What's the Hype All About?

Defining the Success Factors of NFT Sellers and Examining Expert Opinions of the Market

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I. Overview

I.I. Non-Fungible Token Background

A non-fungible token (NFT) is a unit of data stored on a decentralized electronic ledger – known as a blockchain – that certifies a specific file is unique, something that has previously been impossible for digital files. By designating files as unique, NFTs are used to develop digital "ownership" of any type of file. While NFTs have represented a drastic change in a variety of electronic spaces, one of its most impressive applications has been in the art world, where billions of dollars of digital pieces of art are circulated every year.

While NFTs have only gained popularity in the past year, the technology is already highly realized: by late August 2021, sales volumes on OpenSea, the largest NFT trading platform, reached $1.9 billion, over ten times the sales volume in March ($148 million).[1]

With each additional transaction, the NFT artist or person who minted the original NFT receives an automatic royalty. Unlike traditional fine art spaces where artists only see profit from their initial sale, NFT utilization presents a strategic opportunity for artists and sellers to capitalize on royalties and repeat profit from sales in secondary and tertiary markets.

[1] Elizabeth Howcroft, "NFT Sales Surge as Speculators Pile In, Sceptics See Bubble," Reuters, last modified August 25, 2021, https://www.reuters.com/technology/nft-sales-surge-speculators-pile-sceptics-see-bubble-2021-08-25/.

Due to the novelty of NFTs as an asset class, there are currently no official regulations on the buying and selling of NFTs as a security in the United States. Since NFTs have an impressively wide range of characteristics, uses, and formats, they have yet to be classified as a specific asset class and therefore have much more ambiguous regulations than more traditional securities or commodities. In addition, NFTs are typically only bought and sold using decentralized cryptocurrencies (typically Ethereum), which given the current relationship between cryptocurrencies and governments, only increases the difficulties in regulating and monitoring this new asset class. Furthermore, NFTs are subject to intellectual property regulations as they contain metadata describing the corresponding assets that they are bound to, making it significantly easier for original artists to profit off all depictions, copies, and displays of their work.

Unlike other asset classes on which limitations are set by regulatory agencies or third party rules, NFTs are governed by inherent technological features that are built into how they operate. To truly understand NFTs and the marketplaces where they are bought and sold, it is imperative to develop a fundamental understanding of how a blockchain works and how that allows for NFTs to be bought and sold.

Theoretically, NFTs sound like the ideal way for artists to eternally profit off of their ideas in a rapidly growing market; however, with high and rapidly increasing minting fees (cost to put an NFT in the market) and gas prices (per transaction cost), can any new or existing artist make profit in the NFT space? As NFTs are fully digital, with no physical product to back up, much of the surrounding speculative hype lies in the anticipation that a piece of artwork will appreciate in

the future. Thus, it is necessary to examine the relationship between the brand name/social media presence of NFT artists, the success of their artwork, and whether the market share is dominated by an "elite circle."

I.II. Hypothesis and Research Questions

The rise of non-fungible tokens and their digital nature have created a disturbance in the art industry that is relatively understudied, especially with respect to the success factors of NFT sellers. While proponents of NFTs claim the platform has "democratized" the world of fine art by seemingly removing the institutional barriers in conventional fine art markets, we believe a detailed analysis of NFT seller profiles, the regulatory environment, and NFT transactions will reveal that much of this "democratization" has been limited to the buyers of NFTs, not the sellers. Much like traditional fine art, we hypothesize that a small number of NFT sellers make a majority of the profits, and the profile of successful mintings will depend on several unique factors (tech, multimedia, blockchain, etc.) that are not applicable to the sale of traditional art.

In our analysis, we will endeavor to answer the following primary question: What quantifiable and qualifiable factors — such as social media following, method of generation, etc. — influence total revenue of a minted NFT, and how do those factors explain the current market share makeup? In the process of investigating this question, we will explore how social media following influences the total revenue from an NFT minting, how the involvement of traditional fine art institutions, such as Sotheby's and Christie's, have changed the market for NFTs, and what other quantifiable factors are associated with a successful minting.

II. NFT Pedagogy

For all the complexity that exists within the market for NFTs, the underlying technology behind NFTs is perhaps even more complex. It's important to note that a thorough understanding of blockchains, decentralized ledgers, decentralized autonomous organizations (DAOs), cryptocurrency, smart contracts, or cryptowallets is not necessary to participate in the NFT market (websites like OpenSea are designed to be easy to use). However, if we wish to truly understand the markets behind NFTs, developing a deep knowledge of how NFTs work is paramount. Just as traditional art relies on third parties like auction houses or governments to make regulations, facilitate sales, and enforce ownership, NFTs use technology – specifically the blockchain – to accomplish these things. Trying to understand NFTs without an understanding of what the computers are doing would be like trying to understand traditional art markets without knowing the role auction houses play. This paper hopes to provide that understanding to not only establish that our readers share a similar understanding of NFTs, but also to ensure we incorporate the technological complexities into our analysis.

II.I. Technological Underpinnings

The most important piece of technology that underlies every NFT is a blockchain. Developed alongside Bitcoin in a 2008 paper *Bitcoin: A Peer-to-Peer Electronic Cash System* by anonymous developer Satoshi Nakamoto, blockchains were created as a way to replace "trust" in online transactions with "proof," a fact that has major implications on the feasibility of

conducting commerce in an online setting.[2] In a transaction with physical cash, "trust" is simple: a seller needs to trust they are not accepting counterfeit currency from a buyer. Once cash is traded between parties, the seller does not need to worry about the buyer retroactively reversing their transaction to receive goods without having to pay because, after all, the seller already has the cash.[3] Additionally, there is no "double-spending problem" with physical transactions. Once you have spent your physical cash, there is no possible way to spend that same cash, meaning sellers do not have to worry they are accepting cash that has already been promised to somebody else. It is important to note that "trust" in this setting still comes from a third-party organization – in this case the state – and its ability to enforce counterfeit laws and continue to use and support the currency.[4]

As transactions move away from physical cash, trust becomes much more complicated. In an online transaction, the seller isn't receiving a physical asset, but instead, a piece of code, meaning many of the issues mentioned above persist. Now, parties have to worry about the transaction being hacked, the money being retracted after the fact, and the received money being spent somewhere else. Before blockchain, this problem required a trusted third party and a single centralized ledger, held by this trusted third party, to solve. This ledger was required to keep a "trusted" record of transactions, to settle disputes, and ensure people were not spending the same digital cash more than once. By definition, if anybody claimed a series of events that disagreed with the ledger, they were wrong and their record of accounts were ignored. These trusted third

[2] Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," Bitcoin, accessed November 18, 2021, https://bitcoin.org/bitcoin.pdf.
[3] Ibid.
[4] Sylve Chevet, "Blockchain Technology and Non-Fungible Tokens: Reshaping Value Chains in Creative Industries" (Master Thesis, HEC Paris, 2018), 1-73.

parties, typically banks or other financial institutions, were the sole arbiters of truth in online transactions. While this works in theory, when the "trusted" third party can no longer be fully trusted to provide an objective account of transactions (recent events like the Wells Fargo account scandal suggest this may be the case), this solution begins to fall apart.[5] Since the ledger is taken as gospel, if it is incorrect (whether through a mistake or fraud), transactions will not reflect reality and no other party is able to make a correction to this. It is clear that even with this centralized ledger, the same issues exist, just one level removed. Blind trust in a third-party is still present: this time, that the organization will provide an accurate ledger. Blockchain represents a significant breakthrough because it uses meticulous cryptographical verification, proof-of-work, and the law of large numbers to create a public record of online transactions that doesn't require blind trust.[6]

Blockchains were initially created for a very specific and narrow circumstances: a static cryptocurrency like Bitcoin. Blockchains, however, were quickly adapted into several smarter and more flexible platforms, the most notable of which is Ethereum. Ethereum relies on the same fundamental concept as Bitcoin – blockchain – but was designed to support many other types of code besides a simple "Person A sends X Bitcoin to Person B." One type of code which is particularly relevant to NFTs is known as a smart contract, which is "code that is embedded in a blockchain and run by miners", and theoretically allows for any program, software, or algorithm to run independent of a centralized server.[7] NFTs exist as smart contracts on the Ethereum

[5] Jack Kelly, "Wells Fargo Forced to Pay $3 Billion for the Bank's Fake Account Scandal", Forbes, last modified February 24, 2020, https://www.forbes.com/sites/jackkelly/2020/02/24/wells-fargo-forced-to-pay-3-billion-for-the-banks-fake-account-scandal/?sh=62f3e2fa42d2.
[6] Nakamoto,"Bitcoin: A Peer-to-Peer Electronic Cash System."
[7] Chevet, "Blockchain Technology and Non-Fungible Tokens."

blockchain which contain information on who has ownership of a digital file, much like an electronic deed. It is important to note that the actual content of a file is typically not stored on the blockchain (files can be stored "on-chain" but this is incredibly expensive and unnecessary), but rather in a separate repository known as an InterPlanetary File System (IPFS). When you purchase an NFT, you aren't buying the file, but rather a "receipt" that provides a certifiable proof of ownership and authenticity.[8]

Unlike fungible tokens where there is no effort to differentiate between any two tokens, non-fungible tokens are differentiated. Even if there exists two identical copies of the same file, the differences in their position on the blockchain would designate the two files as distinct, meaning they could still be bought and sold as if they were different.[9] The applications of "uniqueness" to digital art are obvious. With a medium as easily cloneable as digital files, it is essential that a potential buyer can distinguish between authentic pieces and forgeries. Much like physical art, distinguishing between authentic pieces and forgeries is incredibly important and can result in millions of dollars in value differences. Unlike physical art, it is easy to see which copy of an NFT you are receiving since only one copy can exist on the blockchain.

Fortunately, purchasing an NFT is much simpler than the technology that creates them. Platforms like OpenSea, NBA TopShot, SuperRare, Rarible, Solana, and many others provide a user interface much like eBay, where you can explore different NFT collections and place bids or buy-now offers for NFTs on a specific blockchain. Auctions on these websites work primarily in

[8] Ibid.
[9] Ibid.

two formats: an English auction (much like you would find at Sotheby's or Christie's), where ascending bids are placed and the piece is sold to the highest bidder within a certain time frame, or an open bid auction, where buyers submit public offers and the piece is sold to whichever offer the buyer choses, often without a fixed time frame (both auctions typically include a "Buy Now" price, which is set by the owner and, if met, will immediately end the auction).[10]

II.II. Regulatory Environment

There are two primary regulatory spaces regarding NFTs, reflecting the dual nature of the space: copyright laws, which treat NFTs as art (something to be owned for its own sake), and securities laws, which treat NFTs as an asset class (something that is bought and sold for financial gain). Despite dealing with the exact same object, these two spaces have distinct backgrounds and are enforced by different entities. Therefore, they should be investigated separately.

We start by exploring the laws regarding NFTs as art. To learn more about the laws regarding NFTs, we interviewed Jesse Halfon, a copyright attorney who specializes in virtual licensing law and assists NFT artists in protecting their creative work. Despite their relationship to cryptocurrencies, which are notoriously separated from governmental interference, NFTs have a very close and "common-sense" relationship with licensing and copyright law. According to Halfon, with a few notable exceptions, NFTs follow the exact same intellectual property regulations you would see in any other piece of media, including both copyright and licensing

[10] Doug Tygar, "Auction Types," Usenix, last modified July 22, 1998, https://www.usenix.org/legacy/publications/library/proceedings/ec98/full_papers/harkavy/harkavy_html/node2.html.

laws. Just like you cannot copy or profit off the logos or designs of a traditional brand, most NFT brands have the same protection (at least in theory).[11] This often changes, however, from project to project. When you purchase an NFT, depending on the specifics of the minting and the platform you purchase it on, some projects come with no licensing to the underlying art, some sell a personal use license (you can use the art for your own use with no financial gain) with the piece, while others (notably CrypToadz) sell a complete creative license of the art you purchase, meaning you can use the art as if you created it yourself.[12]

Interestingly, Halfon says what makes NFTs unique has little to do with any concrete difference in the license or fair use laws, but rather a pervasive "copy culture" among NFT creators and buyers where laws about fraud, illegal copying, and fair use are actively ignored.[13] For each successful NFT collection, there are likely dozens of illegal copies attempting to make money on the tailwinds of the success of the original.

As mentioned before, NFTs are more than digital art: they represent a significant and growing source of speculative investment in the digital economy. As the amount of money invested in digital art increases, increased attention of NFTs as securities will follow. A security, as defined by the Securities and Exchange Commission (SEC), is any "note, stock… certificate of interest or participation in any profit-sharing agreement, certificate or subscription, or investment contract."[14] This definition is purposefully vague so it can encapsulate any asset which is owned

[11] Jesse Halfon (copyright attorney), in discussion with Bryce Grove, October 2021.
[12] Ibid.
[13] Ibid.
[14] U.S. Congress, "United States Code: Securities Act of , 15 U.S.C. §§ 77a-77mm (1934)," Library of Congress, 1934, https://www.loc.gov/item/uscode1934-001015002a/.

for the primary purpose of generating income or capital gains. Art, both digital and physical, does not cleanly fit into any of the categories that define a security, and as a result, it has a confusing relationship with regulation despite its increasing use as a speculative investment. The digital nature of NFTs only adds an additional layer of confusion about the current regulation, but there are several concrete characteristics which can eliminate much of the confusion.

According to Halfon, to be regulated as a security by the SEC, an asset needs to satisfy three major characteristics. First, an NFT's status as a security depends on whether or not it is advertised as an investment. It is often thought that most buyers of digital art are primarily interested in the capital gains associated from owning these pieces.[15] To avoid increased scrutiny, creators rarely mention any financial gain, cash flows, or other income associated with owning their pieces, even if they exist and are large drivers of demand. Next, if an NFT can be fractionalized and sold on a secondary market, it would likely fit the definition of a security and would be regulated as such. This point has recently garnered some increased attention, as websites like fractional.art allow investors to buy, sell, and mint shares of NFT. Lastly, the increasing presence of "crypto partnerships," hedge funds, and collaborative NFT portfolios would also attract increased attention from regulatory agencies.

Despite the connections to securities law, there has yet to be a single piece of legislation and/or SEC investigation specifically targeting NFTs or online art, even in the face of numerous well-known scams.[16] The reasons for this are quite simple: art has historically had a lax

[15] Halfon, interview.
[16] Ibid.

relationship with securities regulation and the law has not kept up with the rapidly changing technology. While NFTs are now a well-known and lasting feature of the contemporary art scene, they were an incredibly niche and small market even just one year ago. Blockchains were only developed in 2008, and Quantum, considered by most to be the first NFT, was only minted in 2014. NFTs, which represent a nearly $9.3 billion market as of October 2021, only generated $110 million in total sales in all previous years combined.[17] With the influx of attention and money entering the NFT space in only the last few months, it is no surprise government regulation has lagged behind. Halfon believes this will quickly change and the NFT space will begin to see regulation more in line with its use as a security in the coming years.

III. Quantitative Analysis: Regression on Characteristics of Seller Profiles

III.I. Data and Variables

In order to analyze the success factors of NFT sellers, we constructed an original dataset featuring the characteristics of NFT sellers' profiles. Each observation in our dataset represents a NFT seller on the OpenSea marketplace. According to an October 10, 2021, article published by *The Generalist,* "since its founding in 2017, the NFT marketplace has grown to become the undisputed leader in the space with a share that exceeds 97% and volume 12x that of its closest rival."[18] We believe that choosing our sellers exclusively from OpenSea sufficiently represents a

[17] "The History of NFTs and How They Got Started," Portion, last modified September 2021, https://blog.portion.io/the-history-of-nfts-how-they-got-started/.
[18] Mario Gabriele, "OpenSea: The Reasonable Revolutionary," The Generalist, last modified October 10, 2021, https://www.readthegeneralist.com/briefing/opensea.

sample of prominent NFT sellers, and in constructing our dataset, we decided to focus on the top 100 sellers on OpenSea, determined by all-time volume of sales (measured in Ethereum) as of October 12, 2021.

Most of the variables were scraped from the OpenSea website (https://opensea.io/). Our dataset features 14 variables: the name of the seller, description, their ranking, category (e.g., art, collectibles, virtual worlds, utility, sports, etc.), the year of the seller's first sale, number of items (in thousands), number of owners (in thousands), total volume traded (in thousands of Ethereum), floor price (in Ethereum), the average price of the seller's collection (in Ethereum), the number of the seller's Twitter followers (in thousands), whether the seller uses an algorithm to create their collection, whether the profile features a collaboration of different artists' works, and finally, whether NFTs by the seller have been featured in a traditional art auction, such as those held by Sotheby's and Christie's. In order to obtain the dummy variables (e.g. featured auction, algorithmically generated, etc.), our team had to perform web searches and use the resulting information to make a decision about whether a given seller did or did not possess the characteristic in question. There were times when certain sellers were missing data, i.e. floor price, average price, etc. In this situation, we used imputation of the average to fill in the missing data, as it would not have been appropriate to remove observations altogether because we needed to preserve the top 100 sellers. For an in-depth view of the variables used in this analysis, please see the Codebook associated with this dataset, which can be located in the Github repository along with the actual dataset: https://github.com/calleighsmith/NFT_sellers.

III.II. Methodology

Our quantitative analysis features a multiple linear regression model. The benefit of using an ordinary least squares (OLS) model such as this one is that it provides interpretable results. Our goal for this statistical research component is to be able to quantify the relative importance of our variables to identify which factors, if any, contribute to the success of NFT sellers. Therefore, our regression analysis focuses on inference rather than prediction. Special attention will be devoted to interpreting p-values of the model coefficients, reporting confidence intervals, and ranking the relative magnitude of the impact of the variables on the response variable, which is the sales volume in thousands of Ethereum. In order to fit this model, we used R, the leading statistical programming language.

The model formulation is as follows:

$$\begin{aligned} sales\ volume_i =& \beta_0 + \beta_1 \times\ no.\ items_i + \beta_2 \times no.\ owners_i + \beta_3 \times floor\ price_i + \beta_4 \times average\ price_i \\ &+ \beta_5 \times no.\ Twitter\ followers_i + \beta_6 \times year\ first\ sale_i + \beta_7 \times \mathbb{1}(algorithmically\ generated_i = yes) \\ &+ \beta_8 \times \mathbb{1}(artist\ collaboration_i = yes) + \beta_9 \times \mathbb{1}(featured\ auction_i = yes) \\ &+ \beta_{10} \times \mathbb{1}(category_i = art) + \beta_{11} \times \mathbb{1}(category_i = sports) + \beta_{12} \times \mathbb{1}(category_i = collectibles) \\ &+ \beta_{13} \times \mathbb{1}(category_i = virtual\ worlds_i) + \beta_{14} \times \mathbb{1}(category_i = trading\ cards_i) + \beta_{15} \times \mathbb{1}(category_i = utility_i) \\ &+ \epsilon_i \end{aligned}$$

where *i* represents an individual seller on OpenSea and $\epsilon_i \overset{i.i.d}{\sim} N(0, \sigma^2)$.

We used statistical methods to properly validate our model. These methods include ensuring independence of the sellers in our dataset (our unit of observations), transforming variables if they do not have a linear relationship with the response variable, preventing multicollinearity of seller characteristics (our independent variables), checking that the model residuals are normally

distributed, and lastly, empirically measuring homoscedasticity. Upon investigation, these assumptions appeared to be reasonably satisfied.

III.III. Results

The results of our multiple linear regression model can be found on the following page, including coefficient estimates, their 95% confidence intervals, and their p-values. Statistically significant variables are those with a p-value of <0.05 and are bolded for ease of identification.

Characteristic	Beta	95% CI[1]	p-value
Category			
art	—	—	
collectibles	25	-13, 64	0.19
new	14	-92, 121	0.79
sports	17	-62, 96	0.67
trading cards	15	-44, 73	0.62
utility	6.2	-45, 57	0.81
virtual worlds	-8.2	-60, 43	0.75
No. Items	0.00	-0.02, 0.01	0.63
No. Owners	0.24	-0.24, 0.72	0.32
Floor Price (Ethereum)	-0.44	-0.72, -0.16	**0.002**
Year of First Sale	-16	-28, -3.2	**0.014**
Average Price (Ethereum)	3.3	1.6, 4.9	**<0.001**
No. Twitter Followers	-0.05	-0.19, 0.08	0.43
Algorithmically Generated?			
No	—	—	
Yes	9.9	-22, 42	0.54
Collaboration of Artists?			
No	—	—	
Yes	20	-17, 57	0.28
Featured in a Traditional Auction?			
No	—	—	
Yes	77	42, 112	**<0.001**

[1] CI = Confidence Interval

Table 1: Regression Analysis Results

III.IV. Discussion

Based on the model output, several variables are statistically significant, namely, floor price, year of first sale, average price, and featured auction. Given that multiple linear regression models are good choices for interpretable results, we can generalize the effects of our model's significant variables on the response, or a seller's total sales volume.

The first significant variable is floor price, which is the lowest price for a collection of items. Holding all else constant, for an increase in floor price by 1 Ethereum, we expect the seller's total sales volume to decrease by 0.44 Ethereum, on average. This suggests that there is an inverse relationship between floor price and total sales volume such that collections with cheap NFT offerings tend to generate more total revenue. Perhaps buyers look for inexpensive NFTs because they simply want to be involved in purchasing this new art form but they are not committed to buying some of the pricier items in a collection.

Moreover, the year of a seller's first sale on OpenSea is statistically significant in our model. Holding all else constant, for an increase in 1 year, we expect the seller's total sales volume to decrease by 16 Ethereum, on average. This outcome aligns with traditional art markets, as it establishes that sellers with a "long-standing" presence on OpenSea – though OpenSea was founded relatively recently, in 2017 – have amassed more sales volume over this time. New sellers might generate hype and make sales, but it takes time for their sales volume and community to grow. For NFT sellers, wealth is not generated overnight.

The next significant variable in our model is average price. Holding all else constant, for an increase in average price by 1 Ethereum, the total sales volume is expected to increase by 3.3 Ethereum, on average. This perhaps is not very surprising, as it makes sense that sellers with pricier collections overall have larger sales volumes.

Whether an NFT seller has had their work featured in a traditional art auction such as at Sotheby's or Christie's has a large impact on their sales volume. In fact, the coefficient for this variable (77) is both positive and high in magnitude compared to other variables in the model. Holding all else constant, compared to an NFT seller who has not been featured in a traditional art auction, one who has been featured is expected to have a total sales volume that is 77 Ethereum ($354,782.89 USD) higher, on average. Therefore, for NFT sellers, getting their work in a physical and reputable art auction would be extremely beneficial to the value of their collections.

An examination of the category variable shows that compared to the baseline category art, the other categories, with the exception of virtual worlds, have a more positive effect on total sales volume. We inferred this by examining the coefficients' associated with category sign and magnitude; positive signs and magnitudes indicate that compared to NFT sellers who categorize their collection as art, sellers in other categories tend to have higher total sales volumes. On the other hand, negative signs and magnitudes indicate that sellers in other categories tend to have lower total sales volumes. This seems to suggest that NFTs that are most akin to traditional art are not as lucrative for sellers as collectible, new, sports, or trading cards, or utility NFTs are.

IV. Qualitative Analysis

IV.I. Case Studies

IV.I.I. Beeple

While much of the existing literature on art markets — including our research hypothesis — posits that existing players in the art world tend to fare better in terms of pure profit margins and notoriety, the case of Mike Winkelmann, known in the NFT world as "Beeple," presents a stunning alternative to the old-guard model of art sales.

Beeple is a digital artist who makes a living selling the absurd — from comically repulsive images of former Presidents to niche references to the inner workings of Internet meme culture – Beeple's art is both as hilarious as it is confusing to its loyal core of supporters.[19] Regarding supporters, Beeple sports an impressive 2.2 million followers on Instagram alone: even if his work does not appeal to everyone, it clearly strikes a chord with the masses. With this Internet cult-style of fame though, Beeple has managed to achieve modern artist stardom in the digital age, despite having maintained a low-profile profile for most of his career. Winkelmann explains how he started out his career in website design but quickly focused his attention on creating a piece of artwork every day. He fittingly called his project *Everydays.* While his work initially started off with no significant audience, he quickly began growing his fanbase, eventually

[19] Mickey Rapkin, "'Beeple Mania': How Mike Winkelmann Makes Millions Selling Pixels," Esquire, last modified February 17, 2021, https://www.esquire.com/entertainment/a35500985/who-is-beeple-mike-winkelmann-nft-interview/.

receiving attention from creative directors at Louis Vuitton, for example.[20] While his newfound fame excited him, he had not found a way to sell any of his digital artwork let alone a monetization design. Traditional canvas artwork seemed to operate on a different plane than the type of work Beeple was creating.

Winkelmann began hearing chatter about the potential of selling digital artwork on platforms directly tied to blockchain technology. He quickly forayed into Nifty Gateway and started selling his first pieces for over $60,000. Suddenly, a burgeoning artist who started to find success in some of the stranger parts of the Internet had netted a significant profit through the world of cryptocurrency, blockchain, and NFTs. Winkelmann has even diversified; in an attempt to help ground digital art in a physical backing, he has started creating luxury goods that pair with sold digital art and that are sent to those who purchase the actual piece. [21]

Conceptually, Winkelmann has turned digital art sales into one based on tried-and-true methods of selling art by creating a physicality to these ethereal online transactions. These days, Winkelmann continues *Everydays* and has recently sold an NFT for $69 million.[22]

While there is something to be said about celebrity status following you to your first art sales on OpenSea or Nifty Gateway, Beeple is a fascinating case study into the so-called democratization effect. While he did have some sizable internet following, his primary profession of digital

[20] Ibid.
[21] Rapkin, "'Beeple Mania': How Mike Winkelmann Makes Millions Selling Pixels."
[22] Michela Moscufo, "Digital artwork sells for record $69 million at Christie's first NFT auction," NBC News, last modified March 11, 2021, https://www.nbcnews.com/business/business-news/digital-artwork-sells-record-60-million-christie-s-first-nft-n1260544.

artmaking is what carried him to fame and netted him enormous returns on his works. Perhaps there is something more to be understood in the world of social media art portfolios, digital images that tilt towards the obscure, and new platforms that help said artists reach an audience willing to pay a hefty amount for blockchain-verified proof that they do, in fact, own the newest Beeple.

IV.I.II. Snoop Dogg and @CozomoMedici

Celebrity status seems to prove advantageous to most burgeoning NFT sellers. While many have forayed into the growing NFT space, it would be fruitful to analyze the NFT story of award-winning entertainer and rapper Snoop Dogg.

In April of 2021, Snoop released his first NFT collection on Crypto.com titled "A Journey with the Dogg." The collection, only available for 48 hours, featured exclusive video and music from the man himself.[23] Snoop tweeted "108k bid on this piece ! Here we go! 20mins n counting !"[24] In his first-ever NFT drop, Snoop managed to sell a piece titled *Death Row* for over $100,000.[25] This is a critical example of how celebrity status often elevates the price and valuation of NFT artwork. While evidence may not suggest that the piece of Snoop Dogg on the electric chair (as featured in *Death Row*) might not have been worth upwards of $100,000, the evidence does seem

[23] "Snoop Dogg Announces the Release of His First NFT Collection: 'A Journey with the Dogg'," PR Newswire, last modified March 30, 2021, https://www.prnewswire.com/news-releases/snoop-dogg-announces-the-release-of-his-first-nft-collection-a-journey-with-the-dogg-301259014.html.
[24] Snoop Dogg (@SnoopDogg), "108k bid on this piece! Here we go! 20mins n counting !," Twitter post, April 4, 2021, https://twitter.com/snoopdogg/status/1378839990034001927?lang=en.
[25] Max Tenenbaum, "Snoop Dogg sells NFT for over $100,000 USD," CultMlt, last modified April 5, 2021, https://cultmtl.com/2021/04/snoop-dogg-sells-nft-for-over-100000-usd-a-journey-with-the-dogg-auction/.

to indicate that subjective factors related to the maker of the NFT and the significance of the piece in relation to Snoop Dogg caused the piece to be valued higher.

However, the Snoop Dogg case study presents interesting data on the success of NFT sellers. In late September of 2021, Snoop tweeted "I am @CozomoMedici." Although seemingly innocuous, this tweet essentially claimed that Snoop Dogg was the identity behind the secretive NFT whale associated with the Twitter Account @CozomoMedici (a reference to Cosimo de Medici, the famed Italian banker and politician).[26] At the time of his tweet, @CozomoMedici had a wallet filled with NFT collectibles valued at over $17 million and by Snoop's tweet linking himself to this account, it not only established Snoop Dogg as a bigger NFT player than people gave him credit for, but also highlighted a case study as to how someone, even without big-name celebrity status — or any identity known whatsoever — could amass 38,500 Twitter followers and become a big presence in the NFT space.[27]

Here's what this evidence indicates: while there are some like Beeple, who through consistency and a finger on the pulse of virality on the Internet can dominate the NFT space even without pure celebrity status, the vast majority of rapidly successful NFT sellers retain some status prior to their emergence on NFT selling platforms. By this, we posit that while OpenSea might feature multiple collections by seemingly unknown artists outside of the NFT space, the fastest NFT sellers to obtain high valuations of their artwork or those who experience immediate success are likely drawing upon a social media following and fanbase external to the NFT art world.

[26] Chris Morris, "Snoop Dogg reveals himself as NFT kingpin Cozomo de' Medici," Fortune, last modified Sept 22, 2021, https://fortune.com/2021/09/22/snoop-dogg-cozomo-de-medici-nfts-crypto-wallet/.
[27] Ibid.

That being said, @CozomoMedici presents a notable alternative; while less industry dominant than Beeple, the account was able to boast a valuable NFT wallet and gain a sizeable social media following from NFT work (the account was only created in August of 2021, therefore gaining over 30,000 Twitter followers in under two months). However, the mere association with, first and foremost, a celebrity, and secondarily, a celebrity with a successful history of NFT collection sales has been enough to bring @CozomoMedici's following to over 100,000 Twitter followers just one month later.

IV.I.III. Bollywood and Knowing Your Market

While the NFT craze might seem distinctly local, the move to NFT auction platforms is distinctly global. This point is underscored most vividly with the example of India, where 15 million of the world's near 100 million cryptocurrency users are located.[28] India is a prescient example of NFT valuation and its tie-in to 'hype' factors such as celebrity status and following as everyone from famed cricketers to Bollywood stars seem to be moving into the space.

Recently, Bollywood superstar Amitabh Bachan decided to enter the world of NFTs by launching his first NFT collection in partnership with BeyondLife.club. In layman's terms, Bachan fills the same niche that American actor, Leonardo Dicaprio, taps into for American markets. With such a powerful celebrity, it is no surprise that Bachan's collection auctioned for nearly $1 million as an

[28] Sethu Pradeep, "From Cricketers To Bollywood: Will NFT Marketplaces Become The New Insta For Indian Celebrities?," Inc42, last modified Oct 14, 2021, https://inc42.com/buzz/will-nft-marketplaces-become-the-new-insta-for-indian-celebrities/.

aggregate — the most valuable auction ever in India. Just a few days after launching his collection, a recording of Bachan reading his father's poem went for over $750,000.[29]

The inherency of why these collections and pieces go for such sums seems innately clear: Bachan is famous and people tend to pay exorbitant amounts to tap into that. However, in a market where 15% of global cryptocurrency users are stationed, for one man to break Indian auction records highlights that the most dominating factor could, in fact, be social media following and celebrity status. In the world of social media, the best barometer of one's fame is their following. Bachan, with about 29 million on Instagram, clearly has that and has evidently used his following as a vehicle to drive up value for his collectibles.

For NFT sellers, the Bachan example is clear: know your niche. Most of his NFT collection featured old film memorabilia and material goods from Bachan's upbringing. The people predominantly purchasing his goods were fans who wanted a piece of Bachan. Therefore, when comparing Bachan to Beeple, either tap into what your fans want or what the Internet wants: both are bound to have willing buyers.

IV.II. Expert Opinions on the Market

[29] Shubham Raj, "Amitabh Bachchan's NFT collection auctioned at record $1 million," The Economic Times, last modified Nov. 5, 2021, https://economictimes.indiatimes.com/markets/cryptocurrency/amitabh-bachchans-nft-collection-auctioned-at-record-1-million/articleshow/87539323.cms.

We conducted multiple rounds of qualitative interviews to capture industry-specific insights, fine tune the interpretation of our regression, and take note of potential model improvements. The following section shall deep dive into recurring majoring themes across interviews with three major objectives in mind:

1. We would like to determine factors outside our regression model that potentially correlate to sales volume and the covariates. The reason why causal interpretation usually cannot be determined from regressions in the real world, and why causation is not the same as correlation, is because covariates tend to be indicators of factors outside the model that also affect the dependent variable. The interviews we conducted do a particularly good job of parsing through the extraneous factors that affect the number of followers an NFT artist has.
2. We would also like to determine cases of multicollinearity, when covariates are highly correlated with each other, which renders it difficult to isolate the effect of each covariate (e.g., social media followers and whether or not an artist has been featured on an auction) on the dependent variable sales volume.
3. Finally, we would like to distinguish what makes the NFT space unique compared to traditional art markets and add qualitative insights to the future development of this market.

Prior to each interview, we requested and received permission to record. All interviewees have agreed to go on the record. In total, there were six interviewees, including: Beverly McIver, Bill Fick, John Caccavale, Nicole Sales, Jesse Halfon, and Ryan Kuo.

First and foremost, an artist's follower count encompasses multiple different factors that a quantifiable model would find hard to capture precisely, and this holds true for both NFT and traditional artists. For example, follower count is often influenced by unique branding, community (i.e. how engaged a following is with the artist), and whether or not the art style is "first" to the market.

According to Beverly McIver, contemporary artist and Duke Esbenshade Professor of the Practice of Visual Arts, unique branding is important because it makes an artist memorable: "To learn your craft, to perfect it, whether [you are] a painter, photographer, filmmaker or musician, you're building your brand," she said. "You want to have a voice in your craft that makes you different. Visually you see it show up in the artwork."[30]

Social media, then, exists as a tool for artists to visually link their pieces in a condensed format, network, project their voice, engage with their audience and establish community.

"I know a lot of artists who have gotten good things to happen through social media," said Bill Fick, printmaker and Visual Art Professor at Duke University, "I mean I have people who contact me [about my work] … [social media] doubles as being promotional."[31]

These insights hold particular importance because they indicate that the price of artwork is not simply a function of the numbers, but also a function of how well an artist is able to connect with

[30] Beverly McIver (contemporary artist), in discussion with Emily Xu, October 2021.
[31] Bill Fick (artist and professor), in discussion with Emily Xu, October 2021.

his or her audience, the artist's online interpersonal skills, and how persuasive the artworks' messages are. This suggests that an artist whose social media primarily consists of bought followers, or followers who are not as engaged with the artist, would not perform as well in sales as artists whose followers are engaged. It should be noted that soft, qualitative factors such as artist likeability are hard to quantify and data such as private, direct messages to/from followers are not available in the public domain, which makes it hard to incorporate "engagement" in a regression.

Nevertheless, in the NFT space, similar observations hold true. According to Nicole Sales, Business Director of Digital Art Sales and NFTs at Christie's Auction House, it is too early to talk about major trends, but in her experience, the best performing NFTs have been characterized by three factors: community, the primary market derived from the artist, and the natively digital aspect of the asset.[32]

"What we've found in the short period of time that we've done this," said Sales, "is that artists that have existing communities really performed the best. They're the ones that have their own social media following, they have their own brand, their own persona... they're already popular with their audience, and Christie's is just amplifying their voice on its platform."[33]

From Sales's quote, we can derive two insights. First, there is a high probability of collinearity between the number of Twitter followers and whether or not an NFT artist has been featured in

[32] Nicole Sales (Business Director, Digital Art Sales and NFTs), in discussion with Emily Xu, October 2021.
[33] Ibid.

an auction. Auction houses such as Christie's select for already established artists with large followings to feature them in auctions, and it is likely that the auction itself brings about even more followers for the artist. This makes it hard to isolate the individual effect of an auction feature versus the effect of the following count. However, it is both plausible and likely that established artists (and potentially new artists) would still benefit greatly from being featured in an auction. Second, "community" seems to be a main factor in the NFT space, and like the traditional art space, this exists outside the model and correlates with both artist social media follower count, demand, and the price of an NFT piece.

As for the second insight, it seems that working with the artist in the primary market as opposed to in the secondary market as well as working with artists who can mint under their own name yields more success in terms of price from the perspective of auction houses.

"We've done a few secondary sales for certain projects such as Cryptopunks, but I think when we're working directly with the artist, it makes it more authentic," Sales said. "I think the most successful artists are the ones who also understand the tech. There are companies that do the minting for artists, but that is less authentic. It's nice when the artists can mint their own piece because then when you're looking at the blockchain it says it's originally from the artist as opposed to some random company that did it on the artist's behalf."[34]

[34] Sales, interview.

The digital nature of NFTs makes trust and authenticity even more imperative than before. Buyers need to know that what they are buying is the real version by the artist, and auction houses working directly with said artists is a signal of said authenticity.

One factor that contributes to the success of an NFT artist and the price of their works that does not necessarily apply to traditional art markets is the natively digital aspect of an NFT.

“The actual asset is made digitally as opposed to just an NFT pointing to something else that doesn't have to be an NFT,” Sales said. “I think you can't just make an NFT out of anything and that adds value... the actual asset itself that the NFT is pointing to has to have utility, has to have value, and has to be interesting enough that people want it in and of itself.”[35]

Some artists add exclusive club memberships to their NFTs, while others add tangible assets. In some cases, artists also use the blockchain technology within the artwork itself.

“So maybe it's something where the art continuously changes over time or you know based on current events or based on life events,” Sales said. “There's a lot of dynamic attributes that artists can add if they are using blockchain to enhance the actual art that they're creating, and those are the projects that are the most successful, the most interesting, and that are going to make this category unique. You're not just printing out something that you made in Photoshop.”[36]

[35] Ibid.
[36] Ibid.

Ultimately, the NFT space is still relatively new, but like any other industry, becoming a successful NFT artist takes strategic work and is not as simple as what conventional media makes it out to be.

"I think it's hard to break in, just like it's hard to break in and become famous and popular in any industry," Sales said. " In order to be successful you have to build your own brand, network with the crypto community, and create a project that is immersive. There are creative ways to develop hype, and it's a little bit of marketing and a little bit of artistic talent."[37]

However, after an NFT artist breaks into the industry, "price hype" can become a separate factor that influences price. As the price of an NFT art piece increases, speculators may start to believe that the price would go up even further and buy in just to sell in the short term. These speculators then also contribute to an artist's following.

"[If we] talk behavioral finance, I think there's a lot of F.O.M.O. (fear of missing out)," said Professor John Caccavale, Executive Director of the Duke Financial Economics Center. "Nothing's worse than not being rich than seeing your neighbor get rich."[38]

So far we can summarize the covariate social media following as indicators of several factors, some within the model (i.e., how long the artist was in the NFT market, whether or not their art has been featured in an auction) and some outside of the model (i.e., unique branding,

[37] Ibid.
[38] John Caccavale (economist), in discussion with Emily Xu, October 2021.

established community, perceived authenticity, perceived future ability to increase in price, and bragging rights). NFTs' heavy reliance on subjectivity and buyer perception leads many to remain skeptical, including Caccavale.

"I see too many similarities in what's happening in the NFT sphere that remind me of other things [like Pet Rocks]," Caccavale said. "I think, if the market corrects itself, which it will, the people who need money again just like [in the financial crisis of 2008], the start of COVID paranoia in March 2020, 1994 with Mexico, 1997 with Asia, and whenever markets crash and people need to sell stuff."

Therefore, by investing in NFTs, investors may be poised to lose money should the market correct itself. Nevertheless, some view NFTs as a neutral instrument that has pros and cons for all.

"[NFTs] are neither good nor bad," said NFT artist Ryan Kuo. "They are bad because they are a capitalist tool. They are contributing to destructive processes and environments, and they are allowing the investor class to carve out their space on the blockchain… [On the other hand,] many artists [who did not get appreciation via traditional mediums] are finally getting noticed."[39]

[39] Ryan Kuo (NFT artist), in discussion with Kishan Gandham, October 2021.

V. Conclusion

V.I. Limitations

Our quantitative analysis was limited by our data. There are a few limitations to consider. First, due to the fast-changing NFT market, OpenSea rankings change daily. Therefore, our data represents a snapshot of the top 100 sellers at the time that the data were collected (October 12, 2021). Less than a month later, some of the seller rankings and metrics (e.g. number of Twitter followers, number of items, average price, etc.) have already changed. Second, missing values were imputed using the mean value, which allowed us to make use of all observations in our dataset and maintain our sample size of the 100 top sellers when creating our model. We believe that this was the best way to deal with missing data in our analysis, but it is necessary to understand that the imputed missing values are, by nature, imprecise. Third, our dataset focuses only on the top 100 NFT seller profiles by volume, which limits the generalizability of our analysis. Our findings from our quantitative analysis can really only be applied to high-profile NFT sellers rather than smaller, up-and-coming sellers in the space. However, our qualitative analysis can be generalized to smaller players in the NFT arena. Fourth, there is the issue of multicollinearity and the fact that many factors that affect follower count could not be included as covariates due to data restrictions or the infeasibility of measuring subjective factors such as "community." It will be hard to determine the precise magnitudes of the effect of each covariate due to the above limitations.

Qualitatively, our interview sample size was small. While our regression pointed to specific variables, our interviews zeroed in on the notion that social media following and artistic quality were the determining factors of value. Largely, more refined findings ought to have more interview subjects that span from NFT artists to regulators to academics to economists. Our qualitative findings from interviews and case studies might be more profound with more interviews conducted and use-cases researched.

V.II. Future Directions

Our analysis creates many opportunities for further research. First, expanding the data to include more NFT sellers and more variables would be a major undertaking but also one of the first of its kind. Our dataset provides a satisfactory starting point for a NFT quantitative analysis given the resources available to us. As many of the variables in our dataset were collected through search queries, data collection proved to be a timely and tedious process. Given the short-term span of this project (a single academic semester), we needed to construct an accurate, workable dataset with sufficient time to analyze it properly and derive insights.

Additionally, there is concern about multicollinearity between NFT fame and price. In this scenario we have a strong case for bidirectional causality where more followers can cause higher prices, but higher prices can also cause more followers. If we would like to isolate the direction, we would need to run 2 models with instrumental variables, one as a proxy for fame (to measure the effect of following on price) and the other as a proxy for price (to measure the effect of price on following). However, this may be infeasible due to the opacity of data collection and the

conditions that need to be met to find valid instruments. It would be interesting however, to see the point in time where the following of each artist took off exponentially — that might be an indicator of when price or some other sort of attention-grabbing phenomenon caused an artist's following to explode. However, this might pose difficulties because there are multiple exogenous factors such as press coverage, and it would be hard to pinpoint or define exactly when the "takeoff point" is.

We wish that we had more time to conduct additional interviews and adjust our model based on the interview feedback. While our interviewees were carefully selected to show a diversity of perspectives (artistic, economic, legal, etc.), comparing competing viewpoints could add to the robustness of our analysis. Additionally, most of the interviews were conducted qualitatively and in conversation, but we considered a quantitative interview approach where interviewees would provide empirical ratings to quantify observations and sentiments. However, we felt that our regression analysis was sufficient for presenting a quantitative approach to our research and preferred the descriptive analyses that our interviewees could provide. Future studies might consider the quantitative interview approach.

Since the technology and regulatory environments for NFTs are ever-changing, it would be wise for future researchers to stay up-to-date on these disciplines and how they are impacting the NFT space. As Halfon expressed in his interview, it is a matter of time before governmental agencies such as the SEC become more involved in this new asset class, which could have major implications for the market for NFTs.

V.III. Summary and Final Remarks

Given our original research question surrounding the factors that contribute to an NFT's value and its total revenue, our data and findings point to a few different considerations. The data suggests that the lower the floor price, the earlier an NFT seller got their start on OpenSea, and whether or not the piece was featured in a traditional auction are some of the more interesting and significant drivers of value. Interviews and case studies seemingly present a broad-strokes understanding of NFT value, suggesting that the duality of social media presence and artistic craft are what accelerate NFT works to higher valuations and fame. Perhaps it is a combination: if NFT artists are coming from a different medium and bringing their fans to OpenSea, maybe when they got their start is not as important. More important to them is leveraging their existing fans to purchase items from their collections. Separating those cases, for humble artists trying to get recognized via NFT collections on OpenSea, it is better they foray earlier rather than later and work on refining their artistic craft, community, brand, and social media presence. These, according to various NFT players, are the best drivers of valuation and revenue. Regardless, the world of NFTs is rapidly evolving, deeply convoluted, and tethered to the Internet: our findings simply confirm the obvious. At least for now, NFTs are here to stay.

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