Upstart ($UPST)

Price Target: $178.84, Upside: 24%

Superior Underwriting, Continuous Growth

(Last Updated 4/6/21)

University of California, Berkeley

Ashwin Bindra and Tejas Thvar

Meet the Team

Ashwin Bindra
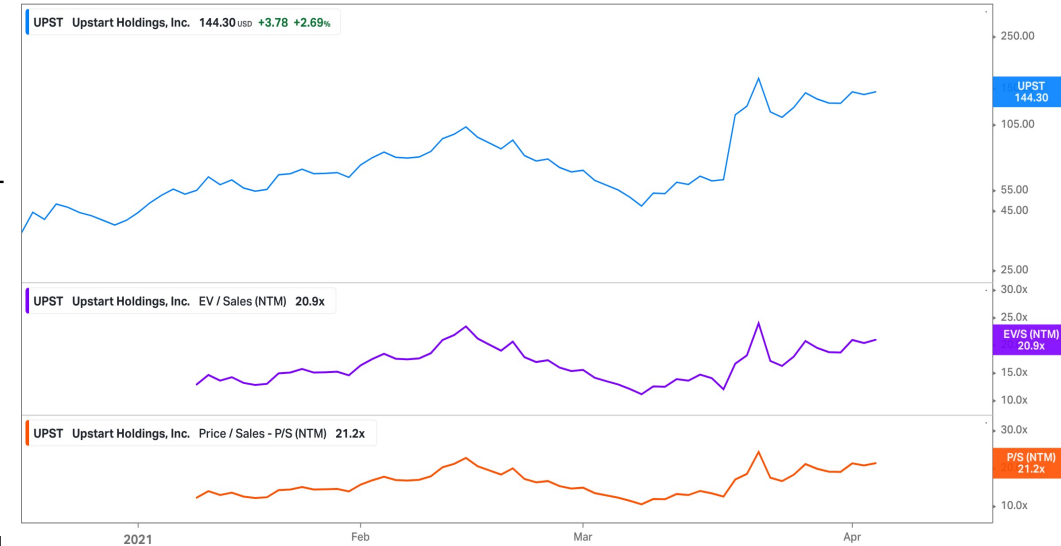Statistics and Business Administration
Princeton, New Jersey

Tejas Thvar
EECS and Business Administration
Los Altos, California

Overview   Theses   Valuation   Pre-Mortem

Industry and Business Overview
Upstart's Business Model and Recent Industry Dynamics

- **Products:** UPST is a loan platform lender; it originates and underwrites personal unsecured loans and uses banks and financial institutions as capital providers.
  - UPST's **proprietary statistical machine learning algorithms accurately assess credit risk.** Unlike traditional lenders' predominant use of FICO scores, UPST uses variables including education, field of study, income, potential future earning income, and debt obligations
  - **Loan Process:**
    1. Consumer **requests** loan via upstart.com or other source (white-label Bank product)
    2. UPST **underwrites** the consumer and assesses his/her credit quality
    3. UPST **provides** the consumer the loan via capital from partner banks
    4. UPST **services** the loan on the behalf of the partner bank (collects and sends payments to partner banks subtracting a servicing fee)
  - **Key costs** include customer acquisition/marketing (50% of UPST loans are through Credit Karma), R&D expenditure, and payroll.
- **Financials:** $233M Revenue 2020 (+42% YOY) | EV/Sales 20.85 | Market Cap 10.6B
- **Key Competitors:**

UPST Upstart Holdings, Inc. 144.30 USD +3.78 +2.69%

UPST Upstart Holdings, Inc. EV / Sales (NTM) 20.9x

UPST Upstart Holdings, Inc. Price / Sales - P/S (NTM) 21.2x

Share of Total Personal Loan Balances
- FinTech (38%)
- Traditional Finance Company (13%)
- Credit Union (21%)
- Bank (28%)

LTM Revenue Breakdown
- Referral Fees (55%)
- Platform Fees (33%)
- Service Fees (9%)

Upstart

Leadership

Upstart management consists of veteran innovators and operators

Paul Gu
Product & Data Science

Developed risk analysis software for microlenders and D.E. Shaw, Thiel Fellow

Dave Girouard
CEO

Grew billion-dollar cloud apps business worldwide as Google Enterprise President

Anna Counselman
People & Operations

Led Gmail Consumer Operations, grew from 150 million to 450 million users

Sanjay Datta
CFO

Scaled Google's core $80B economic engine as VP of Advertising and Finance

Michael Lock
SVP Bank Partnerships

Founded and grew Google Enterprise w/ Dave, led sales at IBM/Oracle

Upstart

Overview — Theses — Valuation — Pre-Mortem

Investment Overview – Long $UPST

With superior underwriting, we believe UPST is an industry leader with a ton of upside potential

Theses:

1 Best-In-Class Underwriting

2 AI Flywheel

3 Playing into a Large, Rapidly Expanding TAM

Pre-Mortem:

Underwriting Proves Deficient

Funding Risk

Inability to Underwrite in Economic Downturns

Valuation:

We are expecting an increase in UPST share price to a price target of $178.84 (24.0% expected upside).

Upstart

Overview — Theses — Valuation — Pre-Mortem
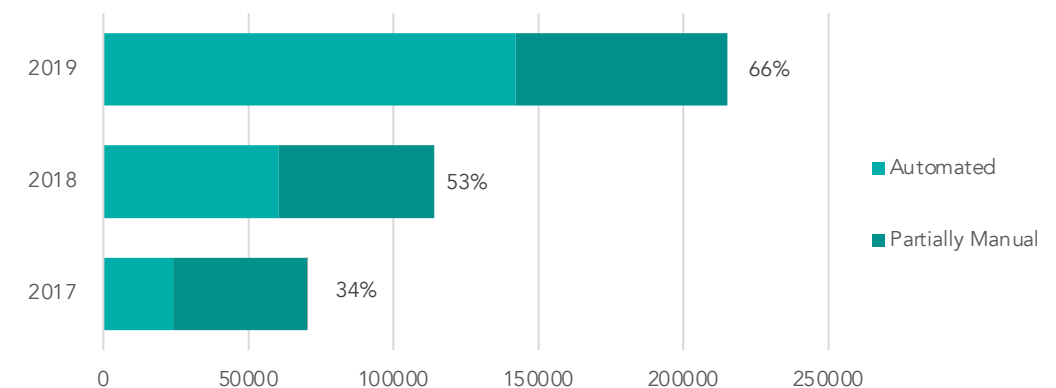
#1 Best-In-Class Underwriting

Utilizing proprietary ML/AI algorithms and more robust data ingestion, Upstart can more accurately underwrite consumers

Superior Underwriting Ability:

- Underwriting, especially for the smallest banks and credit unions, has not kept up with the pace of innovation in cloud computing and ML. The average small/mid-sized banks still rely on static FICO scores.
    - In the US alone, **80% of Americans never defaulted on a loan payment, yet only 48% of Americans have access to prime credit.**
- UPST's AI/ML algorithms capitalize on over **1,600 variables** and have been trained on **9M+ repayment events**
- UPST has seen its model continually improve over time. As seen on the right, UPST has seen its **fully automated loans increase 32% from 34% to 66% of transacted loans in just two years**.
    - This represents an underwriting flywheel that allows efficiency to compound over time (more on this in thesis #2).
- UPST holds a 'no-action' letter from the CFPB. The CFPB selectively gives out no-action letters for companies pursuing technologies that can have outstanding benefits for consumers. Given the historic conservatism of the CFPB, it is hard to understate the vote of confidence the CFPB was willing to give the young start-up.

48% Americans who have access to prime credit

80% Americans who never defaulted on a credit product

Number of Loans Fully Automated vs Partially Manual Overtime

2019 — 66%
2018 — 53%
2017 — 34%

Legend: Automated / Partially Manual

x-axis: 0, 50000, 100000, 150000, 200000, 250000

Upstart

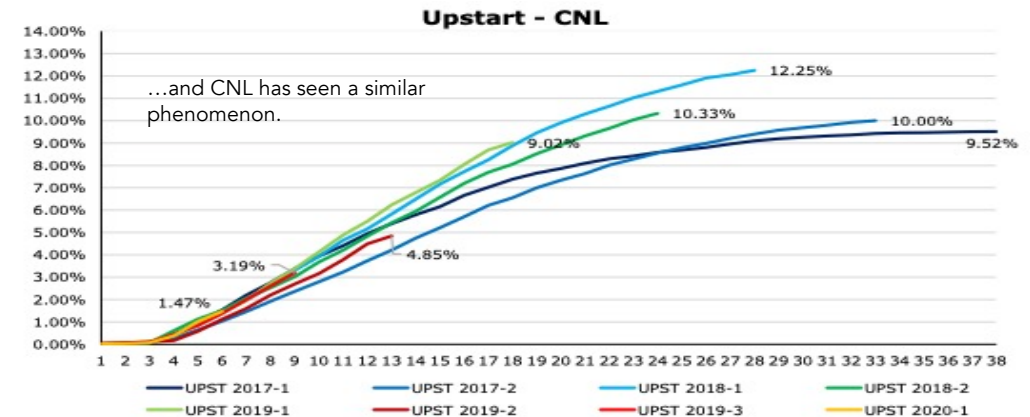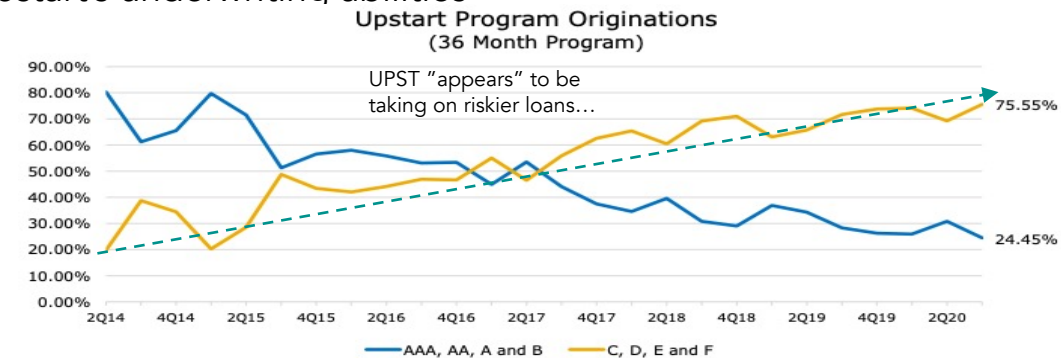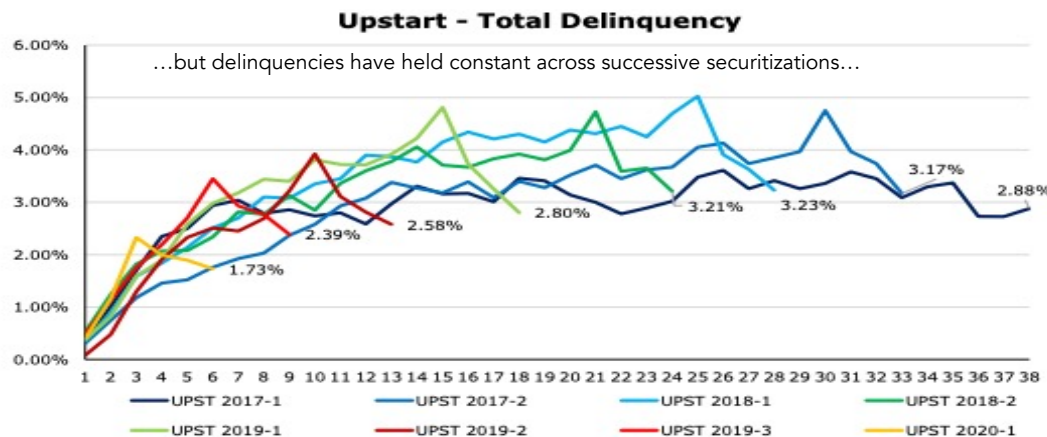Overview — Theses — Valuation — Pre-Mortem

#1 Best-In-Class Underwriting (cont.)

Analyzing securitizations of Upstart loans provides a lens into the strength of Upstart's underwriting abilities

Securitized Loans Analysis:

- UPST's superior underwriting capabilities allow it to approve "riskier" loans with little effect on delinquencies and cumulative net loses ("CNL").
- UPST has become more confident in its model's underwriting ability. As of **July 2020, 76% of loans originated from UPST were rated C, D, E, or F by Moody's, up from 20% in 2014**. Despite originating lower grade loans, **UPST has seen no impact on its delinquency rates or CNL**. This is indicative of UPST's ability to underwrite risk more accurately than traditional underwriting models.

Upstart Program Originations (36 Month Program)

UPST "appears" to be taking on riskier loans…

Upstart - Total Delinquency

…but delinquencies have held constant across successive securitizations…

Upstart - CNL
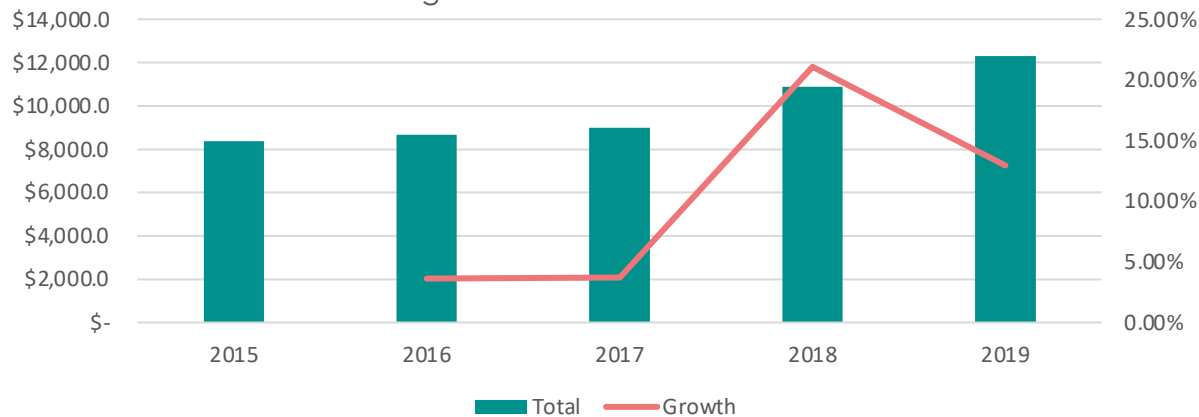
…and CNL has seen a similar phenomenon.

- With best-in-class technology, UPST proves its superior underwriting ability. Over time we hypothesize that more and more banks will be willing to fund Upstart written loans with a continued track record of success.
  - Currently ~93% of revenues come from UPST referrals. We think this will decrease to 74% by 2023.
- Even in times of economic downturn, UPST's relatively nascent model was able to be more accurate than current lending practices. During the COVID-19 pandemic, **UPST's model was able to be 5x more predictive than FICO scores**.
  - More illustrative, bank partners were quick to "turn-on" UPST during COVID. Q2 2020 saw an 86% q/q decline in loan originations as bank partners and capital markets aggressively sought to reduce risk. In Q3 2020, however, loans originated recovered rapidly to 96% of pre-COVID levels. This represented a strong vote of confidence from UPST's funding sources.

Upstart

#1 Case Study: UPST is **not** Lending Club
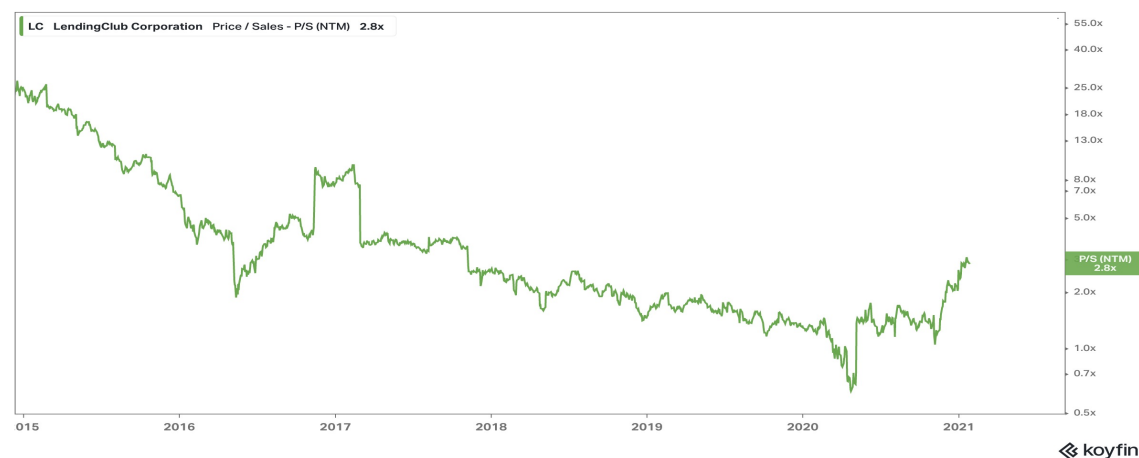
A quick case study on one of UPST's competitors can highlight the key differences between the two companies

Loan Originations 2015-19

Though Lending club saw consistent/flat charge-off rates, loan originations begin to decelerate in 2016. This is a result of Lending Club experiencing an increase in competition with an undifferentiated product...
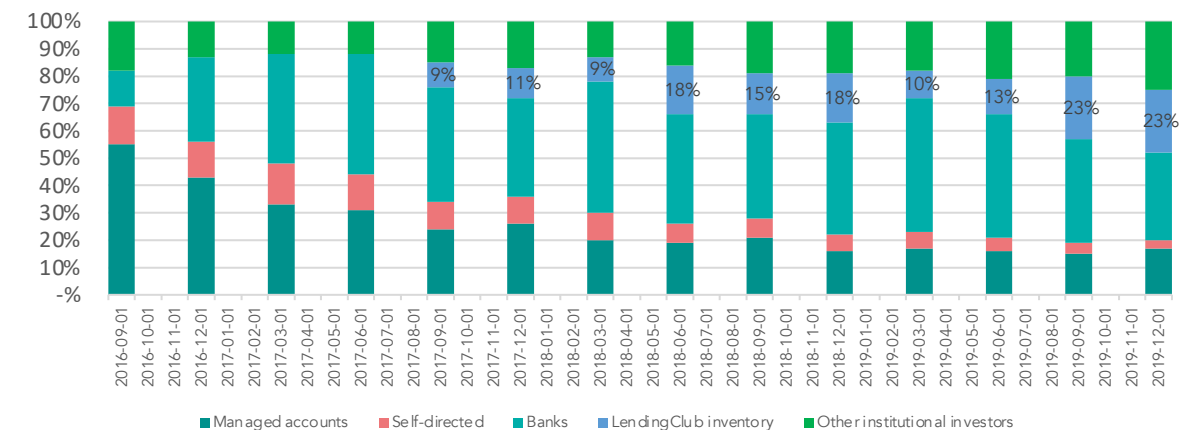
To keep loan originations growing, Lending Club is forced to fund more loans themselves, increasing b/s risk. This is indictive of not having superior underwriting as institutional and retail investors as well as banks are not willing to fund more loans.

Funding Mix 2015-19

LC P/S LTM

Increasing B/S risk leads to compression on P/S multiple, indictive of LC's poor performance overtime. By trying to fund loans itself and keep growth alive, LC was forced to take more risk on their B/S, inadvertently crushing their multiple.

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#1 Case Study: UPST is **not** Lending Club

A quick case study on one of UPST's competitors can highlight the key differences between the two companies
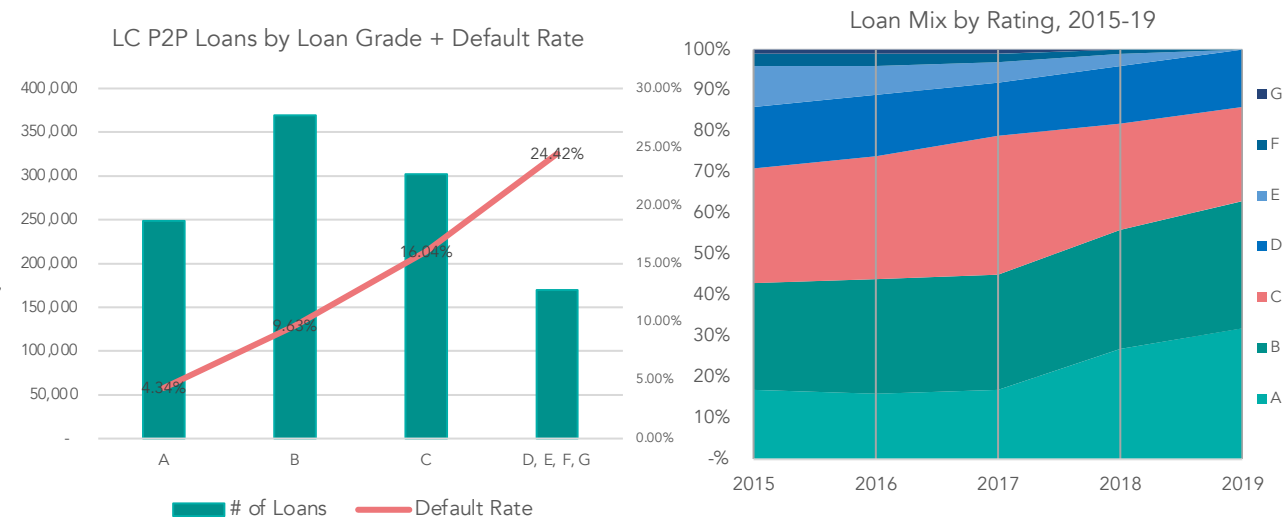
Statistical Analysis on Scraped Lending Club Loans:

- Parsed **over 1,000,000 36 month-term P2P loans from 2014 – 2017** accepted by LC*
- Calculated default rate and average FICO score per company and assigned grade/loan risk class.
  - Computed default rates by dividing defaulted and charged off loan numbers by total number of loans per grade. Similarly computed average FICO score per grade.
- Loans rated D, E, F, G, had a combined default rate of 24.42%. ==All loan classes had a combined default rate of 12.51%, compared to the ~9% for all UPST loans. UPST and LC have similar default rates but at lower FICOs==
- LC's poor underwriting ability led to the breaking down of its P2P funding marketplace. If retail investors were not getting expected returns, they stopped putting money in LC underwritten loans. To keep growing loan originations, LC must fund its own loans, and thus caused the compression of its P/S multiple.

* Link to Github Repo: https://github.com/tthvar/upstart_long

Overview of Loan Risk Classes

Loan Grade(s)	# of Loans	Default Rate	Average FICO Score
A	248,627	4.34%	727.4
B	368,969	9.63%	694.1
C	302,241	16.04%	686.2
D, E, F, G	169,820	2 4.42%	682.8
All Loan Classes	1,089,657	**12.51%**	697.8

Breakdown of High-Risk Loans

Loan Grade	# of Loans	Default Rate	Average FICO Score
D	124,529	22.41%	683
E	36,285	28.53%	682
F	7,281	34.57%	681
G	1,725	40.11%	679
D,E,F,G	169,820	**24.42%**	683

LC P2P Loans by Loan Grade + Default Rate

Loan Mix by Rating, 2015-19

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#2 AI Flywheel

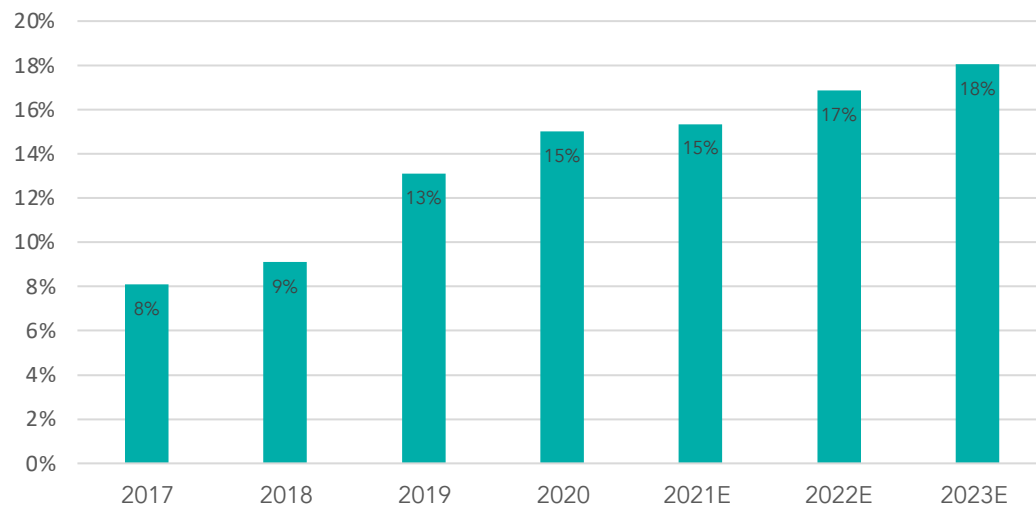Upstart has a flywheel which drives continuous improvement as it scales
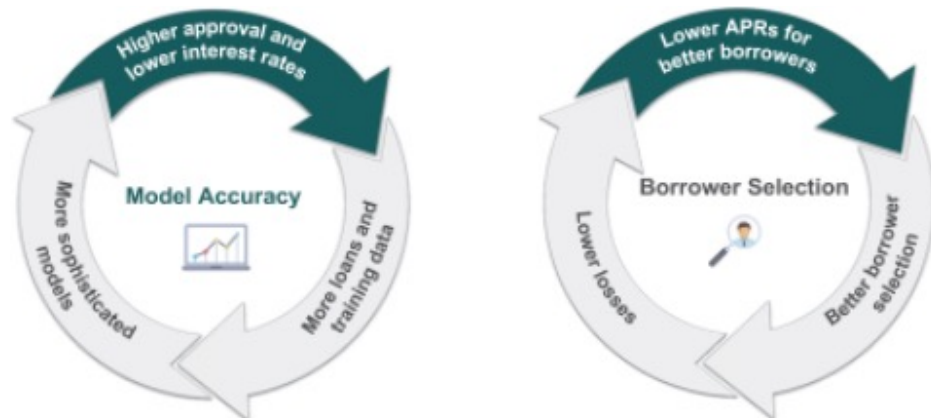
- UPST's flywheels serve to increase model accuracy and borrower selection as it scales.
- More loans and trading data allow for a more sophisticated model → leading to higher approval → lower interest rates.
- Lower APRs for borrowers → better borrower selection → lower losses for UPST.
- Their flywheel dynamics are directly trigged by increase the number of loans transacted. UPST has seen its loan funnel conversion increase from **8.1% in 2017 to 13% in 2019**.

Conversion Rate

Year	Value
2017	8%
2018	9%
2019	13%
2020	15%
2021E	15%
2022E	17%
2023E	18%

Number of Loans Fully Automated vs Partially Manual Overtime

- 2019: 66%
- 2018: 53%
- 2017: 34%

Automated
Partially Manual

Overview　　Theses　　Valuation　　Pre-Mortem
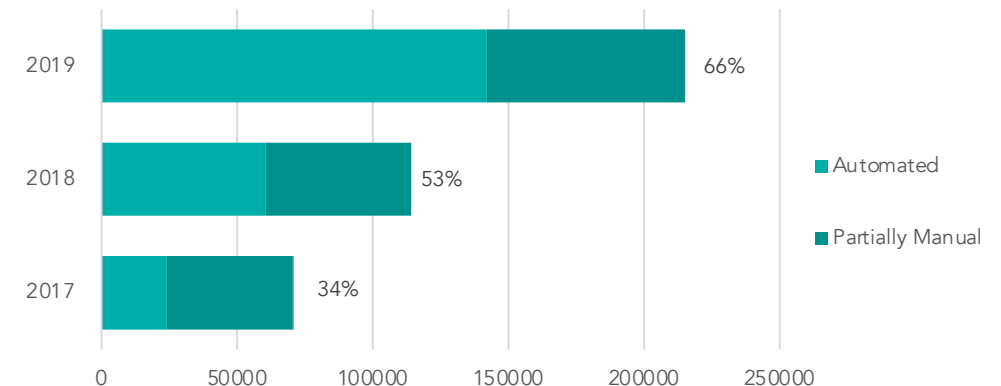
#2 AI Flywheel

Upstart has a flywheel which drives continuous improvement as it scales

VADER Sentiment Analysis

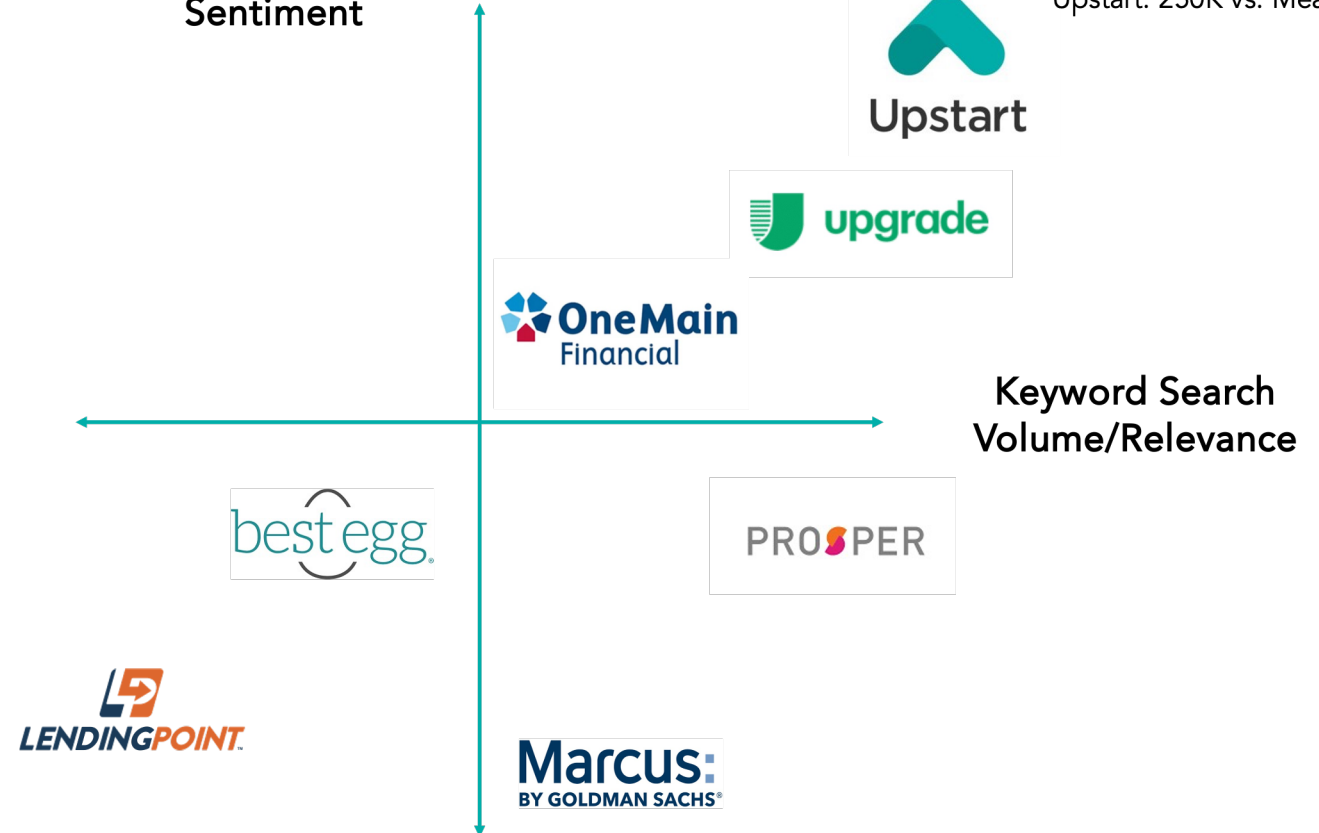- Credit Karma currently accounts for ~50% of traffic to UPST. Using Credit Karma reviews as a proxy for customer sentiment, our team analyzed over **2,000 reviews on UPST and its main competitors***
- Valence Aware Dictionary for Sentiment Reasoning (VADER) is a model used for text **sentiment analysis** that is sensitive to both polarity (positive/negative) and intensity (strength) of emotion.
- UPST consistently ranked high in its VADER sentiment analysis score and keyword search volume. **UPST scored 3.0x average positive sentiment.**
  - UPST generates 2.7x avg monthly search volumes and demonstrates strong organic CTR rates.
- With a focus on growing conversion rates and increases loans transacted, UPST can keep its flywheel spinning and ensure its model continues to improve over time.

* Link to Github Repo:
https://github.com/tthvar/upstart_long

VADER Positive Sentiment:
Upstart: 235.6 vs. Mean: 78.9
*Monthly Searches:*
Upstart: 250K vs. Mean: 92K

Credit Karma Reviews Cumulative VADER Sentiment

Keyword Search Volume/Relevance

Overview — Theses — Valuation — Pre-Mortem

# #3 Upstart is playing into a large, rapidly expanding TAM
Upstart's total addressable market continues to increase and maintain low penetration

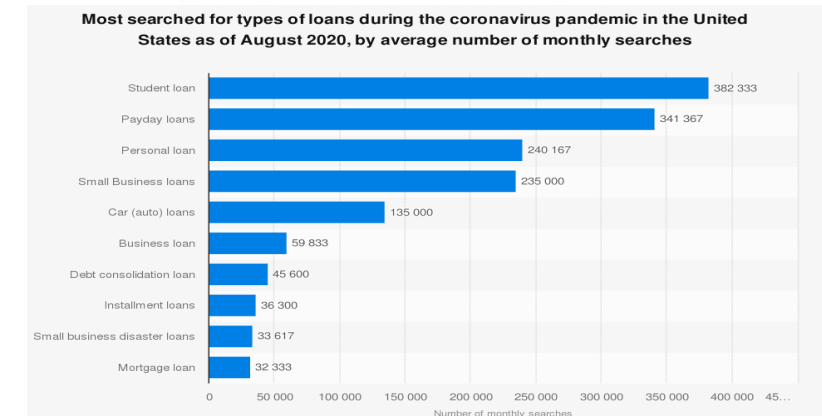UPST TAM Potential (Excluding Housing; Outstanding Balances as of 3Q20)
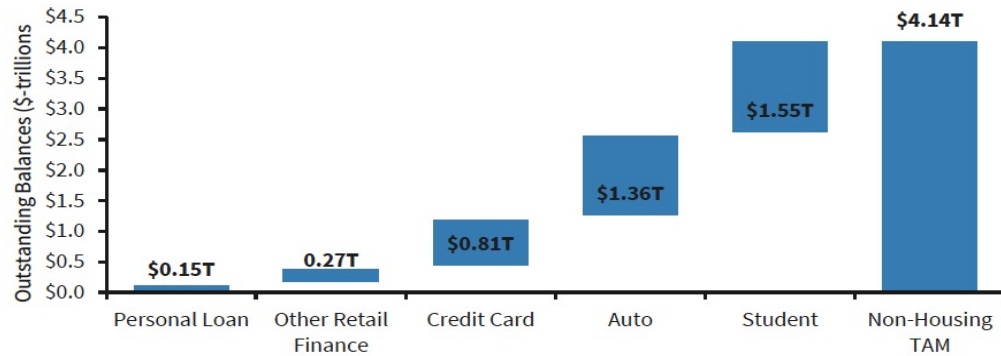
Underpenetrated, expanding loans market:
- UPST currently focuses on unsecured loans, which represents a TAM of **$161 B**
- With superior underwriting, UPST has been able to begin to move into other loan markets such as auto loans ($625 B), equity lines, credit card refinancing, student loans, and POS financing.
  - All combined, the TAM for UPST is > $900 B.
- Acquired Prodigy Software
  - Cloud automotive retail software
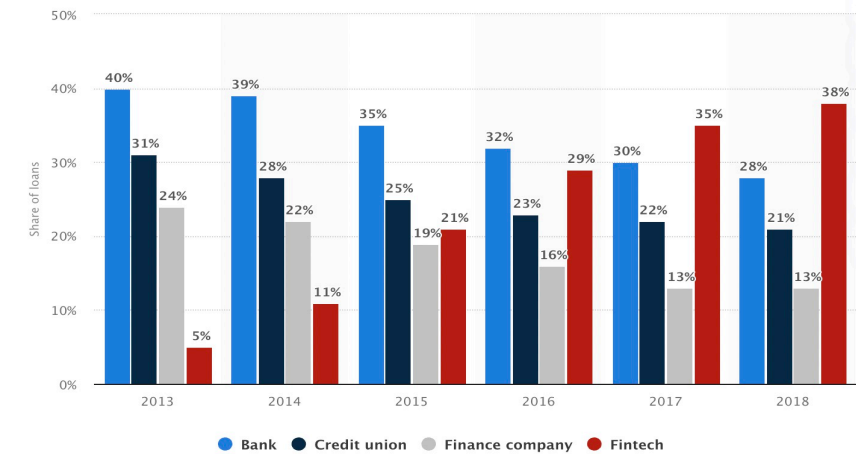
Adoption of FinTechs and banking Alternatives
- UPST benefits from the secular trend of consumers moving away from tradition lenders after the GFC.
  - Personal Loans for FinTechs grew **at 85% CAGR from 2013-18** (Statista)
- The Great Financial Crisis of 2008 created a perfect environment for the rise of FinTechs like UPST. Greater capital requirements for traditional lenders and increased regulation formed a perfect storm for FinTechs:
  - Banks had stricter underwriting standards, which limited access to affordable credit for consumers.
  - FinTechs have also been able to use stronger customer acquisition models
- Searches for loans during COVID-19 yielded the results on the right, notably student and personal loans ranked in the top three results.

Most searched for types of loans during the coronavirus pandemic in the United States as of August 2020, by average number of monthly searches

Upstart

Overview   Theses   Valuation   Pre-Mortem

Valuation

After calculating EV/NTM contribution profit for a handful of comparable companies, an expected value for UPST was reached

Note: Valuing UPST on EV/ Contribution Profit because: 1) Current market environment values high-growth, high-quality companies on EV/Sales, and 2) contribution profit helps neutralize for comparable with different amounts of exposure.

Key Financial Information

(In thousands, except share and per share amounts)	2017	2018	2019	2020E	2021E	2022E	2023E
Revenue:							
Referral fees, net	30921	53869	90672	133425	238520	426565	694518
Platform fees, net	17146	29512	53383	66832	151177	279942	472536
Servicing fees, net	3094	5101	15792	28343	64113	118722	200399
Revenue from fees, net	51,161	88,482	159,847	228,600	453,810	825,229	1,367,453
Interest income and fair value adjustments, net	6,128	10,831	4,342	4,816	27,229	41,261	54,698
as % rev	12%	12%	3%	2%	6%	5%	4%
Total revenue	**57,289**	**99,313**	**164,189**	**233,416**	**481,038**	**866,490**	**1,422,152**
Borrower Acquisition Cost	(32,777)	(61,658)	(89,569)	(91,700)	(187,408)	(365,627)	(738,174)
Borrower Verification and Servicing Costs	(9,119)	(13,726)	(21,338)	(31,812)	(70,318)	(130,212)	(219,794)
Contribution Profit	**15,393**	**23,929**	**53,282**	**109,904**	**223,312**	**370,651**	**464,183**
Growth YoY		55%	123%	106%	103%	66%	25%
Contribution Margin	**27%**	**24%**	**32%**	**47%**	**46%**	**43%**	**33%**

Platform Fees, Referral Fees, and Servicing Fees Revenue 2017-23E

Legend: Referral fees, net | Platform fees, net | Servicing Fee, Net
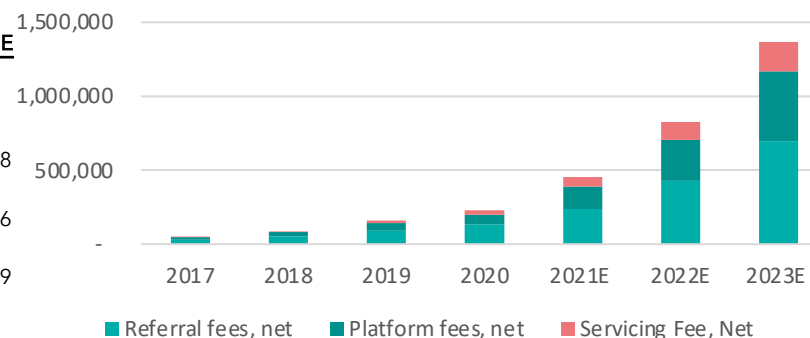
Number of Platform Loans and Percent Referred by UPST

Legend: Number of Platform Loans | Percent Referred Loans
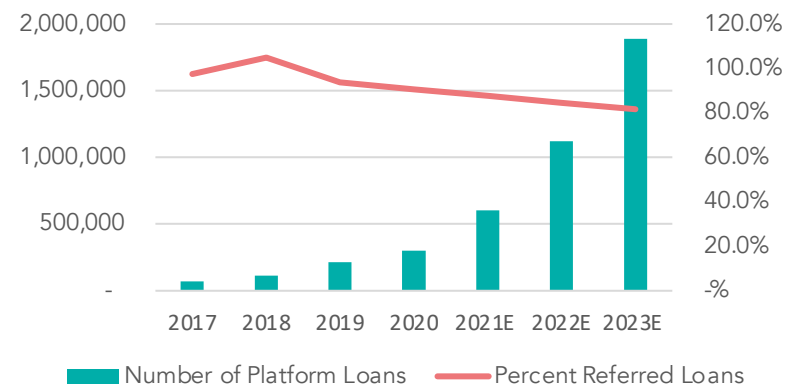
2023E Contribution Profit	$ 464,183
Discount Rate	10%
Two Y Fwd Contribution Profit	421,985
Cy20-23 Contribution profit CAGR	61.64%
NTM EV/Contribution Profit Peg	0.50
NTM EV/Contribution Profit	30.83
Enterprise Value (m)	13,006
Less Net Debt	47.348
Market Cap (M)	12,959
Shares Outstanding	72.46
Price Target	**178.84**
Current Share Price	144.30
Upside	**24%**

Upstart

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Pre-Mortem

This investment failed, Why?

Underwriting Proves Deficient

UPST relies heavily on its superior underwriting abilities to attract funding capital. If UPST is unable to keep their model at its current level of accuracy, UPST's ability to attract funding capital and continue to grow will be hampered.

Mitigant: Our analysis of UPST's securitizations, qualitative understanding of its AI flywheel, and appreciation of the CFPB's letter of "no-action", gives us confidence in UPST's underwriting model.

Funding Risk

UPST funds few loans from its own b/s (<3%); it relies on partner banks/institutional investors to fund loans. Given that UPST is valued on long-term high growth aspects, periods of uncertainty that lead to its funding partners cutting capital and impacting loan growth could lead to severe multiple contraction.

Mitigant: Thought not a "true" economic recession, we saw UPST quickly bounce back during the COVID-19 pandemic. As UPST continues to prove its superior underwriting, we believe more banks and institutional investors will be willing to take on UPST loans (ex: Oriental Bank). This will help to mitigate funding risk if UPST has a strong track record of success in underwriting with an increasingly diverse set of funding partners.

Inability to Underwrite in Economic Downturns

UPST has not been able to operate in a true financial crisis (without unprecedented amounts of stimulus). We yet cannot determine how well UPST will be able to operate and perform in times of "true" economic decline.

Mitigant: UPST was able to bounce back quickly during COVID-19 and kept client losses (if any) to a minimum. Furthermore, analysis of UPST's riskiest loans indicates that it has an edge in underwriting as delinquency rates were unaffected by lower ratings. We believe these factors are a strong indication of underwriting abilities that perform well in most economic conditions.

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Questions & Answers

	2017	2018	2019	2020	2021E	2022E	2023E
Number of Platform Loans	70,457	114,125	215,122	300,379	604,627	1,119,620	1,889,892
Percent Referred Loans	97.5%	104.9%	93.7%	91%	88%	85%	82%
Number of Referred Loans (Upstart - Referred Only)	68,713	119,709	201,493	272,338	530,044	947,922	1,543,374
Average Loan Principal of Referred Loans	12,857	12,857	12,857	12,857	12,857	12,857	12,857
Implied Loans Principal Amount from Referrals	883,457	1,539,114	2,590,629	3,501,484	6,814,854	12,187,575	19,843,379
Referral fee %	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
Referral fees, net	30,921	53,869	90,672	133,425	238,520	426,565	694,518
Number of Platform Inquiries	869,840	1,254,121	1,642,153	1,976,178	3,483,557	5,609,295	8,176,474
Growth YoY		44%	31%	20%	76%	61%	46%
Conversion Rate	8.1%	9.1%	13.1%	15.2%	17.4%	20.0%	23.1%
Growth YoY		12.3%	44.0%	16.0%	14.2%	15.0%	15.8%
Number of Platform Loans (Both Distribution Channels)	70,457	114,125	215,122	300,379	604,627	1,119,620	1,889,892
Growth YoY		62.0%	88.5%	39.6%	101.3%	85.2%	68.8%
Average Loan Principal of Platform Loans	12,168	12,930	12,408	12,502	12,502	12,502	12,502
Implied Loans Principal Amount from Platform	857,300	1,475,600	2,669,150	3,341,600	7,558,843	13,997,112	23,626,794
Platform fee %	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Platform fees, net	17,146	29,512	53,383	66,832	151,177	279,942	472,536
Implied Loans Principal Amount from Platform	857,300	1,475,600	2,669,150	3,341,600	7,558,843	13,997,112	23,626,794
Implied Servicing Fee	0.36%	0.35%	0.59%	0.85%	0.85%	0.85%	0.85%
Servicing Fee, Net	3,094	5,101	15,792	28,343	64,113.08	118,721.61	200,399.27
Implied Loans Principal Amount from Referrals	883,457	1,539,114	2,590,629	3,501,484	6,814,854	12,187,575	19,843,379
Acquistion Cost %	3.71%	4.01%	3.46%	2.62%	2.75%	3.00%	3.72%
Borrower Acquisition Cost	32,777	61,658	89,569	91,700	187,408	365,627	738,174
Implied Loans Principal Amount from Referrals	70,457	114,125	215,122	300,379	604,627	1,119,620	1,889,892
Verification & Servicing Cost %	12.94%	12.03%	9.92%	10.59%	11.63%	11.63%	11.63%
Borrower Verification and Servicing Cost	9,119	13,726	21,338	31,812	70,318	130,212	219,794

Implied Revenue Build

	2017	2018	2019	2020	2021E	2022E	2023E
Number of Inquries	869,840	1,254,121	1,642,153	1,976,178	3,483,557	5,609,295	8,176,474
Growth YoY		44%	31%	20%	76%	61%	46%
Loans Transacted	70,457	114,125	215,122	300,379	604,627	1,119,620	1,889,892
Growth YoY		62.0%	88.5%	39.6%	101.3%	85.2%	68.8%
Conversion Rate	8.1%	9.1%	13.1%	15.2%	17.4%	20.0%	23.1%
Growth YoY		12.3%	44.0%	16.0%	14.2%	15.0%	15.8%
Avg Fee	726.13	775.31	743.05	761.04	750.56	737.06	723.56

VA Ticker	BBG Ticker	Contribution Profit CY-20	CY-21	CY-22	CY-23	CY20-22E CAGR	CY20-23E CAGR	Enterprise Value	EV/NTM Contribution Profit Multiple	PEG (CY20-23E, when possible)
High-Growth, Non-BS/BS-Light Fintech Lending Platforms:										
PYPL	PYPL US Equity	11,722	13,652	15,863	18,030	16.3%	15.4%	276,510	20.3x	1.31
APT_AU	APT AU Equity	467	750	1,109	1,517	54.0%	48.0%	29,144	38.9x	0.81
AFRM	AFRM US Equity	180	251	402	603	49.2%	49.5%	30,167	120.1x	2.43
Katapult	FSRV US Equity	40	70	151	216	94.3%	75.4%	2,515	35.9x	0.48
High-Growth, Non-BS Specialty Merchant Acquirers:										
RPAY_US	RPAY US Equity	26	51	65	49	58.4%	24.2%	2,184	42.6x	1.76
LSPD_CA	LSPD CN Equity	45	67	105	NA	52.5%	NA	8,032	119.9x	2.28
NVEI_CA	NVEI CN Equity	232	292	346	399	22.2%	19.9%	7,516	25.7x	1.29
FOUR_US	FOUR US Equity	205	275	338	412	28.5%	26.2%	5,993	21.8x	0.83
Paysafe	BFT US Equity	420	561	640	729	23.4%	20.2%	15,762	28.1x	1.39
High-Growth, B2B Platforms:										
BILL_US	BILL US Equity	94	122	151	172	26.5%	22.1%	9,725	79.8x	3.61
COUP_US	COUP US Equity	205	250	345	467	29.8%	31.6%	23,886	95.7x	3.03
SHOP_US	SHOP US Equity	959	1,231	1,650	2,273	31.2%	33.3%	140,971	114.5x	3.43
Non-BS, Loan Marketers/Originators:										
TREE_US	TREE US Equity	337	411	493	603	20.9%	21.3%	4,487	10.9x	0.51
Slow Growing, BS Lenders:										
GSKY_US	GSKY US Equity	181	159	284	NA	25.2%	NA	1,068	6.7x	0.27
OMF_US	OMF US Equity	1,901	2,166	2,376	NA	11.8%	NA	22,856	10.6x	0.89

Upstart

Overview — Theses — Valuation — Pre-Mortem