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A Naive Economics Perspective on Nonfungible Tokens

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Can NFTs tell us about the future velocity of meme culture economics?

I first heard the word “fungible” used by a sociology professor when I was an undergraduate student many years ago. He was discussing Vladimir Lenin’s account of the “fungibility of truth”: truth was whatever was needed to facilitate the dictatorship of the proletariat, reinforce revolutionary principles, and so forth. I was struck at that time that this seldom-used word seemed to be a universal authoritarian mantra—a galvanizing principle shared by dictators and tyrants of every stripe. These days the term has been resurrected from the dustbin of lexicography, this time to describe a class of investment assets called nonfungible tokens (NFTs). As an aside, fungibility has a wider range of applications that one might imagine. For example, fungible credentials have displaced counterfeit credentials as a “go-to” instrument of 21st century fraud.¹

An NFT is a purportedly unique digital identifier that is recorded in a block chain, the attendant metadata of

which can contain information on provenance of an associated token. In some contexts, and within very small communities, this NFT may then take on a value—perhaps, but not necessarily, monetary. Presently I shall focus my discussion of fungibility to NFTs from the perspective of

“naive” economics—naive in the sense that the analysis is informal and expressed in natural language rather than mathematical formalisms. This is an effort toward common-sense analysis of NFTs. It will be claimed that NFTs turn the concept of economic value on its head.

THE INTRACTABILITY OF UNIQUENESS AND OWNERSHIP OF RIVAL GOODS

We begin with an introduction to the concept of value. Throughout history, civilizations placed value on artifacts that have been difficult to obtain for reasons of scarcity or uniqueness—at least for a particular place and time. Historically, establishing widespread consensus on the value of such artifacts has proved challenging. For this reason, the need for systems of barter, negotiation, and pricing became obvious. The concept of value provided the necessary inertia for the social recognition of ownership, which in turn necessitated the creation of laws. We don’t have to dig too deeply into history to become one with the notion that if artifacts have value, a stable society must provide

¹Digital Object Identifier 10.1109/MC.2026.3692333



some mechanism for establishing ownership to avoid social conflict. For centuries, provenance or custodial history has served society as a useful, anecdotal mechanism for authenticating the ownership of artifacts such as fine art and antiquities. Comparable legal means of authentication of ownership created for real, intellectual, and intangible property.

Where do NFTs fit in the scheme of things? The antecedent question should be a more fundamental one: What does one have to do to turn a nonrival good into a rival good? In the case of NFTs, the starting point is a nonrival good frequently in the form of some digital artifact? But in order to be valuable, the NFT has to be transformed into something unique. Like Peter Pan, we have to apply some pixie dust to the binary digits to imbue it with uniqueness and enhance its value. And how do we do that? We add metadata that documents that this token string of 0s and 1s is somehow more valuable than identical twins. So it isn't the symbolic token (digital artifact) that is valuable, but a transcribed record of its existence (our pixie dust metadata in the form of a record in a block chain ledger) that is valuable.

Notice how this situation differs from our experience with fine art. Contrast Georges Seurat's painting *A Sunday Afternoon on the Island of La Grande Jatte* (artifact) with a typewritten account of the painter creating the scene in 1884 by an unidentified author (metadata). The typewritten account may be used to contribute to the authentication of the claim that the purported Seurat painting is genuine, but beyond that this metadata could only have historical interest. The painting, however, speaks for itself. Even if the purported painting were counterfeit, it would retain some aesthetic, if not economic, value. The counter-intuitive belief that digital tokens (strings of 0s

and 1s) can ever have value stresses the imagination beyond recovery. There are counterexamples, of course. For example, one might imagine a case where a digital token was the uncirculated, first digital draft of important intellectual property—say the discovered cure for cancer. But in this case any attendant value would not be for the digital draft itself, but rather in its subsequent use (for example, patent, royalty, or license). But this anomalous situation doesn't apply to NFTs.

Satisfy yourself that there are potentially infinitely many unique digital tokens of "firsts," each of which can in principle be documented as follows:

- › documentation of the first use of the colon, hyphen, and right parenthesis symbols to designate a happy face on a typewriter
- › documentation of the first use of the colon, hyphen, and right parenthesis symbols to designate a happy face on a computer monitor
- › documentation of the first use of the colon, hyphen, and right parenthesis symbols to designate a happy face on an LED display
- › documentation of the first use of the semicolon, hyphen, and right parenthesis symbols to designate a happy face on a typewriter
- › and so on.

On what rational basis might we assign a value to these? The valuation of NFTs is a product of the same psychology that drives prediction marketing via crowdsourcing. The market value of an NFT is what an amorphous crowd thinks that the value should be. Investing in an NFT is a reflection of a belief in the probability of a market price. But this has nothing to do with tokens—fungible or otherwise.

ON VALUE IN GENERAL

So the general agreement that something has value is what makes it valuable. And these values are ephemeral. Examples abound where a society places value on something which subsequent generations dismiss. In the middle ages, blue pigment made from lapis lazuli were rare enough that only the wealthiest could afford artifacts created with it. For the last few centuries, a variety of shades of blue pigments became widely available so the value of lapis lazuli pigment decreased. This is explained by the principle of supply and demand. How would this have changed if an artifact made from this lapis lazuli was accompanied by a definitive, documented history that traced source of the pigment back to one specific mine and one artisan in the far east? The point is that economic theory historically has never severed the valuation of an object from the object itself and as a consequence is ill prepared to account for the primacy of provenance.

We may expand our account of value beyond the rarity of goods. Supply and demand also works for placing value on goods based on cost of production, the cost of replacement, the utility to consumers, the amount of labor saved by services, objectively indispensable to sustaining life, and so on. But in all of these cases, the characteristics of value, whether enduring or ephemeral, subjective or objective, whether based on use or individual, cultural, or religious beliefs, always seem to be associated with some object, artifact, or activity—whether tangible or intangible—relating to a thing being commoditized.

In one way, the closest analog to NFTs is a class of spoozy intangible assets that appear on balance sheets: for example, business reputation, goodwill, trademarks, brand value, and know-how. But even in these cases,

there is some asset, nonmonetary and insubstantial to be sure, that is valued. But were we to apply the valuation model for NFTs to these examples, value would be determined not by the amount of goodwill that an organization generated, or its reputation in the community, but rather the metadata that recorded how the value of goodwill, reputation, or brand were calculated including the people involved, minutes of the meetings, actions taken, votes recorded, and so forth. NFTs are seen in this sense to be internally created intangibles even more detached from reality. While it may make sense to say that the Pepsi brand is of more-or-less value than the Coca Cola brand because of the commercial appetite for a product, what is the commercial appetite for one occurrence of a colon, dash, and right parenthesis over any other. If I can document that a screenshot is the first recorded appearance of a colon, dash, and right parenthesis on computer screen I no longer require a token of the colon-dash-right parenthesis image. The image is irrelevant to the historical proof, and hence the value. Any string “: -)” serves just as well, whether in Times Roman or Courier, on IBM terminals or notebook computers, CRTs or LED screens, or on paper.

NFTs AND CRYPTOCURRENCIES

A comparison between NFTs and cryptocurrencies is natural, but must be nuanced. The move from monetary systems anchored on commodities of “intrinsic value” (for example, precious metals) to those based on fiat currency broke an economic Gordian Knot of constraints on governments which were seen to interfere with the goal of achieving economic stability. Fiat currency together with the 1944 Breton Woods system made it possible for governments to use monetary policy to accomplish a variety of broader objectives such as price and wage stability, control of interest rates and inflation, reduced unemployment, and

so on. After Bretton Woods, currencies began to float against each other, bound together only by generally agreed upon exchange rates.

When countries moved to fiat currency, the citizens of their nations were expected to take a leap of faith in believing that their country’s money had value because their government said that it did—independent of any tangible backing (like gold or silver) behind it as was previously the case with representative money. If a sufficiently large percentage of the population share this confidence over time, the system works. The same holds true for digital currency: If people have confidence in the reliability and stability of electronic funds transfers, the system works. And, anecdotally, this system seems to have worked well for the past century. However, what underlies this confidence is the governments *promise* that its currency, in whatever form, carries with it the full faith and credit of the government.

The success of fiat currency underscores the confidence that people have in their government and financial system while recognizing full well that this confidence is based on little more than the banking system pushing digital information from one computer system to another. This confidence lies in the implied “full faith and credit” by the central banking authority designated by the current government, specifically that the currency will be accepted by the government as legal tender for commerce. This is precisely where cryptocurrency currently differs from fiat currency. The perceived value of cryptocurrency is not reliant upon the central banking authority of a government. Nor does it carry with it the “full faith and credit” of a government. The perceived value depends upon the full faith and credit of amorphous, anonymous, online crowds.

We note that the most intense initial scrutiny given to cryptocurrency did not deal with the basic of perceived value, but rather transaction security, the integrity of the digital

ledgers involved, the ability for the cryptosystem to recover from security failures, and the potential for misuse by criminals to support illegal activity.² This began to change in the early 2000s because of the success of crypto markets. Motivated by government regulators, politicians pressed for the development of regulatory environments in which cryptocurrencies could be placed.^{3,4,5,6} The point is that the dominant initial concern was with the technology and not whether cryptocurrencies were based on sound economic principles. The question of whether there was a legitimate basis for confidence in the value of cryptocurrency was avoided in favor of enthusiasm with new technology.

One shared feature behind NFT and cryptocurrency is the conscious decision to avoid dealing with foundational economic principles. Another common feature is that both rely on the same blockchain technology for authentication. The major difference lies in the fungibility of the blockchain record as defined by the Ethereum standards for the ownership of digital assets within the framework of “smart contracts.” An earlier Ethereum standard, ERC-20, that defined fungible tokens for smart contracts dealing with cryptocurrency⁷ was adapted in the later Ethereum standard, ERC-721, to specifically deal with nonfungible tokens.⁸ Simply put, ERC-20 was focused on authenticated ownership, approvals, transfers, and the like for digital currency, where there was no need to distinguish ownership for each individual token referenced in a contract. The analogy would be actual dollar bills exchanged between physical wallets. From the point of value, they are interchangeable between and among wallets. However, ERC-721 expanded upon the ERC-20 standard to include the notion of a token “deed” that also attaches provenance to the token. To carry our analogy forward, with ERC-721 we can account for the ownership of individual dollars identified by serial number, wear characteristics,

fingerprints, and trace DNA. We might imagine the token being a dollar bill that was found in the hand of an ex-hummed dictator on the day the Titanic sank. It is possible that someone might attach value to this token in excess of US\$1.

NFTs borrow on some traits of historical stores of value. An NFT uniqueness is defined as having its own address on a blockchain. NFTs receive their value based on the imaginary “full faith and credit” within a collection of anonymous NFT collectors. Some NFTs might amount to a few pixels in a bitmap, while others might reference events of historical significance. Some are just considered collectibles and some can be used as a pass to get into secret clubs. The operative financial framework is this: Perceived value is the value that is perceived by some anonymous group or other. The circularity of this definition underscores the detachment of NFTs from economic reality. Artificial as they are, these values are capable of swinging wildly and drastically, from zero to unobtainium at the speed of light. Mass speculation drives prices up quickly and forces them to plummet twice as fast through the medium of cryptocurrency. This is a perfect marriage. NFTs and cryptocurrency occupy share the same naive economic foundation within schemes of self-indulgent marketing.

This is necessarily a limited perspective on NFTs. Important scholarship has dealt with NFTs from the point of view of investment potential, privacy and security implications, copyright issues, platform incompatibilities, NFT hacks (for example, transfer blocks, difficulty to archive revocation, linking and unlinking revenue streams to NFTs), forensic challenges, whether, and to what extent, an NFT can provide a guarantee of authenticity or ownership, and so forth.

And, of course, there is no shortage of economic analyses^{9,10,11,12} and

online reviews (<https://www.datawalllet.com/crypto/most-expensive-nft-s-and-collections-of-all-time>). No matter how worthy, these discussions avoid dealing with the central issue of whether the very notion of an NFT is conceptually flawed because the only part of the NFT that is nonfungible is the metadata which is valueless in any conventional sense. Even if the metadata is a completely accurate record it is, after all, only metadata. A reasonable response to NFT metadata, even if legitimate and uncontroversial, might be: So what?

By one recent account, the trading volume from for all recorded NFT transactions declined from US\$2.8 billion in 2021/2022 to US\$80 million by July, 2023, a decline of 97%!¹³ The energy required to mint 195,699 of these digital tokens with no apparent owners and no market share amounted to 27.8 kWh accounting for the production of approximately 16 thousand metric tons of CO₂. To repurpose Edsger Dijkstra’s criticism of the APL programming language, at this point NFTs have thus far proven themselves to be mistakes carried through to perfection. Proponents of NFT technology refer to their potential value in digitizing and protecting artifacts, securing artifact provenance, controlling access, contributing permanent availability, and so on. Perhaps so. But the concept of an NFT carries with it a similar investment smell as synthetic collateral debt obligations and credit default swaps—the odor of an unreliable engine for risky, potentially lethal investments is in the air.

We note that while art is still subject to the same tautological argument as NFTs—it has value because it is valuable—this value is nuanced and dependent upon many social, cultural factors, and economic factors that are not present in the same way for NFTs. Art can have material value (made of expensive materials), historical value, religious value, symbolic value, social value, and personal value derived from human experience. This nuance

is important to recognize. Rothko’s *Orange, Red, Yellow* may be considered high art by some, while those lacking an appreciation of abstract expressionism might consider it an unrefined field painting. In many ways, the art world has become a caricature of the free market. But if we are to consider art as a caricature of the free market, then there is a sense in which NFTs are really a derivative caricature of this caricature of the free market. Speculation abounds. Prices fluctuate drastically. Projects crop up and die immediately. Millions are won and lost. NFTs share this with the art world. However, the value of art is based on the artifacts and not accompanying metadata. Once again, the metadata (aka provenance) is important to determine the authenticity and ownership of the art, but it is the artifact alone (not the provenance) that has value. It is on this point that art and NFTs part company.

To oversimplify somewhat, two dominant commentaries on NFTs have emerged: One holding that NFTs (and cryptocurrency for that matter) represent our economic future, and another claiming that NFTs are but the latest example of meme culture economics that has led to an unsustainable economic bubble. In one of the tragic ironies of our time, it appears that both commentaries may prove to be right. NFTs illustrate that not everything that civilizations can do is worth doing. ■

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