DID FINTECH LOANS DEFAULT MORE DURING THE COVID-19 PANDEMIC? WERE FINTECH FIRMS "CREAM-SKIMMING" THE BEST BORROWERS?

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Julapa Jagtiani,
Cathy Lemieux, and
Brandon Goldstein

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AGENDA

Our Research Questions:

(1) Do proprietary loan rating systems accurately predict the likelihood of default?

(2) Can a proprietary loan rating system, leveraging alternative data, that was developed in a favorable economic period continue to perform well under adverse economic conditions (such as the COVID-19 pandemic)?

(3) Have fintechs been "cream skimming," i.e., underpricing the cost of credit to top-tier customers?

The Results:

- LendingClub's loan rating system is superior to traditional measures of credit risk when predicting the likelihood of default. The loan rating system continued to perform well during the pandemic period. No evidence of cream skimming.

THE DATA

Data on loans originated through an online alternative channel (loan-level data from the **LendingClub** consumer platform).

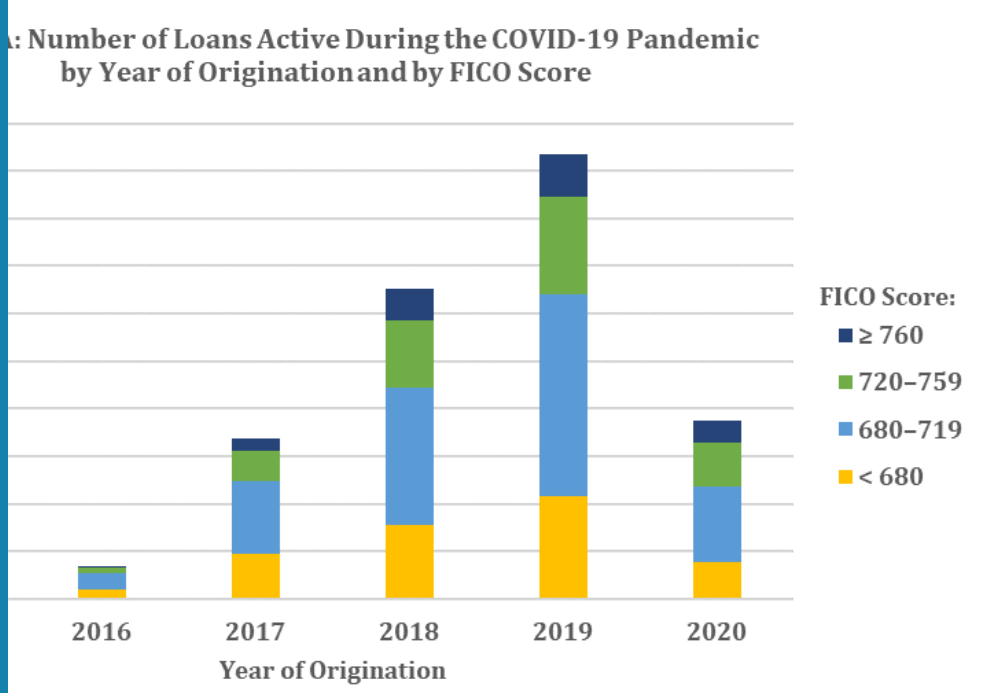
Economic factors -- from the U.S. Census Bureau and the Haver Analytics database -- state initial unemployment claims, local unemployment rate, local average household income, local business bankruptcies per thousand residents, local home price index, etc. The economic factors are used at the most granular level associated with the borrower (the zip code, county, or state level).

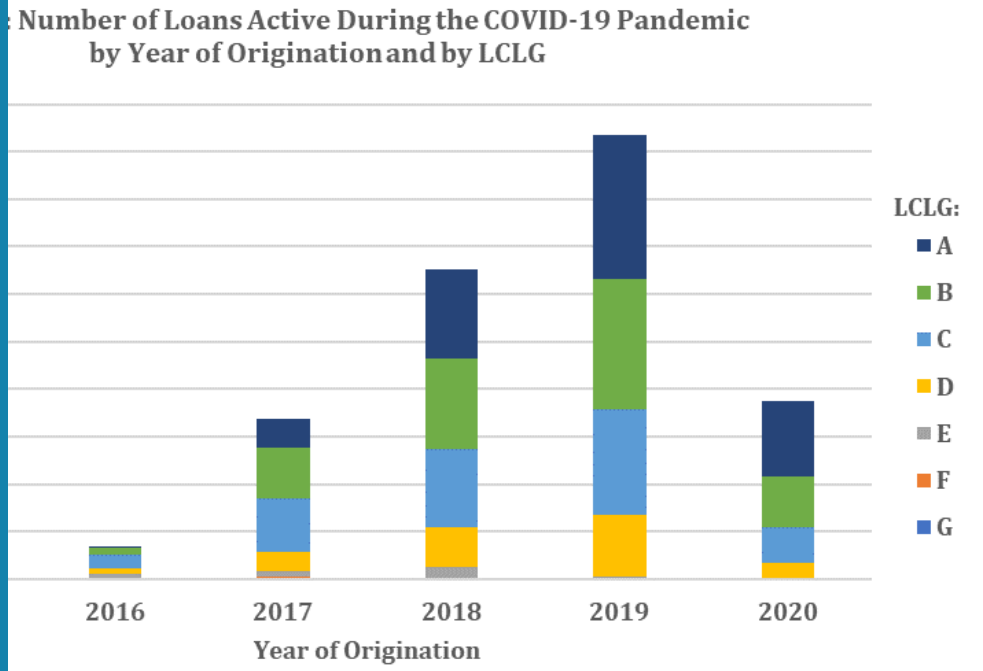
Credit card–level data from the **FRBNY Consumer Credit Panel/Equifax Data (CCP)** -- contains tradeline (account-level) data for all credit cards. This allows us to compare LendingClub loan default with the overall consumer default on credit cards during the COVID-19 pandemic.

Both the LendingClub and the CCP data sets are anonymized.

THERE ARE SIGNIFICANT NUMBER OF LOANS THAT ARE IN THE BELOW-PRIME OR NEAR-PRIME (A FICO SCORE BELOW 680 AND LCLG BELOW C-RATED) CLASSIFICATIONS ACROSS ALL ORIGINATION YEARS.

Dolson and Jagtiani (2023) also find that fintech lenders, in general, are more willing than traditional banks to offer credit to below-prime consumers.



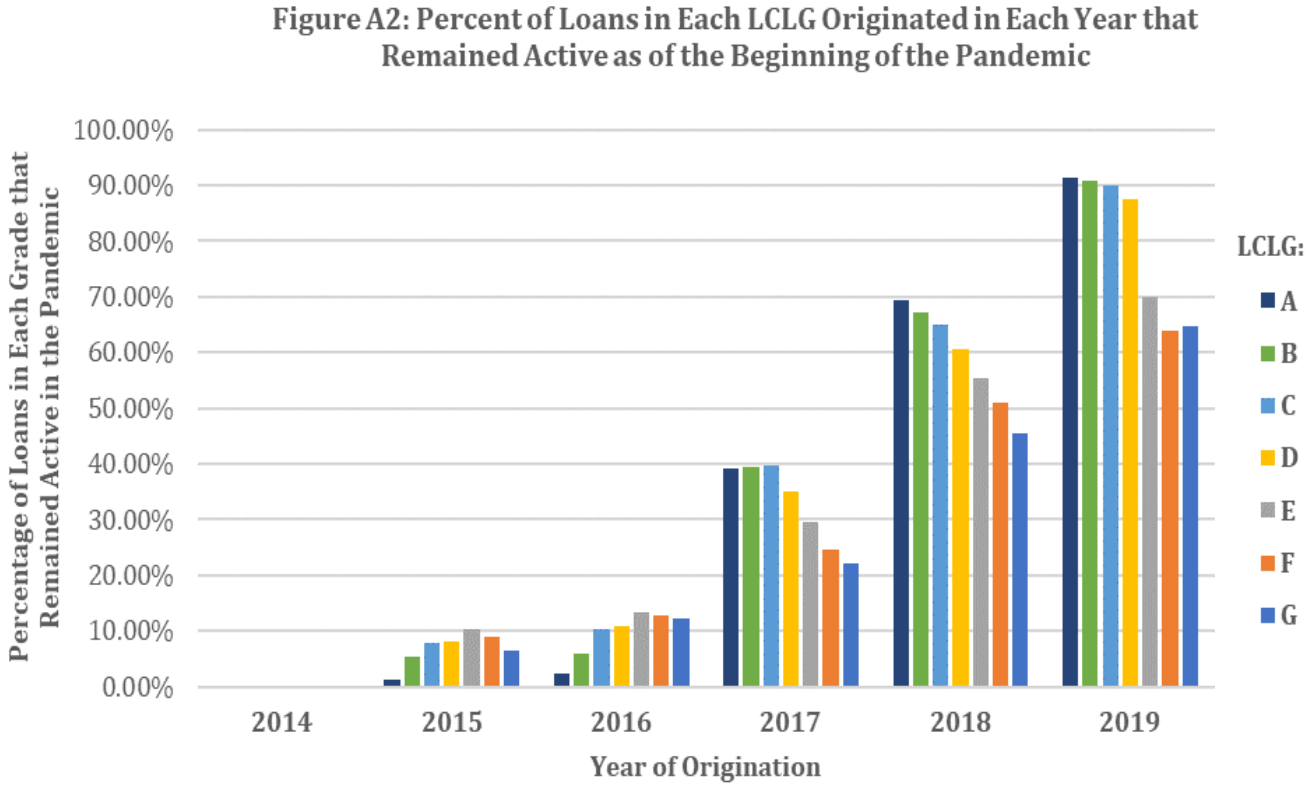


THE DATA: BREAKDOWN OF LOANS (THAT REMAINED ACTIVE AS OF THE START OF THE PANDEMIC) BY LCLG

About 90% (40%) of loans that LendingClub originated in 2019 (2017) remained outstanding as of the beginning of the pandemic period.

90% of A-rated loans that LendingClub originated in 2019 remained active as of the beginning of the pandemic.

65% of G-rated loans that LendingClub originated in 2019 were outstanding as of the beginning of the pandemic.



DO PROPRIETARY LOAN RATING SYSTEMS ACCURATELY PREDICT THE LIKELIHOOD OF DEFAULT?

Table 1 -- we find that there is a significant role for alternative data to play in boosting lenders' ability to accurately evaluate loan risk.

The coefficients of each of the LCLG dummies were significantly positive and in rank order (with a higher default rate for lower LCLGs).

This analysis further substantiates the graphical analysis and shows that the LCLG, which leverages alternative data, does add a significant lift in predicting loan default.

Interestingly, it also shows that FICO scores and LCLGs seem to contain "different" information, as the coefficients are simultaneously significant.

TABLE 1: PROBABILITY OF LENDINGCLUB LOANS BECOMING ≥ 60 DPD WITHIN 24 MONTHS OF ORIGINATION

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
FICO 720–759 at Origination	0.3504***	-	0.3498***	-	-	0.0565***
FICO 680–719 at Origination	0.7883***	-	0.7871***	-	-	0.1278***
FICO <680 at Origination	1.0955***	-	1.0933***	-	-	0.2276***
LCLG B-Rated at Origination	-	-	-	0.8109***	0.8102***	0.7623***
LCBG C-Rated at Origination	-	-	-	1.3722***	1.3717***	1.3019***
LCLG D-Rated at Origination	-	-	-	1.8143***	1.8142***	1.7326***
LCLG E-Rated at Origination	-	-	-	2.1594***	2.1598***	2.0768***
LCLG F-Rated at Origination	-	-	-	2.5112***	2.5114***	2.4255***
LCLG G-Rated at Origination	-	-	-	2.7369***	2.7377***	2.6489***
Home Price Index (3-Digit Zip Code)	-	+0.0000***	+0.0000***	-	0.0001***	0.0001***
Unemployment Rate (3-Digit Zip)	-	0.0125***	0.0092***	-	0.0068***	0.0063***
Business Bankruptcy (Per 1k in 3-Digit Zip)	-	385.585***	359.266***	-	531.238***	522.833***
Median Household Income (3-Digit Zip)	-	-0.0000***	-0.0000***	-	-0.0000***	-0.0000***
Initial Unemployment Claims (State)	-	+0.0000***	+0.0000***	-	+0.0000***	+0.0000***
2015 Origination	0.0851***	0.0963***	0.1021***	0.1371***	0.1527***	0.1527***
2016 Origination	0.1509***	0.1605***	0.1791***	0.2325***	0.2575***	0.2598***
2017 Origination	0.0960***	0.0816***	0.1387***	0.1728***	0.2094***	0.2174***
2018 Origination	0.0214***	-0.0285***	0.0791***	0.1609***	0.2102***	0.2250***
2019 Origination	-0.309***	-0.3497***	-0.2426***	-0.070***	-0.0153	-0.0009
Observations	2,527,856	2,527,856	2,527,856	2,527,856	2,527,856	2,527,856
Log-Likelihood	-8.44E+05	-8.54E+05	-8.43+05	-8.06E+05	-8.06E+05	-8.05E+05
Deviance	1.68E+06	1.707E+06	1.686E+06	1.61E+06	1.611E+06	1.610E+06
Pearson Chi-squared	2.530E+06	2.530E+06	2.530E+06	2.530E+06	2.530E+06	2.530E+06

LCLG PROPRIETARY RATING WAS ABLE TO IDENTIFY RISKY BORROWERS ON A MORE GRANULAR LEVEL THAN FICO DID.

Figure 1B: Percent of Accounts that Became ≥ 60 DPD Within 24 Months After Origination — by FICO Score (at Origination) and by Origination Year

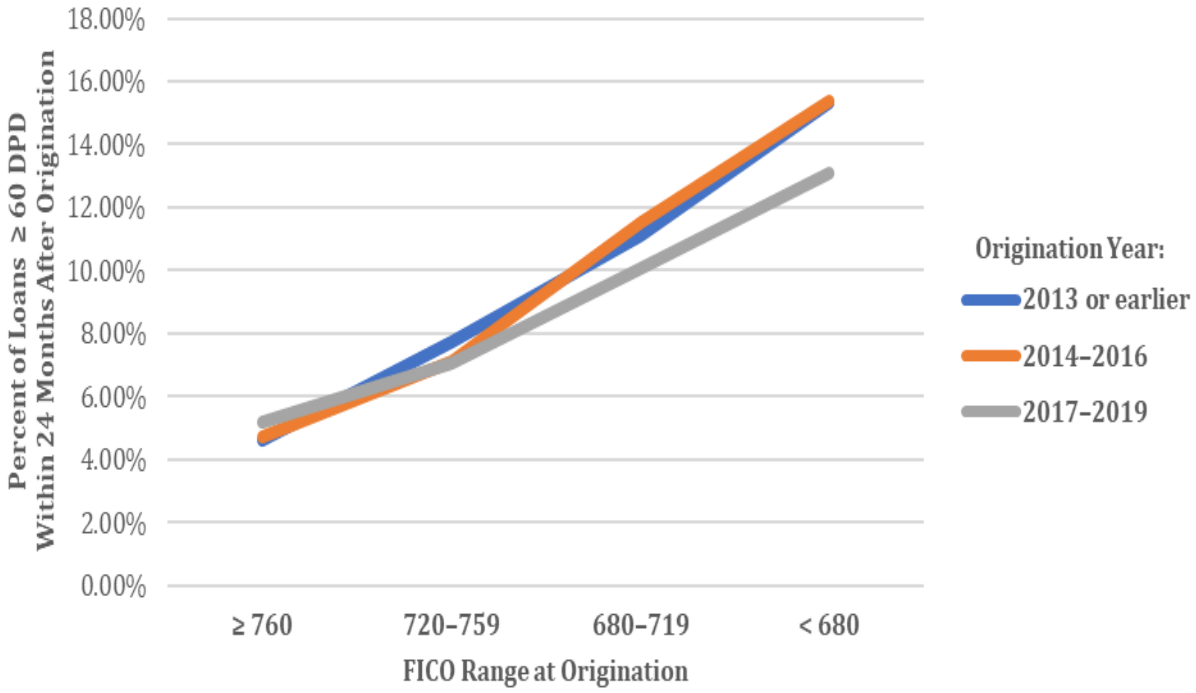


Figure 1D: Percent of Accounts that Became ≥ 60 DPD Within 24 Months After Origination — by LCLG (at Origination) and by Origination Year

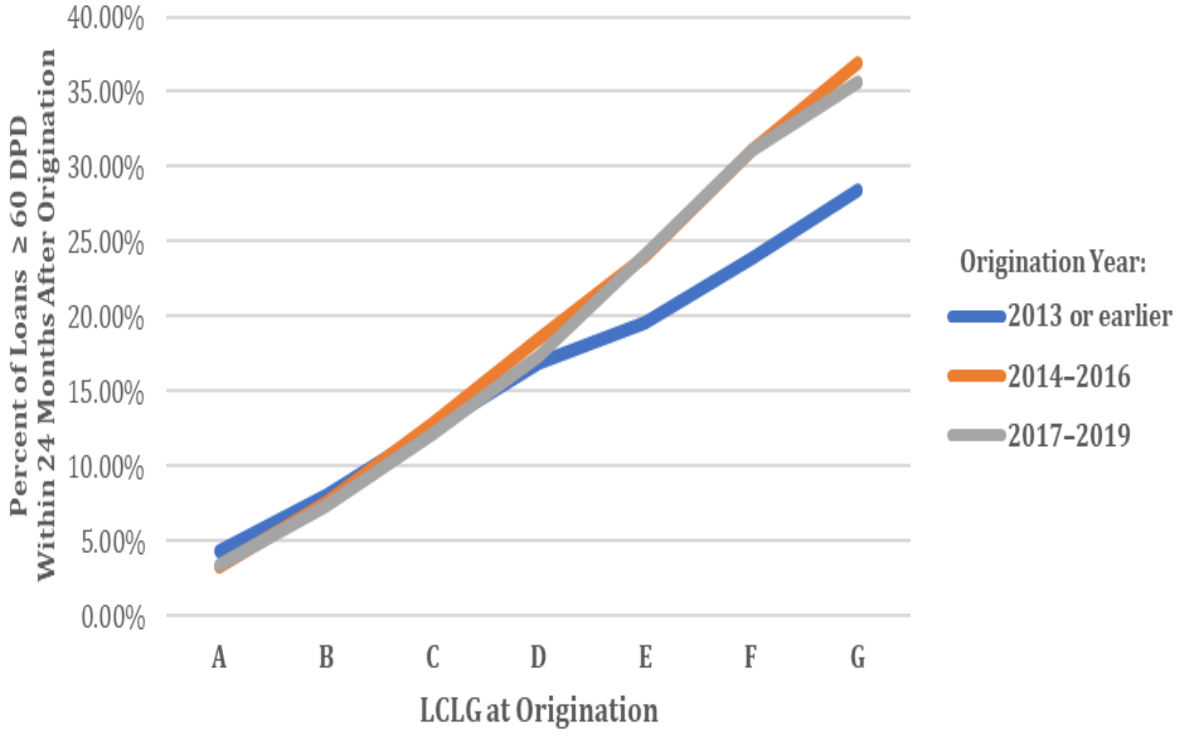


TABLE 3: PROBABILITY OF LENDINGCLUB LOANS BECOMING ≥ 60 DPD DURING COVID-19 PANDEMIC

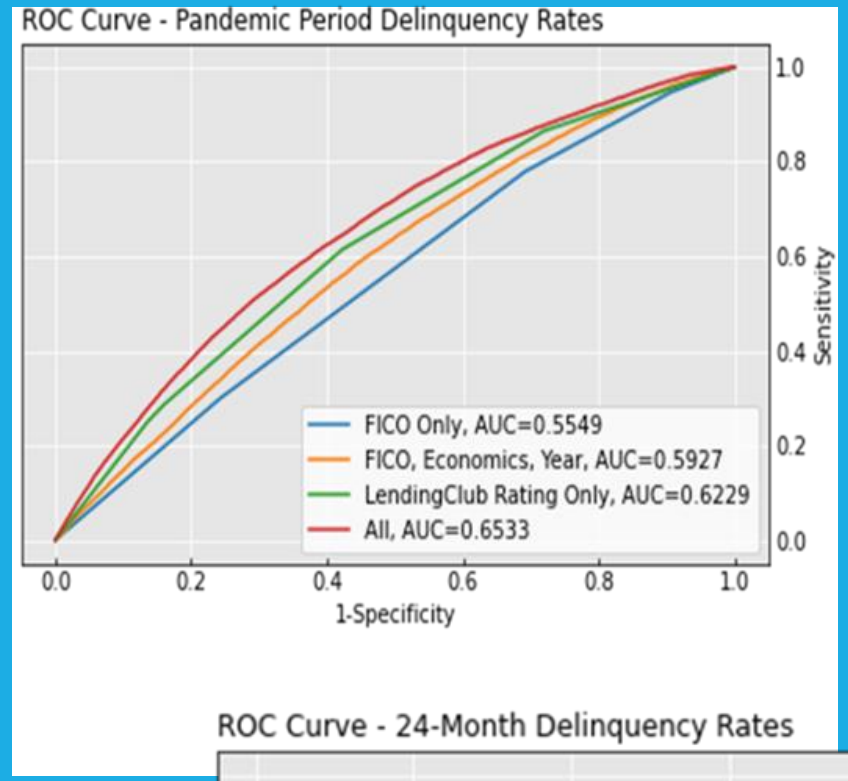
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
FICO 720–759 at Origination	0.3564***	-	0.3561***	-	-	0.1527***
FICO 680–719 at Origination	0.6672***	-	0.6665***	-	-	0.1736***
FICO <680 at Origination	0.8427***	-	0.8411***	-	-	0.1838***
LCLG B-Rated at Origination	-	-	-	0.6580***	0.6582***	0.6364***
LCLG C-Rated at Origination	-	-	-	1.0905***	1.0904***	1.0537***
LCLG D-Rated at Origination	-	-	-	1.4181***	1.4185***	1.3773***
LCLG E-Rated at Origination	-	-	-	1.5538***	1.5532***	1.5110***
LCLG F-Rated at Origination	-	-	-	1.8273***	1.8278***	1.7851***
LCLG G-Rated at Origination	-	-	-	1.9549***	1.9528***	1.9102***
Home Price Index (3-Digit Zip Code)	-	0.0001***	0.0001***	-	0.0002***	0.0002***
Unemployment Rate (3-Digit Zip)	-	0.0074	0.0055	-	0.0033	0.0032
Business Bankruptcies (Per 1k in Zip)	-	728.4145***	699.2566***	-	782.8709***	778.2914***
Median Household Income (3-Digit Zip)	-	-0.0000***	-0.0000***	-	-0.0000***	-0.0000***
Initial Unemployment Claims (State)	-	-0.0000***	-0.0000***	-	-0.0000***	-0.0000***
2015 Origination	-1.2441**	-1.2820**	-1.2390**	-1.0472**	-1.0465**	-1.0464**
2016 Origination	-0.5184	-0.5646	-0.5064	-0.3069	-0.3016	-0.2998
2017 Origination	-0.6664	-0.7303	-0.6488	-0.2530	-0.2453	-0.2453
2018 Origination	-0.1596	-0.2463	-0.1351	0.3166	0.3285	0.3298
2019 Origination	-0.0205	-0.1000	0.0102	0.5139	0.5293	0.5300
Observations	1,015,217	1,015,217	1,015,217	1,015,217	1,015,217	1,015,217
Log-Likelihood	-2.23E+05	-2.24E+05	-2.23E+05	-2.18E+05	-2.17E+05	-2.17E+05
Deviance	4.454E+05	4.481E+05	4.452E+05	4.351E+05	4.349E+05	4.348E+05
Pearson Chi-squared	1.020E+06	1.020E+06	1.020E+06	1.010E+06	1.010E+06	1.010E+06

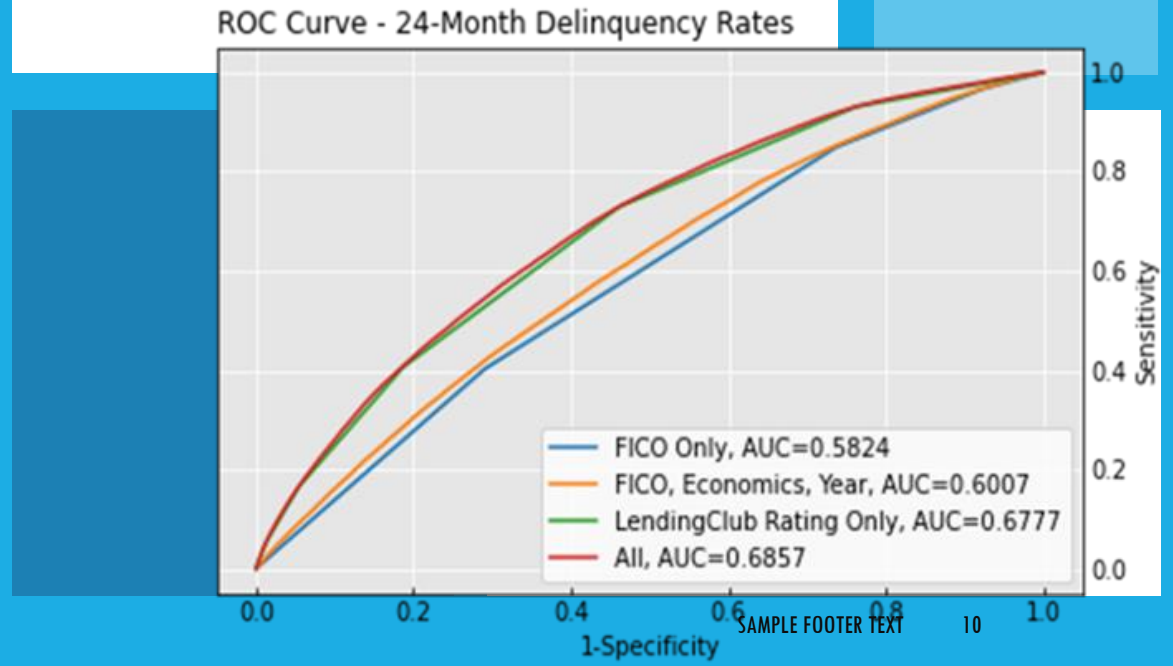
MODEL (1), WITH ONLY FICO BANDS, HAS THE LEAST PREDICTIVE POWER (ITS ROC IS CLOSEST TO THE 45-DEGREE LINE).

MODEL (4), WITH ONLY LCLGS, HAS MUCH GREATER PREDICTIVE POWER THAN MODEL (3), WHICH INCLUDES BOTH FICO BANDS AND LOCAL ECONOMIC FACTORS.

MODEL (6), WITH FICO BANDS, LOCAL ECONOMIC VARIABLES, AND LCLGS -- HAS THE STRONGEST PREDICTIVE POWER (SLIGHT IMPROVEMENT FROM (4).

This implies that, although LCLGs are much better at predicting defaults, FICO bands and/or local economic conditions seem to capture some default risk not captured by LCLGs.

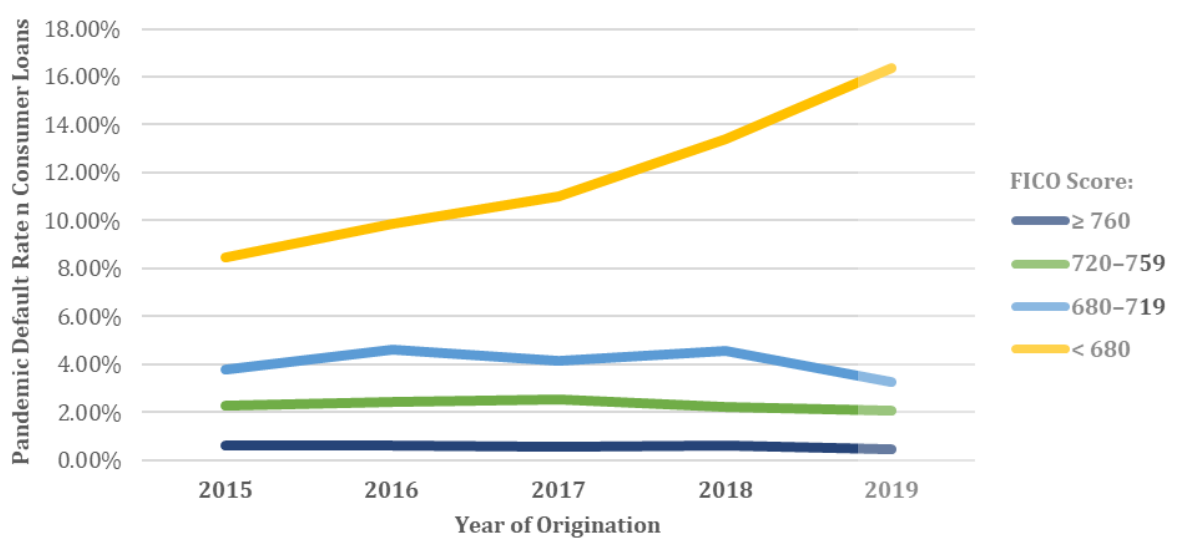




DEFAULT RATES ON CREDIT CARDS BASED ON FRBNY CONSUMER CREDIT PANEL/EQUIFAX DATA (CCP) VS. DEFAULT RATES ON LENDINGCLUB CONSUMER LOANS

Controlling for origination year and credit scores (Equifax Risk Score for credit card loans and FICO score for LendingClub loans).

Note: The default can occur at any time during the pandemic period.



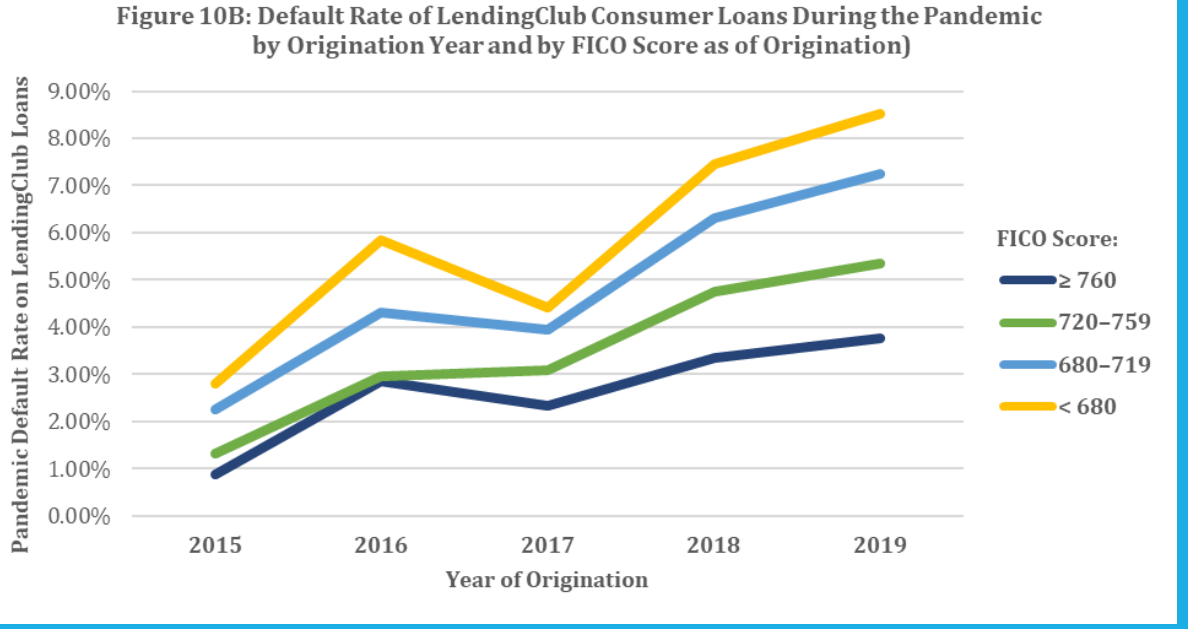


TABLE 4:

INTEREST RATES CHARGED BY LENDINGCLUB

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
FICO 720–759 at Origination	1.8243***	-	1.8233***	-	-	0.3177***
FICO 680–719 at Origination	4.5360***	-	4.5335***	-	-	0.5803***
FICO <680 at Origination	6.3288***	-	6.3228***	-	-	0.6160***
LCLG B-Rated at Origination	-	-	-	3.7210***	3.7205***	3.5942***
LCLG C-Rated at Origination	-	-	-	7.3062***	7.3055***	7.1268***
LCLG D-Rated at Origination	-	-	-	11.7624***	11.7615***	11.5628***
LCLG E-Rated at Origination	-	-	-	15.3263***	15.3255***	15.1283***
LCLG F-Rated at Origination	-	-	-	19.2595***	19.2586***	19.0590***
LCLG G-Rated at Origination	-	-	-	22.0002***	21.9996***	21.7952***
Home Price Index (3-Digit Zip Code)	-	-0.0002***	-0.0002***	-	-0.0000	-0.0000
Unemployment Rate (3-Digit Zip)	-	0.0471***	0.0257***	-	-0.0036***	-0.0045***
Business Bankruptcy (Per 1k in Zip)	-	-865.367***	-1034.339***	-	44.4616	17.4243
Median Household Income (in Zip)	-	-0.0000***	-0.0000***	-	-0.0000***	-0.0000***
Initial Unemployment Claims (State)	-	+0.0000	+0.0000	-	+0.0000***	+0.0000***
2014 Origination	0.8771***	1.4535***	0.7454***	-0.9397***	-0.9428***	-0.9700***
2015 Origination	-0.2097***	0.3409***	-0.3185***	-1.5921***	-1.5967***	-1.6247***
2016 Origination	0.5017***	1.0116***	0.4127***	-0.6809***	-0.6851***	-0.7070***
2017 Origination	0.2810***	0.5310***	0.2237***	-0.8438***	-0.8469***	-0.8470***
2018 Origination	-0.9197***	-0.9493***	-0.9506***	-1.5859***	-1.5876***	-1.5770***
Observations	1,670,528	1,670,528	1,670,528	1,670,528	1,670,528	1,670,528
Adjusted R-squared	0.174	0.025	0.175	0.916	0.916	0.917
AIC	9.740E+06	1.002E+07	9.738E+06	5.930E+06	5.930E+06	5.909E+06
BIC	9.740E+06	1.002E+07	9.739E+06	5.930E+06	5.930E+06	5.909E+06

TABLE 5:

INTEREST RATES CHARGED BY LENDINGCLUB — USING MORE GRANULAR FICO SEGMENTS

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
FICO 780–799 at Origination	0.5700***	-	0.5675***	-	-	0.1667***
FICO 760–779 at Origination	1.1530***	-	1.1522***	-	-	0.2766***
FICO 720–759 at Origination	2.5719***	-	2.5698***	-	-	0.5064***
FICO 680–719 at Origination	5.2836***	-	5.2800***	-	-	0.7696***
FICO <680 at Origination	7.0763***	-	7.0692***	-	-	0.8057***
LCLG B-Rated at Origination	-	-	-	3.7210***	3.7205***	3.5909***
LCLG C-Rated at Origination	-	-	-	7.3062***	7.3055***	7.1236***
LCLG D-Rated at Origination	-	-	-	11.7624***	11.7615***	11.5598***
LCLG E-Rated at Origination	-	-	-	15.3263***	15.3255***	15.1252***
LCLG F-Rated at Origination	-	-	-	19.2595***	19.2586***	19.0558***
LCLG G-Rated at Origination	-	-	-	22.0002***	21.9996***	21.7919***
Home Price Index (3-Digit Zip Code)	-	-0.0002***	-0.0002***	-	-0.0000	-0.0000
Unemployment Rate (3-Digit Zip)	-	0.0471***	0.0257***	-	-0.0036***	-0.0045***
Business Bankruptcy (Per 1k in Zip)	-	-865.367***	-1037.692***	-	44.4616	16.4962
Median Household Income (3-Digit Zip)	-	-0.0000***	-0.0000***	-	-0.0000***	-0.0000***
Initial Unemployment Claims (State)	-	0.0000	0.0000	-	0.0000***	0.0000***
2014 Origination	0.8785***	1.4535***	0.7468***	-0.9397***	-0.9428***	-0.9694***
2015 Origination	-0.2077***	0.3409***	-0.3164***	-1.5921***	-1.5967***	-1.6240***
2016 Origination	0.5043***	1.0116***	0.4153***	-0.6809***	-0.6851***	-0.7061***
2017 Origination	0.2848***	0.5310***	0.2276***	-0.8438***	-0.8469***	-0.8457***
2018 Origination	-0.9167***	-0.9493***	-0.9474***	-1.5859***	-1.5876***	-1.5761***
Observations	1,670,528	1,670,528	1,670,528	1,670,528	1,670,528	1,670,528
Adjusted R-squared	0.174	0.025	0.175	0.916	0.916	0.917
AIC	9.739E+06	1.002E+07	9.737E+06	5.930E+06	5.930E+06	5.908E+06
BIC	9.739E+06	1.002E+07	9.737E+06	5.930E+06	5.930E+06	5.909E+06

SPREAD RESIDUAL VARIABLE

- There is an additional factor that goes into the risk pricing of LendingClub loans but that was not captured by either the FICO scores or the LCLG ratings.
- This factor could be captured in the error term — so-called "Spread Residual"

We estimate the Spread Residual using 3 different specifications:

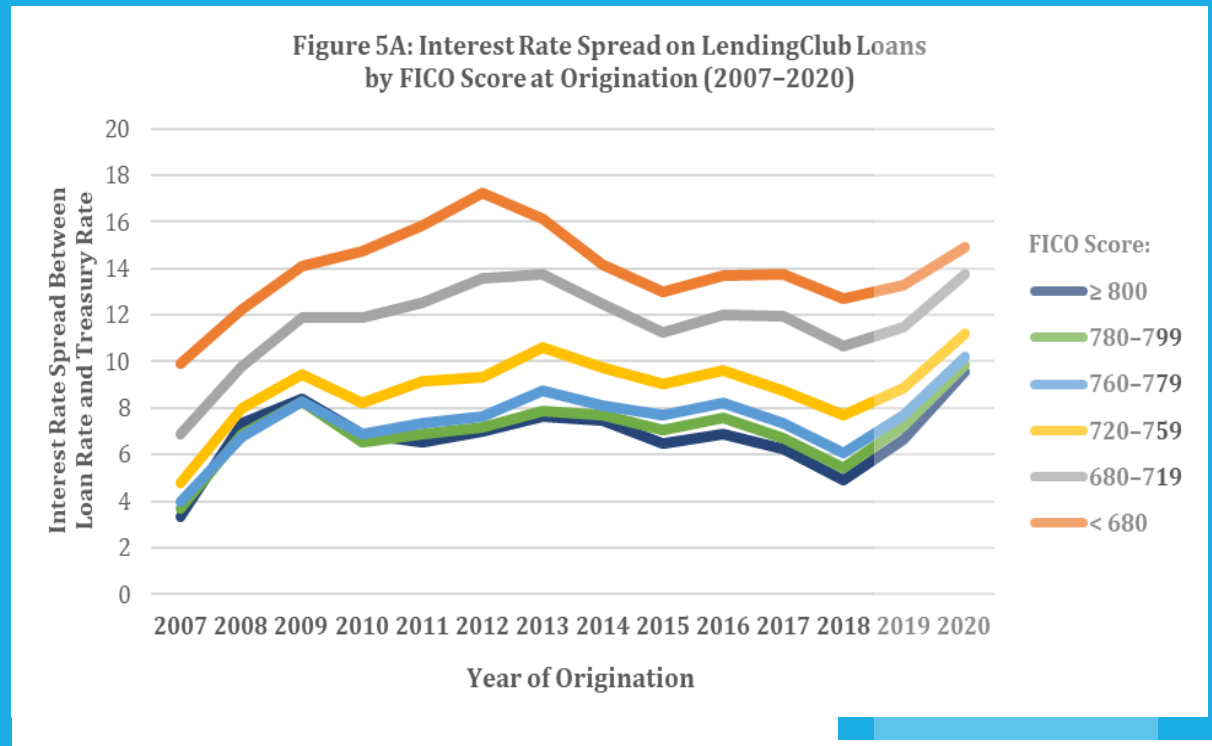
1) Interest Rate Spread = a + b(Year Dummies) + c(FICO Dummies) + g(Economic Factors) + Spread Residual
2) Interest Rate Spread = a + b(Year Dummies) + d(LCLG Dummies) + g(Economic Factors) + Spread Residual
3) Interest Rate Spread = a + b(Year Dummies) + c(FICO Dummies) + d(LCLG Dummies) + g(Economic Factors) + Spread Residual

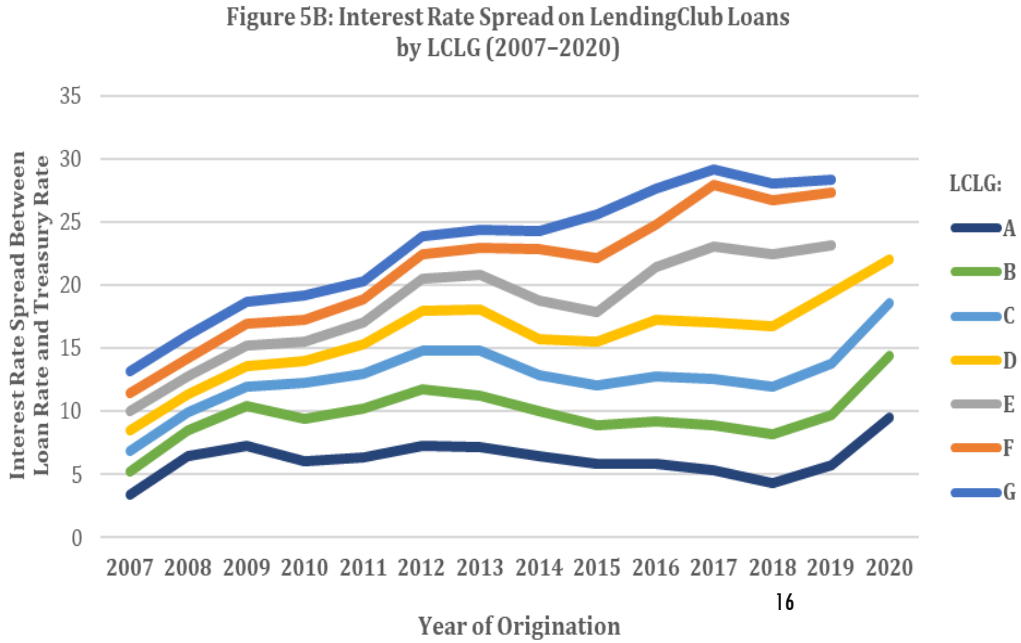
TABLE 6: THE ROLE OF INTEREST RATE SPREAD RESIDUAL IN DETERMINING DEFAULT PROBABILITY

VARIABLES	(1)	(2)	(3)	(1')	(2')	(3')
FICO 720–759 at Origination	0.3556***	-	0.0609***	0.3217***	-	0.0616***
FICO 680–719 at Origination	0.7929***	-	0.1345***	0.7420***	-	0.1347***
FICO <680 at Origination	1.1026***	-	0.2383***	1.0648***	-	0.2369***
LCLG B-Rated at Origination	-	0.8158***	0.7647***	-	0.8144***	0.7636***
LCLG C-Rated at Origination	-	1.3728***	1.2994***	-	1.3712***	1.2982***
LCLG D-Rated at Origination	-	1.8222***	1.7362***	-	1.8182***	1.7329***
LCLG E-Rated at Origination	-	2.1565***	2.0697***	-	2.1386***	2.0531***
LCLG F-Rated at Origination	-	2.5240***	2.4335***	-	2.5062***	2.4171***
LCLG G-Rated at Origination	-	2.7389***	2.6463***	-	2.7277***	2.6362***
Home Price Index (3-Digit Zip Code)	+0.0000***	0.0001***	0.0001***	+0.0000***	0.0001***	0.0001***
Unemployment Rate (3-Digit Zip)	0.0084***	0.0054*	0.0049*	0.0083***	0.0053*	0.0048*
Business Bankruptcies (Per 1k in Zip)	296.8013***	462.0375***	455.5369***	323.8872***	460.5209***	453.439***
Median Household Income (3-Digit Zip)	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
Initial Unemployment Claims (State)	+0.0000***	+0.0000***	+0.0000***	+0.0000***	+0.0000***	+0.0000***
2015 Origination	0.1057***	0.1621***	0.1621***	0.1070***	0.1567***	0.1569***
2016 Origination	0.1791***	0.2645***	0.2665***	0.1523***	0.2301***	0.2336***
2017 Origination	0.1295***	0.2128***	0.2213***	0.0860***	0.1650***	0.1759***
2018 Origination	0.0686***	0.2073***	0.2223***	0.0218*	0.1556***	0.1731***
2019 Origination	-0.2382***	-0.0049	0.0100	-0.2855***	-0.0688***	-0.0513***
Spread Residual	-	-	-	0.1128***	0.0674***	0.0650***
Observations	1,670,528	1,670,528	1,670,528	1,670,528	1,670,528	1,670,528
Log-Likelihood	-5.610+05	-5.362E+05	-5.359E+05	-5.368+05	-5.353E+05	-5.351E+05
Deviance	1.122E+06	1.072E+06	1.072E+06	1.074E+06	1.071E+06	1.070E+06
Pearson Chi-squared	1.670E+06	1.670E+06	1.670E+06	1.630E+06	1.670E+06	1.670E+06

BORROWERS WITH TOP FICO SCORES DID NOT GET UNREASONABLY LOW INTEREST RATES FROM LENDINGCLUB.

No evidence that A-rated or B-rated borrowers were charged disproportionately lower interest rates than other borrowers.
Overall, we find no evidence of cream-skimming so far.





- **The proprietary loan rating system contained different information than the traditional measure of credit risk, FICO. The two measures have a low correlation, and the inclusion of both in the regression analysis improved the fit of the model.**
- **Local economic variables were significant in the default prediction model.**
- **There is additional variation in defaults that was picked up by a unique factor (unrelated to the proprietary LCLG rating, the FICO score, or the local economic factors), the so-called "spread residual" variable.**

KEY FINDINGS

THE SPREAD RESIDUAL IMPLICATIONS

Our results show that some variations in the interest rate charged to consumers with similar LCLGs are also highly correlated with loan default, despite these variations being uncorrelated with credit scores, LCLGs, or economic factors.

The "spread residual," is not captured by the typical credit risk model (but important in determining a loan's default), is likely a reason why previous studies could have mistakenly misinterpreted the interest rate spread as potentially unfair pricing that favors a certain group of customers.

We reject the fintechs' cream-skimming hypothesis. There is no evidence of fintech lenders cream-skimming and offering unusually low interest rates on loans to "better" borrowers.