betting markets would now say how to get it. That is, elected representatives would formally define and manage an after-the-fact measurement of national welfare, while market speculators would say which policies they expect to raise national welfare. The basic rule of government would be:
>
> When a betting market clearly estimates that a proposed policy would increase expected national welfare, that proposal becomes law.
>
> Futarchy is intended to be ideologically neutral; it could result in anything from an extreme socialism to an extreme monarchy [a minimal state run according to libertarian theory], depending on what voters say they want, and on what speculators think would get it for them.

A few blockchain-based organizations have been working towards instituting this system of decision making for themselves and have attempted to sell such a platform to companies, all the while talking up the possibilities for futarchy at the level of the nation state.[4] One of my interviewees, a UK civil servant and an active participant on the reputation-token based Metaculus forecasting site, boldly predicted a future in which a single nation state will implement a system of governance based on prediction markets. This system would then be so successful that most other nation states would quickly follow suit, leading to a transformational change in how the world governs itself.

The specific appeal of futarchy for blockchain organizations is to harness what the community supposes to be a

highly heterogenous crowd of users and owners, and turn these into an effective means of self-governance. Furthermore, in the case of Augur, the system of governance is radically decentralized, precisely because prediction markets are not resolved when *CNN* calls the election in favour of one candidate, but when the Augur trading community's financial interests reach a consensus that the call is correct. In the process, futarchy simultaneously narrows what crowds can be because they must always be gamblers on either side of a bet, and expands the importance of crowds by extending the range of activities that one can perceive through the prism of the gambling crowd.

Conclusion: Bubble-Works

This chapter examined a specific subtheme of crowding behaviour: the apparently anarchic quality of crowds on the blockchain. 'Trustless' blockchain crowding appears swamped by crazes and unpredictable self-generated dynamics. I have described crypto-prediction markets as attempts to curtail or harness that turmoil, while retaining the apparently essential quality of 'trustlessness'.

It occurs to me in the summing-up that the perceived dynamics of crowd theory, cryptocurrencies and prediction markets share the metaphor of bubbles. Cryptocurrencies are very often seen as a lather of interconnected speculative bubbles, and the interrogation and bursting of bubbles of common wisdom within prediction markets are a key strategic asset for participants in these markets. According to crowd theory, crowds are considered amorphous and disconnected, and lacking the goal orientation of a network. In the open form described by Canetti (1978 [1960]: 17), crowds they too froth and lather uncontrollably until bubbles of closed crowds form. These closed bubbles may float away or break apart within the froth again.

Despite this chaotic image, another branch of theory and a small corner of the economy think that the crowd creates wisdom of a sort (a predicted outcome) assuming a proper filter and incentivization. The filter can be a predictive question: who will be the next Attorney General of California? And opinions can be very diverse while coming up with a valuable aggregate answer. The incentive that underwrites interest in this project is personal gain. Everybody wants to win, or to hedge and win elsewhere. Intertwining financial incentive with accurate prediction and reporting thereby anchors cryptocurrencies to real-world events.

The potency of this idea has led to imaginative extrapolations (or thought bubbles) where you bet on your favourite coffee shop being successful as well as buying coffee there, so that you are financially rewarded. Taken to this extreme, the diversity of opinion that is so vaulted among those who subscribe to the efficient markets, wisdom of crowds or futarchy point of view is severely curtailed by the incentives themselves. The reality as I have observed it is a crowd that is hyperaware of itself as being a crowd. Its members are engaged in a constant process of metamorphosis in reaction against the assumed consensus thinking within the crowd, in the pursuit of profit at the expense of the crowd itself. Therefore, the resulting crowd is full of cunning thinking, but is anti-revolutionary by design, an amalgamation of maximizing individuals whose sharpest insights are intellectually flattened by the profit motive. The crowd's revolutionary potential and natural force is thereby muted and co-opted. I argue that crypto-prediction markets are both structurally inventive and curiously lacking in imagination because they all settle on markets as their arbiters, in the mould of the economist Friedrich Hayek. This paucity of imagination flattens

what revolutionary potential may have existed in the new technology.

It is therefore fair to say that crypto-prediction markets sit squarely within the lineage of countercultural reactionary thinking outlined in the Introduction to this volume. Communalism through fragmentation is built into the structure of crypto-prediction markets in a manner that lashes together communities' moral and economic roles into a single ideologically pragmatic package that promises to realize the iconoclastic fantasy of trustless community. Crypto-prediction markets may yet prove themselves to be powerful tools in the crypto space, but my observations suggest that adoption has been sluggish. The limiting factor appears to be a lack of interest and a corresponding lack of liquidity, thereby indicating a deficiency of conviction in the legitimacy and potency of the platforms themselves. Achieving futarchy requires that cryptocurrency users buy in to the platform, but the absence of a crowd large enough to create efficient markets on the platforms prevents the markets from achieving the community-building effects their builders envisage. I conclude that, at present, believers in futarchy live in a bubble of sorts, even among crypto enthusiasts. The ideology of cryptocurrency enthusiasts is self-evidently pro-market, but, like most of the rest of us, the community at large remain justifiably cautious about delegating matters of truth and reality to the invisible hand.

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Notes

1. Borch (2007) refutes this thesis by pointing out that in crowd theory, actors are neither rational nor irrational and that when they are aggregated, their actions are a dynamic that exceeds the dichotomy.
2. To be frank, my fieldwork is based almost entirely in the UK legal betting exchanges and my knowledge of other exchanges is at a background level. I am not an expert in this community and I am going by their self-description here.
3. It is possible to wait until a winner is declared and then migrate your tokens to the winning universe after the fact.
4. See https://www.youtube.com/watch?v = XonwBPXpyJQ 2018 (last accessed 29 September 2023).

References

Borch, Christian. 2007. 'Crowds and Economic Life: Bringing an Old Figure Back in'. *Economy and Society* 36(4): 549–73.

Brown, Alisdair, J. James Reade and Leighton Vaughan Williams. 2019. 'When Are Prediction Market Prices Most Informative?' *International Journal of Forecasting* 35(1): 420–28.

Buckley, Peter, 2017. 'Evidencing the Forecasting Performance of Predication Markets: An Empirical Comparative Study'. *Journal of Prediction Markets* 11(2): 60–76.

Canetti, Elias. 1978 [1960]. *Crowds and Power*, Carol Stewart (trans.). New York: Continuum Publishing Corporation.

De la Rouviere, Simon. 2015. 'Why & How Decentralized Prediction Markets Will Change Just about Everything.'. Retrieved 19 August 2023 from https://medium.com/@ConsenSys/why-how-decentralized-prediction-markets-will-change-just-about-everything-15ff02c98f7c#.kx6yj73jl.

Lee, Raymond. 2017. 'Do Online Crowds Really Exist? Proximity, Connectivity and Collectivity'. *Distinktion: Journal of Social Theory* 18(1): 82–94.

Pathak, Deepak, David Rothschild and Miroslav Dudik. 2015. 'A Comparison of Forecasting Methods: Fundamentals, Polling, Prediction Markets, and Experts'. *Journal of Prediction Markets* 9(2): 1–31.

Peterson, Jack, Joseph Krug, Micah Zoltu, Austin K. Williams and Stephanie Alexander (Forecast Foundation). 2018. 'Augur: A Decentralized Oracle and Prediction Market Platform'. Retrieved 4 September 2023 from https://arxiv.org/abs/1501.01042.

Rogers, Gayle. 2021. *Speculation: A Cultural History from Aristotle to AI*. New York: Columbia University Press.

Schüll, Natasha. 2012. *Addiction by Design*. Princeton: Princeton University Press.

Surowiecki, James. 2005. *The Wisdom of Crowds*. New York: Anchor.

Tech Open Air. 2018. 'What Is Futarchy? – Trading on The Future – Friederike Ernst #TOA18'. Retrieved 19 August 2023 from https://www.youtube.com/watch?v = XonwBPXpyJQ 2018.

Zaloom, Caitlyn. 2006. *Out of the Pits: Traders and Technology from Chicago to London*. Chicago: University of Chicago Press.