The Impact of Financing on Multi-sided Platforms: Evidence from the Digital Asset Market

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Introduction

- Multi-sided platforms are ubiquitous
- Platforms typically monetized through commissions or fee
- How to grow the platform a key question
- **Can availability of financing lead to platform growth?**
  - **Focus on the Digital Asset market (non-fungible tokens)**

Introduction

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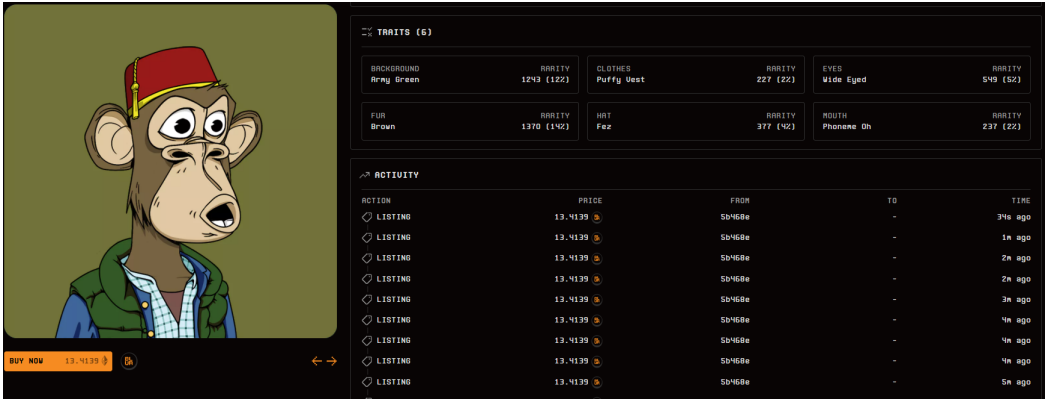
Research Questions

- How does availability of financing **impact market outcomes (quantity, prices, revenue, etc.)** for a collection of NFTs?
  - Does the effect vary across different types of NFTs and consumers?
- Can financing be used to **grow the platform** by increasing the user base in a competitive market?
- How do **supply- and demand-side responses** contribute to the change in sales and other outcomes?

Why Digital Asset Market?

- Large market with capitalization of $2.3 trillion.
- Rapid growth between 2023 and 2024
  - 95% increase in user base
  - 89% increase in market value
- Include artwork, collectibles, virtual real estate etc.
  - Recorded on blockchain technology using NFTs (Non-Fungible Tokens)
  - Each NFT is unique and can be traded on multiple platforms
- Growing market where all transactions happen on a few platforms
  - Top two platforms (Blur and OpenSea) have over 80% market share
  - We observe transactions on both platforms

Example of an NFT - Bored Ape Yacht Club Collection



Relevant (Nascent) Literature

- Product-level financing (BNPL)
  - **Akana and Doubinko 2023, deHaan et al. 2024, Di Maggio et al. 2023, Kumar et al. 2024, Guttman-Kenney et al. 2023, Keil and Burg 2023, Desai and Jindal 2024, Ma and Zhou 2024**
- Peer-to-peer lending
  - **Butler et al. 2017, Balyuk 2023, Vallee and Zeng 2019, Lu et al. 2022**
- Digital assets and NFTs
  - **Nadini et al. 2021, Kong and Lin 2021, Vasan et al. 2022, Franceschet 2021, Oh 2023, Kapoor et al. 2022**

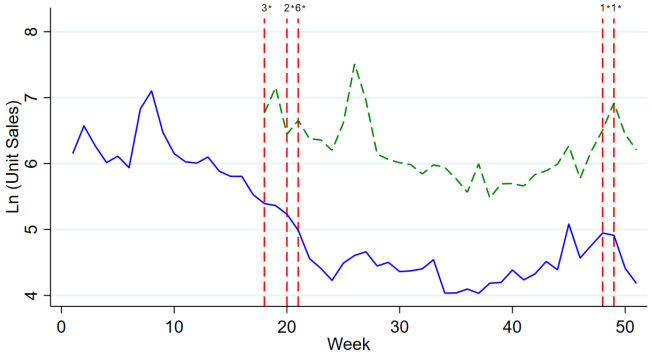
Institutional Details and Setting

- Blur enabled financing lending for 13 collections in profile pictures (PFP) category
  - Staggered roll-out between May 2023 and December 2023
  - Chosen collections account for 51% of Blur's total dollar sales
- Financing similar to BNPL
  - Loans offered by users who set fixed interest rates over predefined repayment terms
  - Lenders protected against default through collateralization
  - Buyers choose whether to utilize one of available loan offers
- Same NFT can be traded on multiple platforms; financing exclusive to Blur

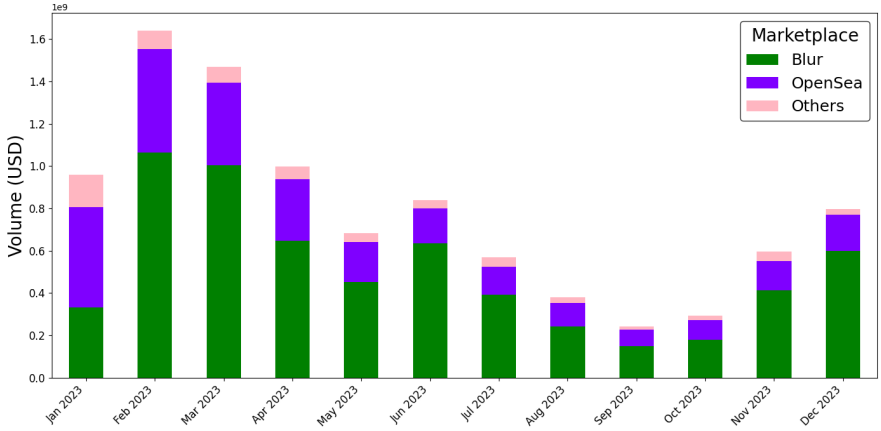
Data Description

- 52 weeks of data from January 2023 - December 2023
- Transaction level information for 13 focal and 42 additional collections in PFP, gaming, art and membership categories
- Detailed trading data across Blur and OpenSea
  - Data aggregated to weekly level for each NFT
- Unique user ID allows us to disentangle new and existing users

Quantities sold by Collection Type



Quantities sold across Platforms



Variation in Outcomes by Treatment

	Treat Pre	Treat Post	Control Pre	Control Post
Avg ln(Quantity)	6.2917	5.9639	4.3314	3.7632
Avg ln(Price)	9.1148	9.2504	6.9638	6.4590
Avg ln(Revenue)	14.6682	14.4674	10.6320	9.5812

Empirical Approach - Key Issues

- **Do not observe counterfactual** for collections
  - Select control group of collections
  - Control collections similar to treated collections but without substitution or spillovers
  - Two popular NFT collections from PFP category and top-performing collections from Art, Gaming, and Membership

Two-Way Fixed Effects Model

$$\ln(Y_{it}+1) = \beta_0 + \beta_1 Treatment_i * Post_{it} + \gamma_i + \eta_t + \varepsilon_{it} \quad (1)$$

Empirical Approach - Key Issues

- Financing enabled for **top-performing collections**
  - Collection fixed effects partially addresses this
- Multiple treatment groups and staggered timing
  - Two-Stage DiD model (Gardner 2022)
- Parallel trends and linearly additive effects assumption may not hold
  - **Synthetic DiD** (Arkhangelsky et al. 2021)
- Substitution or spillover across control and treatment collections
  - Conduct robustness checks by excluding overlapping users or restricting controls to collections with minimal overlap

Financing increases Sales and Revenue but only at Blur

	Blur			Opensea			Listings
	Quantity (1)	Price (2)	Revenue (3)	Quantity (4)	Price (5)	Revenue (6)	# Listings (7)
All Transactions							
Synthetic DiD	0.398**	-0.097	1.399**	0.036	-0.030	0.446	0.983***
	(0.187)	(0.163)	(0.574)	(0.167)	(0.152)	(0.501)	(0.436)
Two-Stage DiD	0.522**	0.206	1.178***	0.045	0.225	0.523*	0.757
	(0.218)	(0.220)	(0.417)	(0.137)	(0.219)	(0.309)	(0.480)
TWFE	0.528**	0.117	1.217**	0.067	0.182	0.567*	0.822**
	(0.249)	(0.234)	(0.491)	(0.159)	(0.408)	(0.334)	(0.482)
Non-BNPL Transactions							
Synthetic DiD	0.210	-0.098	1.209*	–	–	–	–
	(0.200)	(0.186)	(0.734)				

Financing cannot grow a platform by acquiring new users

	Blur (1)	Opensea (2)
# New Users making a purchase	-0.006	-0.057
	(0.153)	(0.144)
Quantity New User	0.067	-0.022
	(0.174)	(0.151)
# Existing Users making a purchase	0.559***	-0.105
	(0.170)	(0.115)
Quantity Existing User	0.972***	0.130
	(0.241)	(0.166)
Quantity Share among Existing Users	0.123***	-0.063***
	(0.022)	(0.017)
Revenue Share among Existing Users	0.124***	-0.064***
	(0.025)	(0.021)

Increase in Sales driven by Purchases of more expensive NFTs

- A phenomena similar to **"Flight to Quality"**

	Blur		Opensea	
	Top 20% (1)	Bottom 20% (2)	Top 20% (3)	Bottom 20% (4)
Sales (By Price)	0.601***	0.143	0.084	-0.083
	(0.152)	(0.267)	(0.183)	(0.152)

Contribution of Supply- and Demand-Side

- Important to understand extent to which increase in sales driven by supply- and demand-side changes
- Ability to observe number of listing allows quantification of supply side effects

$$Y_{it}^1 - Y_{igt}^0 = nlist_{it}^1 \pi_{it}^1 - nlist_{it}^0 \pi_{it}^0 = \underbrace{\left(nlist_{it}^1 - nlist_{it}^0\right) \pi_{it}^1}_{supply} + \underbrace{nlist_{it}^0 \left(\pi_{it}^1 - \pi_{it}^0\right)}_{demand} \quad (2)$$

- **74% of sales increase driven by an increase in demand**
- Results qualitatively similar if focus only on the Top 20% NFTs

Results robust to several Robustness Checks

	Blur			Opensea		
	Quantity (1)	Price (2)	Revenue (3)	Quantity (4)	Price (5)	Revenue (6)
Eliminating Overlap in Users						
Eliminate Overlapping Users	0.351**	-0.064	0.966**	-0.030	-0.033	0.424
	(0.169)	(0.229)	(0.403)	(0.176)	(0.409)	(0.564)
Minimum Overlapping Control	0.607**	-0.107	2.957**	0.069	-0.016	1.683*
	(0.292)	(0.204)	(1.173)	(0.247)	(1.558)	(0.922)
Falsification Tests						
Pseudo Treatment Group	-0.241	0.220	-0.294	-0.114	-0.204	0.137
	(0.229)	(0.299)	(0.636)	(0.139)	(0.154)	(0.594)
Pseudo Treatment Week	-0.101	-0.150	0.183	-0.045	0.151	0.277
	(0.270)	(0.305)	(0.507)	(0.121)	(0.303)	(0.431)

In Summary...

- Financing increases sales and revenue of a platform without distorting the prices
  - No spillover effect of financing on competing platform
  - Suggestive evidence of increase in sales without utilization of financing
- Financing cannot be used to grow platform by acquiring new users
- Increase in sales driven by increase in sales of more expensive NFTs ("Flight to Quality")
- Majority of the sales increase attributable to demand increase
  - Financing can result in sustainable profits

Thank you!