

# market notes:

# The Pulse of Digital Asset Markets

How are digital assets doing? Not price...the fundamentals? With so many assets – and so much data – it's been hard to answer that question, until now. Welcome to The Pulse: a systematic snapshot of the digital ecosystem's fundamental health. We translate on-chain data on more than seventy assets into the health of digital assets with a single number – The Pulse. The Pulse suggests that the worst of the fundamental downdraft is behind us.

16 September 2022

Marcel Kasumovich and Mathias  
Nwokejiobi

**How are digital assets doing? Not price...the fundamentals? With so many assets – and so much data – it’s been hard to answer that question, until now. Welcome to The Pulse: a systematic snapshot of the digital ecosystem’s fundamental health. We translate on-chain data on more than seventy assets into the health of digital assets with a single number – The Pulse. The Pulse suggests that the worst of the fundamental downdraft is behind us.**

**market notes... The Pulse of Digital Asset Markets  
9/16/22 - Marcel Kasumovich and Mathias Nwokejiobi**

1. Pulse. It is a fundamental sign of life. The simple measure of heartbeat provides incredible insight on health, taking an impossibly complex system of arteries down to a single, intuitive number. The simple measure of the number of heartbeats in a minute provides incredible insight into health, taking an impossibly complex system of arteries down to a single, intuitive number. Its use as a health diagnostic stands the test of time, referenced in the oldest known written story, Gilgamesh, in 2600 BC. Today, pulse is interpreted with nuance, building on thousands of years of experimentation and study.
2. Who are we to argue with thousands of years of research and development? Our goal is to measure the pulse of the digital asset ecosystem. It starts with data. Digital assets are rich in on-chain metrics. Making sense of that data is an undertaking, and we learned by doing. The inputs must be simple enough to capture the most relevant common fundamentals across digital assets, but not so simple as to detract from their usefulness. We strive for a balance in creating the Pulse, now a year in development.
3. The Pulse is a single number that summarizes the fundamental health of digital asset markets. It is based on the Coinbase CORE Index constituents, though more than seventy assets and customized scores are available at our fingertips. It is intentionally built to avoid connection to market prices – the attention is on fundamentals. We organize those fundamentals to be descriptive, not necessarily predictive, of future prices. The lessons we learn will integrate into our asset management toolkit in more nuanced ways, ranging from risk management to trading signals.
4. The Pulse was 52.7 for the One River Digital Core Index as of midnight Thursday, close to a neutral reading (Figure 1). The score is calibrated so that 50 is neutral inside a range of 0 to 100. A value above 50 indicates that overall activity in the ecosystem is growing, like a traditional Purchasing Manager Index. Interestingly, there is considerable dispersion across constituent assets today (Figure 2). Bitcoin and its close relative, Litecoin, are positively influencing the Pulse reading. However, Ethereum and Polygon are contracting with weak levels, despite substantial development progress, a negative influence. This isn’t proof-of-work beating proof-of-stake – Bitcoin Cash has the weakest score.
5. Let’s look under the hood of the headline Pulse. Figure 3 shows the category scores in Index assets with complete data. There are seven categories of fundamentals that are integrated into the score, from the volume of transactions to the distribution of assets across the network. Hundreds of on-chain data are copied, calculated, normalized, and stored to populate those fundamental categories. Scores are updated at midnight ET every calendar day – digital never

sleeps. The tool makes it easy to glean themes – most notable, fundamental weakness today is being driven by measures of adoption. User growth, active users, and asset transfers are all at weak levels. It's winter in digital asset markets, after all.

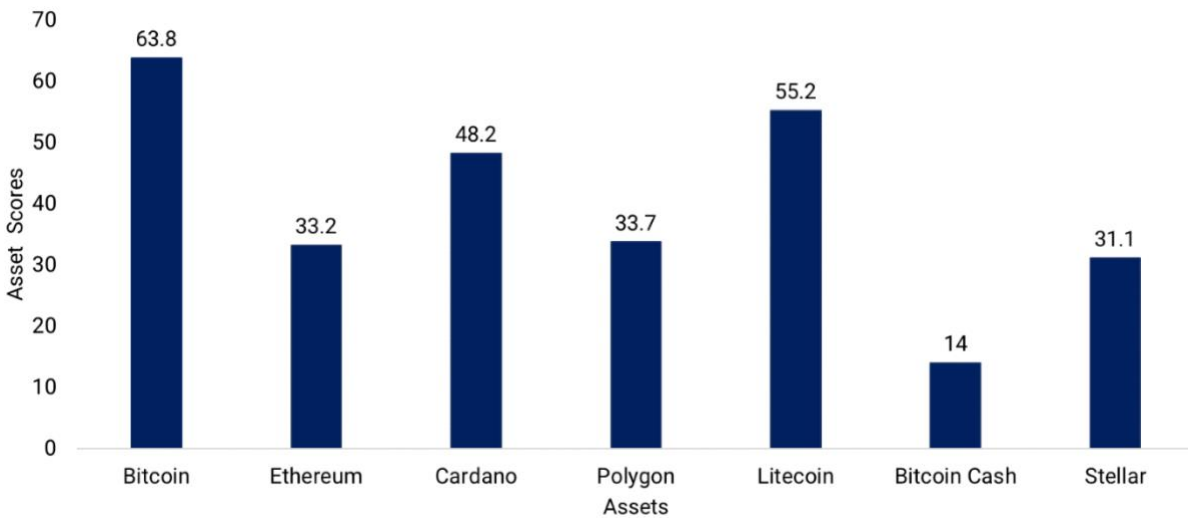
6. We've been running the Pulse for several months internally. It helps us refine our understanding of digital assets, and we will continue to build unique indicators accordingly. There are two dimensions that matter for expanding knowledge – depth and breadth. We are adding depth through asset-specific indicators that we will categorize into the health diagnostics in the future. To expand broadly, we added two macro indicators to the Pulse.
7. The Pulse's macro reading is based on economic data from the Institute of Supply Managers. Economic activity is divided into four states, from high-and-rising activity to low-and-falling. Transition probabilities are estimated to capture the odds of moving from one state to a future state based on historical experience (Figure 4). The probability-weighted economic state is calibrated to mirror the 0-to-100 scale of the Digital Pulse. A weak, improving Macro Pulse reading signals a cyclical upward trend in digital asset prices. A strong, eroding Macro Pulse reading warns of a downward trend.
8. The Digital Financial Conditions Index (DFCI) is a faster-twitch macro muscle. Like traditional FCIs, it is based on short-term rates, credit, equity, and foreign exchange. But it is drawn only from the digital ecosystem. Figure 5 illustrates the Digital FCI relative to our Size-Tilt Index. Two observations are notable. First, 2021 tightening in financial conditions was well ahead of the price downturn, an early warning indicator. Second, digital asset prices have declined disproportionately, undershooting financial conditions. The Digital FCI Pulse measures changes in the DFCI, capturing marginal tightening or easing. It complements fundamentals, recognizing macro conditions slow the transmission of fundamentals to price.
9. The Digital Pulse suggests that the worst of the fundamental downdraft is behind us. The same is true for financial conditions, which have tightened to the same degree as past crypto winters, notably and surprisingly more slowly. However, the Macro Pulse indicates that conditions are weakening, and yet to find their floor. This week's upside surprise to US inflation is indicative of the macro influence over digital asset markets – accelerated rate hikes are expected to quash inflation with a greater risk of recession. A trough in the Macro Pulse would send a consistent positive message on the next cycle's trend – we're closer, just not yet there.
10. Like any health diagnostic, different doctors draw different inferences in the pulse. You will have the opportunity to read the Pulse through your lens. Starting next week, our Digital Daily will be dedicated to The Pulse each Friday. With more than 70 assets covered across a wide range of indicators, the tool has a lot to offer. Your questions will make it more powerful. Please contact Mathias if you would like to be added to the Digital Daily or for a demo of the live tool on our intranet.

**Figure 1: Digital Pulse Scores for One River Indices**



Source: Coin Metrics. One River Digital Calculations. Percentage changes are weekly.

**Figure 2: Pulse Network Scores**



Source: Coin Metrics. One River Digital Calculations.

**Figure 3: Index Constituent Breakdown**

Assets	Asset Score	Volume	Transfer Count	Active Users	User Growth	Valuation	Velocity	Network Distribution
Core	52.7	64.4	45.0	42.9	28.4	34.1	65.9	87.9
Size Tilt	46.9	58.8	34.5	33.9	25.9	34.4	55.7	85.3
Bitcoin	63.8	69.5	55.8	56.7	39.1	26.8	98.8	99.6
Ethereum	33.2	58.7	31.2	21.6	6.8	49.6	0.8	63.7
Cardano	48.2	43.8	16.6	10.1	33.9	34.1	99.3	99.9
Polygon	33.7	54.8	10.4	8.4	10.4	51.9	10.5	89.2
Litecoin	55.2	59.1	27.7	42.6	42.5	15.5	99.8	99.5
Bitcoin Cash	14.0	40.2	2.5	5.0	5.4	24.5	0.3	19.8
Stellar	31.1	31.4	3.0	29.8	32.9	19.7	0.5	100.0

Source: Coin Metrics. One River Digital Calculations.

**Figure 4: Macro Pulse Probability Transition Matrix**

<p><b>LOW RISING</b></p> <p>3m Probability Transition 0%</p>	<p><b>HIGH RISING</b></p> <p>3m Probability Transition 29%</p>
<p><b>LOW FALLING</b></p> <p>3m Probability Transition 13%</p>	<p><b>CURRENT STATE</b></p> <p><b>HIGH FALLING</b></p> <p>3m Probability Transition 57%</p>

Source: Coin Metrics. One River Digital Calculations.

**Figure 5: ORDAM Financials Conditions Index vs One River Size Tilt Index**



Source: Bloomberg LP. MVIS. One River Digital Calculations.

# Disclaimer

This communication, including any attachments, is intended only for the use of the addressee and may contain information that is confidential or otherwise protected from disclosure. Any unauthorized use, distribution, modification, forwarding, copying or disclosure is strictly prohibited. If you have received this communication in error, please delete this message, including any attachments, and notify the sender immediately. The information and any disclosures provided herein do not constitute a solicitation or offer to purchase any security or other financial product or investment and is not intended as investment, tax, or legal advice. Unless otherwise noted, all information is estimated, unaudited and may be subject to revision without notice. Past results are not indicative of future results.

This communication may contain statements of opinion, including but not limited to, the author's analysis and views with respect to: digital assets, projected inflation, macroeconomic policy, and the market in general. Statements of opinion herein have been formulated using the author's experience, research, and/or analysis, however, such statements also contain elements of subjectivity and are often subjective in nature. In addition, when conducting the analyses on which it bases statements of opinion, the author(s) will incorporate assumptions, which in some cases may be shown to be inaccurate in the future, including in certain material respects. Nothing in this presentation represents a guarantee of any future outcome. The author(s) are under no obligation to update this document, notify any recipients, or re-publish the content contained herein in the event that any factual assertions, assumptions, forward-looking statements, or opinions are subsequently shown to be inaccurate.

Certain information contained in this Communication constitutes "forward-looking statements," which can be identified by the use of forward-looking terminology such as "may", "will", "should", "expect", "anticipate", "target", "project", "estimate", "intend", "continue" or "believe" or the negatives thereof or other variations thereon or comparable terminology. Forward-looking statements made in this communication are based on current expectations, speak only as of the date of this communication, as the case may be, and are susceptible to a number of risks, uncertainties and other factors. Assumptions relating to the foregoing involve judgments with respect to, among other things, projected inflation, the regulation of digital assets and macroeconomic policy, all of which are difficult or impossible to predict accurately and many of which are beyond our control. In light of the significant uncertainties inherent in the forward-looking statements included herein, the inclusion of such information should not be regarded as a representation to future results or that the objectives and plans expressed or implied by such forward-looking statements will be achieved.

Certain information contained herein may have been obtained from third party sources and such information has not been independently verified by the author(s). References herein to third parties are for illustrative purposes and are not an endorsement or recommendation for products or services. No representation, warranty, or undertaking, expressed or implied, is given to the accuracy or completeness of such information. While such sources

are believed to be reliable, the author(s) do not assume any responsibility for the accuracy or completeness of such information.

The information and any disclosures provided herein do not constitute a solicitation or offer to purchase any security or other financial product or investment and is not intended as investment, tax, or legal advice. Unless otherwise noted, all information is estimated, unaudited and may be subject to revision without notice. Past results are not indicative of future results.