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Ziyu (Christina) Ye April 7, 2020

The Relationship Between Big4 Bank Lending Shares and Peer-to-Peer Loan Applications Across Different Regions and the Changes in the Percentage of Low Credit Borrowers in the Context of Regulatory Changes

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Abstract

The Relationship Between Big4 Bank Lending Shares and Peer-to-Peer Loan Applications Across Different Regions and the Changes in the Percentage of Low Credit Borrowers in the Context of Regulatory Changes

By Ziyu (Christina) Ye

The introduction of the Dodd-Frank Act in 2010 increased the regulatory burden and compliance costs of large banks and traditional credit borrowing became nearly impossible for individuals and small businesses to access. Thus, consumers started to switch to online lending platforms. During the same period, the total amount of credit applied by borrowers on Lending Club, a Peer-to-Peer FinTech (P2P) lender, increased from 51 million in 2009, to 6.6 billion in 2017. The regression result shows a statistically significant relationship between the increase in the total sum of loans applied for by borrowers on Lending Club and the decrease in Big4 shares. The significant increase in P2P loan applications also increased the default risk. This paper examines the default risk through analyzing the average FICO score and delinquency rate of credit borrowers in Lending Club. The credit score decreased from 694.4 in 2009 to 676.3 in 2014 and increased back to 689.8 in 2017. The delinquency increased from 13.4% in 2009 to 36.1% in 2016, and then decreased to 32.6% in 2017. These changes in credit scores and delinquency rates are explained by the regulatory changes. The initial introduction of the Dodd-Frank Act caused more low credit borrowers to switch to P2P lending and, when the Consumer Financial Protection Bureau (CFPB) started to microscope P2P lending in 2016, the number of low credit borrowers decreased. This shows that the CFPB is a suitable regulator for P2P industry.

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Contents

1 Introduction

Mortgage credit supply has undergone major changes since the 2008 financial crisis. Mortgage lending market share by the four largest banks (Big 4), Citibank, Chase, Banks of America, and Wells Fargo, dropped from 34% to 19% from 2009-2017 following the crisis-related fines and heightened regulatory burden. In the mean time, online platforms known as Peer-to-Peer lenders started to appear attractive to both borrowers and lenders in the lending market.

This paper examines how Peer-to-Peer (P2P) lending responds to the decrease in Big4 share. I explore the relationship between the total sum of loans applied for by borrowers on Lending Club and Big4 share by performing fixed effect/within estimation regressions using 3-digit zip code panel data from 2007 to 2017. The results show that the coefficients of Big4 share, first difference of Big4 share, and percentage change of Big4 share in three regression specifications are all statistically significant. This suggests that the increase in Peer-to-Peer loan applications is correlated with the decrease in Big4 share.

Because the increase in P2P loan applications also increased regulation concerns after the introduction of the Dodd-Frank Act in 2010, this paper also analyzes the investor risks and regulation changes. On the one hand, Peer-to-Peer lending offers convenience and improves market efficiency as it eliminates the middleman. On the other hand, this new system is inadequately regulated, causing concerns from both investors and borrowers. This paper specifically focuses on risks for lenders. The largest concern for lenders is whether or not borrowers are able to pay back the debt. I explore the trend of the average credit scores of P2P loan applicants and delinquency rates between 2009 and 2017 in order to analyze the quality of borrowers. This paper finds that the average credit scores decreased from 2009 to 2014 and then increased from 2015 to 2017. Delinquency rate increased from 2009 to 2014 and then decreased from 2015 to 2017. To explain the increase and decrease in average credit scores and delinquency rates and find loopholes in regulation, I further examine the current regulator and changes in P2P regulation over the years. The initial introduction of the Dodd-Frank Act caused more low credit borrowers to switch to P2P lending, and SEC is unable to provide sufficient regulations for this relatively new industry. When the Consumer Financial Protection Bureau (CFPB) started to microscope P2P lending in 2016, the average credit score increased; this shows that the CFPB is a suitable regulator for P2P lending.

This paper is structured as follows. Section 3 presents the findings from related literature. Section 4 includes the data and summary statistics. Section 5 includes the results generated from regressions. Section 6 analyzes the results in the context of regulation changes and discusses the possible extensions and limitations from the paper. In section 7 I discuss conclusions.

2 Related Literature

Uber, Airbnb, and eBay connect buyers and sellers of goods and services over the Internet, making the market more efficient. Similarly, financial technology (FinTech) has made similar developments in the financial sector, allowing providers and users of finance to interact directly without the involvement of banks and other financial intermediaries. Peer-to-peer (P2P) lending markets were created to allow consumers to request small loans online and creditors to evaluate and directly fund loan applications of their choosing (Balyuk, Tetyana, and Davydenko, 2018). [1] It can be defined as any transaction arranged using the Internet in which one or more individuals lend money to one or more other individuals (Chaffee and Rapp, 2012). [5]

P2P lending market in the U.S. is arguably neither peer-to-peer, nor a lending market in which creditors choose to whom to lend. Pure online P2P lending would be structured without an intermediary. Ideally, borrowers register with the platform and complete a loan application. Investors then review loan requests and determine which to fund. However, the P2P platforms in the US requires an intermediary, which is the platform itself, such as Prosper and Lending Club to complete the process. When a borrower applies for a loan, the platform decides whether the loan should be funded or screened out and sets the interest rate, and then transfers investors' money to fund the loan, with little to no human involvement throughout the process (Balyuk, Tetyana, and Davydenko, 2018). [1] Instead of simply serving as a meeting place for borrowers and lenders, the lending platform performs all tasks related to loan origination, except for providing the funds.

After the introduction of the Dodd-Frank Act following the crisis, consumers started to switch from borrowing from large banks to smaller banks and FinTech lenders. Similar to traditional lending in banks, the interest rate of FinTech lenders for a loan is set by the site according to its analysis of the borrower's credit history, credit score, income, debt, and other factors. And all borrowers must meet certain minimum credit criteria, and interest rates vary between 7% and 21% (Chaffee and Rapp, 2012). [5] FinTech companies have targeted the consumer credit market, which is one of the largest credit markets, with outstanding credit of $3.8 trillion in 2018 (Federal Reserve Bank of New York, 2018). [7] Following crisis-related fines and heightened regulatory burden, mortgage lending by big four banks decreased by 7% of the market from 2009-2013, with the gap filled by small banks and FinTech lenders as these lenders continued to grow following the crisis (Begley and Srinivasan, 2019). [2] Some literature suggest that small banks have been the main supplier of credit in the areas where the Big4 banks had the largest pullback of lending (Begley and Srinivasan, 2019). [3] This paper focuses on how Peer-to-Peer lending changed responding to big4 retreat.

Peer-to-Peer (P2P) lending is a relatively new financial technology platform with regulation arbitrage. Currently, it is regulated by the SEC, which means that P2P lenders are in the position of either registering

the loans or finding an exemption to Section 5 of the 33 Act (Warren, 2015). [10] The Dodd-Frank Act — named for its sponsors, Sen. Chris Dodd and Rep. Barney Frank — was signed into law in 2010 in response to the actions that sparked the financial crisis. The law was passed for four primary purposes. First, to promote financial stability; second, to improve accountability and transparency in the U.S. financial system; third, to end the perception of some financial institutions being "too big to fail"; fourth, To protect American consumers from abusive practices by financial service providers (Bieber, 2019). [4] Not only adding restrictions to banks, the Dodd-Frank Act also tried to regulate online platforms. It proposed to move rulemaking and enforcement authority to the CFPB to better consolidate the regulation of P2P lending, but no further actions have been taken until 2016 when the CFPB started to accept complaints from P2P consumers (Manbeck and Hu, 2014). [6] This paper focuses how the regulation changes affect the number of low credit borrowers in P2P lending.

3 Data and Summary

The first section describes where the data used for analysis is obtained and second section presents the summary statistics.

3.1 Data Availability

The Peer-to-Peer lending data is accessed from Lending Club investor portal which is available for research. The datasets are available at the first 3-digit zip code level and it contains borrowers' ID on the platform, loan amount, interest rate, installment, loan grade, loan issue date, loan status, loan purpose, address state, delinquency times in 2 years and last 6 months, and borrowers' Fico score. Lending Club data is used in the analysis for the following two reasons. First, it is one of the few lender platforms that publish their data. Second, it is one of the larger FinTech lenders in the market, so it could better represent the broad trend in this industry.

Mortgage originations data are from the Home Mortgage Disclosure Act (HMDA) database. It includes all originated loan data from 2007 to 2017. In the analysis, I include all loan applications whose purpose was either home purchase or refinancing. I classify HMDA lenders into non Big4 lenders and Big4 banks, including Citibank, Wells Fargo, Chase, and Bank of America. Some related literature used this database to get the county level data for big four lending market shares (Begley and Srinivasan, 2019). [2] Since HMDA data is available at county level and Lending Club data is available at first 3 digits zip code level, I merge the county level data to 3-digit zip code level by matching zip codes with county FIPS codes. The final dataset is a 3-digit zip code-year panel containing loan amount, interest rate, loan grade, purpose, and borrowers'

FICO scores from 2007-2017.

The control variables unemployment rate and county-level GDP are collected from the U.S. Bureau of Labor Statistics and the Bureau of Economic Analysis respectively. The county-level demographics are matched to 3-digit zip code-year panel data using county FIPS code as well.

3.2 Summary Statistics

Table 1 presents the county-level summary statistics of Lending Club's borrowers. It includes annual income, FICO credit score, loan amount, funded amount and delinquency times. I first examine the loan origination trends in Big 4 and Lending Club. Figure 1 presents the the Big4 share in mortgage loan from 2007 to 2017 according to the total sum of loan applied by borrowers. Figure 2 shows the the Big4 share in mortgage loan from 2007 to 2017 according to the total number of loan applied by borrowers. The trends are similar and the Big4 Share decreased from 34% in 2009 to 15% in 2017. Figure 3 shows the growth of Lending Club. The total amount of credit applied by borrowers on Lending Club increased from 51 million in 2009 to 6.6 billion in 2017. Figure 4 shows the Lending Club loan share. It first increased from 2005 to 2014, and then dropped from 2015 to 2017.

Then, the second step is to compare the trends in which Big 4 banks have low presence and the trends in which Big 4 banks have high presence. Low presence region is defined as the region that has low Big4 shares and high presence region is defined as the region that has high Big4 shares. Figure 5 shows the comparison in Lending Club's total sum of loan applications and figure 6 shows the comparison in Lending Club's year-over-year growth rate. From 2010 to 2012, regions with high big4 presence has higher total P2P loan applications and higher growth rate. After 2015, Lending Club loan applications in regions with low Big4 share continued to grow while regions with high Big4 share started to decrease.

Figure 7 shows the average credit score of loan applicants from 2007 to 2017. The average credit score decreased from 694 in 2009 to 676 in 2015 and then increased back to 689 in 2017. Figure 8 presents the delinquency rate changes. The delinquency increased from 13.4% in 2009 to 36.1% in 2016, and then decreased to 32.6% in 2017.

4 Results

4.1 Lending Club Loan Applications Response to Big4 Share Changes

The relationship between the log value of Lending Club loan amount and Big4 share is examined in the regression specified as below:

$$log\_LendingClub_{it} = \beta_0 + \beta_1 Big4share_{it} + \beta_2 GDP_{it} + \beta_3 unemrate_{it} + u$$

Table 2 shows the regression result of the fixed effect within estimation from this specification. Coefficients of Big4share in both column 1 and column 2 are statistically significant. It indicates that Lending Club loan application is sensitive to changes in origination share of the Big4, when controlling GDP and unemployment rate. Decrease in 1 percent Big4 share corresponds to 3.8% increase in Lending Club loan applications. R-squared increases as the control variables are added to the regression. GDP is positively correlated with Big4share while unemployment rate is negatively correlated with Big4 share.

We further examine the relationship between log value of Lending Club loan amount and percentage change in Big4 share as specified:

$$log\_LendingClub_{it} = \beta_0 + \beta_1 Big4share\_change_{it} + \beta_2 GDP_{it} + \beta_3 unemrate_{it} + u$$

Table 3 shows the regression result of the fixed effect within estimation from this specification. Coefficients of Big4share percentage change in both column 1 and column 2 are still statistically significant. It indicates that Lending Club loan application is sensitive to percentage changes in origination share of the Big4, when controlling GDP and unemployment rate. Decrease in 1 unit of percentage change in Big4 share corresponds to 0.0121% increase in Lending Club loan application. R-squared increases as the control variables are added to the regression.

In the next 2 regressions, I used the lagged value (1 year) of Big4 share as an independent variable to avoid endogeneity issue. To ensure consistency, I used the percentage changes and first difference for all independent variables as specified below:

$$log\_LendingClub_{it} = \beta_0 + \beta_1 Big4share\_change1_{it} + \beta_2 GDP\_change_{it} + \beta_3 unemrate\_change_{it} + u$$

$$D.log\_LendingClub_{it} = \beta_0 + \beta_1 D.Big4share1_{it} + \beta_2 D.log\_GDP_{it} + \beta_3 D.unemrate_{it} + u$$

Table 4 presents the result of regression using percentage changes of variables and Table 5 presents the result of regression using first differences. In both specifications, the change in Big4share is statistically significant. The results are the same as the previous regressions as Big4 share and LendingClubSum are negatively correlated with each other. Decrease in Big4 share corresponds to increase in Lending Club loan applications. Specifically, if a region's Big4 share decrease is one percentage point larger than another region, the P2P loan application would increase by 2.3%.

4.2 Average Credit Score and Delinquency Rate Response to Big4 Share Changes

The relationship between percentage change in average credit score of Lending Club loan applicants and percentage change in lagged value of Big4 share is examined in the regressions specified as below:

$$creditScoreAverage_{it} = \beta_0 + \beta_1 Big4shareL1_{it} + \beta_2 GDP_{it} + \beta_3 unemrate_{it} + u$$

Table 6 shows the regression result of this specification and Table 7 shows the similar regression result from the first differences of the variables as below:

$$D.log\_creditScoreAverage_{it} = \beta_0 + \beta_1 D.Big4shareL1_{it} + \beta_2 D.GDP_{it} + \beta_3 D.unemrate_{it} + u$$

Coefficients of Big4share change in both column 1 and column 2 are statistically significant. In column 1, without controlling for GDP and unemployment rate, increase in one percent in the lagged value of Big4 share corresponds to 1.725 points decrease in average credit score. In column 2, after including the control variables, 1 percent increase in big4 share corresponds to 38 points decrease in average credit credit. It contradicts with the assumption that the average FICO credit score of borrowers is negatively correlated with the change in Big4 share. This result indicates that with the decrease in Big4 share, less low credit borrowers switched to Peer-to-Peer lending. This result can be explained by the change in credit score over years because there was an overall credit score increase since 2015 as the economy became better. There are other factors affecting the average credit scores which are unable to control in this regression analysis.

Table 8 shows the regression result of the specification below

$$Delinquency\_rate_{it} = \beta_0 + \beta_1 Big4share\_changeL1_{it} + \beta_2 GDP\_change_{it} + \beta_3 unemrate\_change_{it} + u$$

The result indicated that when the percentage change in Big4 share decreases by 1 unit, delinquency rate goes up by 0.0675. The coefficient of the percentage change of Big4 share is statistically significant which

means that there is a significant negative correlation between delinquency rate and changes in Big4 share.

The next step is to test if the existence of the Dodd-Frank Act affect the total sum of loan applications on Lending Club. I add the time dummy variable regulation and it equals to 1 if the year is from 2010-2015. The interaction term between the big4 share and the time dummy variable is added as well as specified below.

$$\log\_\text{LendingClub}_{it} = \beta_0 + \beta_1 Big4share\_changel1_{it} + \beta_2 GDP\_change_{it} + \beta_3 unemrate\_change_{it}$$
$$+ regulation_{it} + Big4\_Regulation_{it} + u$$

Table 9 presents the result of this regression. One unit decrease in Big4 share corresponds to 0.007 percent increase in the sum of loan applications on Lending Club. It shows that if the big4-regulation interaction term is negative, which means that during 2010-2015, with Dodd-Frank Act and P2P under the regulation of SEC, there's a negative correlation between percentage change of big4share and lending club loan applications.

5 Discussion

The first section discusses the results in the context of the changes in regulation, and the second section showcases the limitations of this paper and potential extensions.

5.1 Results and Regulation

The results indicate that the decreasing Big4 mortgage lending share after the Dodd-Frank Act increased the demand for Peer-to-Peer lending. Decrease in 1 percent Big4 share corresponds to 3.8% increase in Lending Club loan applications. In the same time, the trend in Figure 6 shows that the average credit scores of Peer-to-Peer borrowers decreased and delinquency rate increased from 2009 to 2015, which suggests that more low credit borrowers entered Peer-to-Peer lending after the Big4 retreat, increasing the potential default risks. Therefore, these changes in lending landscape require new adequate regulations to ensure the sustainability of this online lending system.

The decrease in average credits scores and the increase in delinquency rate from 2009 to 2015 can be potentially explained by the increasing number of low credit borrowers entering P2P lending after the Dodd-Frank Act because of the lack of appropriate P2P regulations. Although Peer-to-Peer lending offers convenience and market efficiency by cutting out the middleman services provided by the intermediating banks, the regulatory responses to this relatively new industry were still inadequate (Warren, 2015). [10] There are two major types of risks: lenders' concerns about getting the money back and borrowers' concerns

of their privacy issues (Verstein, 2011). [9] Peer-to-Peer lending under the SEC's regulation is an ill-fitting framework for this industry. The Dodd-Frank Reform proposed to move P2P lending from the SEC to the CFPB; however, no actions have been taken until 2016. Before 2016, P2P lending was only regulated by the SEC, and the SEC only focuses on a narrower mandate that protects investors through disclosure requirements (SEC, 2013). [8] These protections are inflexible and would increase lenders' risks. It lacks the mandate to monitor web pages and set substantive advertising standards (Verstein, 2011). [9] The lack of adequate regulations of small loans and lack of transparent information about potential P2P risks led to increase in investor risks. Also on the borrower's side, The SEC does not help borrowers solve their concerns, including privacy issues and limited access to capital.

The potential policy recommendation would be to let CFPB as its sole regulator since the CFPB would be more familiar with individual consumers' issues and develop tailored and flexible regulations for the P2P industry. The data can also prove that the CFPB is a better regulator. As more consumers entered P2P lending after the Dodd-Frank Act, the number of low credit borrowers continued to increase as the average credit scores of P2P loan applicants decreased and the delinquency rate increased from 2009 to 2015. However, starting from 2016, when the the CFPB began to put P2P lending under microscope by accepting consumer complaints from P2P platforms, the average credit score of borrowers increased and the delinquency rate decreased. As consumers got better protections from the CFPB and became more informed about the risks and benefits they would be getting from P2P lending, the quality of borrowers improved and default risk was mitigated. It shows that CFPB could serve as a better regulator, covering the aspects that the SEC is unable to cover.

5.2 Limitations and Future Works

This paper has several limitations. First, This paper only focuses on the general relationship between Lending Club loan applications and Big4 share before and after the introduction of the Dodd-Frank Act. Because of the data constraints, I was unable to collect the Big4 share in 2009 for all 3-digit zip code areas. For future work, Big4 share in a certain year can be used as an instrumental variable for the Dodd-Frank Act and measure the effect of the Dodd-Frank Act on Peer-to-Peer lending more accurately. Second, since the zip code areas and county areas are not perfectly 1 to 1 matching, I took some compromising approaches when matching datasets. As a result, the results presented might not be as accurate as using consistent area level, such as using all county-level data. Third, future works might consider including the effects of pandemic on Peer-to-Peer lending. With the ongoing COVID-19 pandemic, jobless claims surge tremendously which might potentially increase financial burden of borrowers who might be unable to pay back the debt on time.

The economic uncertainties and decrease in interest rate may reduce the number of investors, and these topics are worth researching for future works.

6 Conclusion

With the increasing burden and restrictions for traditional banks, the Big4 mortgage lending share decreased from 34% in 2009 to 15% in 2017. In the mean time, more consumers switched to online P2P lending, with the total sum of loans applied for by borrowers on Lending Club increasing from 51 million in 2009 to 6.6 billion in 2017. Within estimation/fixed effect regressions are performed on 3-digit zip code panel data from 2007 to 2017 to examine the relationship between the sum of loans applied for by borrowers on Lending Club and Big4 shares. The results show a statistically significant negative correlation between these two variables, which proves that indeed more consumers switched from traditional bank lending to online P2P lending.

The increase in the total sum of loans applied for by borrowers on Lending Club causes concerns for investors whose main risk is the default risk. This paper examined the percentage of low credit borrowers through analyzing the average FICO score and delinquency rate of credit borrowers on Lending Club. It decreased from 694.4 in 2009 to 676.3 in 2014 and increased back to 689.8 in 2017. The regression result also show that there is a statistically significant negative correlation between the Big4 share and Lending Club's delinquency rate. The result can be can be explained by the regulatory changes. The initial introduction of the Dodd-Frank Act caused more low credit borrowers to switch to P2P lending, and SEC was unable to provide sufficient regulations for this relatively new industry. When Consumer Financial Protection Bureau (CFPB) started to microscope P2P lending in 2016, the average credit score increased and the delinquency rate decreased. This shows that the CFPB is a suitable regulator for P2P lending.

References

[1] Tetyana Balyuk and Sergei A. Davydenko. Reintermediation In Fintech: Evidence From Online Lending. *SSRN Electronic Journal*, 2018.

[2] T. Begley and K. Srinivasan. Small bank lending amidst the ascent of fintech and shadow banking: A sideshow? *SSRN Electronic Journal*, 2019.

[3] Taylor A. Begley and Kandarp Srinivasan. Small bank lending in the era of fintech and shadow banking: a sideshow? 2019.

[4] Christy Rakoczy Bieber. What is the dodd-frank act? 2019.

[5] Eric C. Chaffee and Geoffrey C. Rapp. Regulating online peer-to-peer lending in the aftermath of dodd–frank: In search of an evolving regulatory regime for an evolving industry. *Wash. & Lee L. Rev.*, 69, 2012.

[6] Peter Manbeck and Samuel Hu. *The Regulation of Peer-to-Peer Lending.* Chapman and Cutler LLP, 2014.

[7] Federal Reserve Bank of New York. Quarterly report on household debt and credit. 2018.

[8] U.S. Securities and Exchange Commission. 2013.

[9] Andrew Verstein. The misregulation of person-to- person lending. *University of California, Davis*, 45(445), 2011.

[10] WILLIAM S. WARREN. The frontiers of peer-to-peer lending: Thinking about a new regulatory approach. *DUKE LAW TECHNOLOGY REVIEW*, 14(1), 2015.

A Figures and Tables

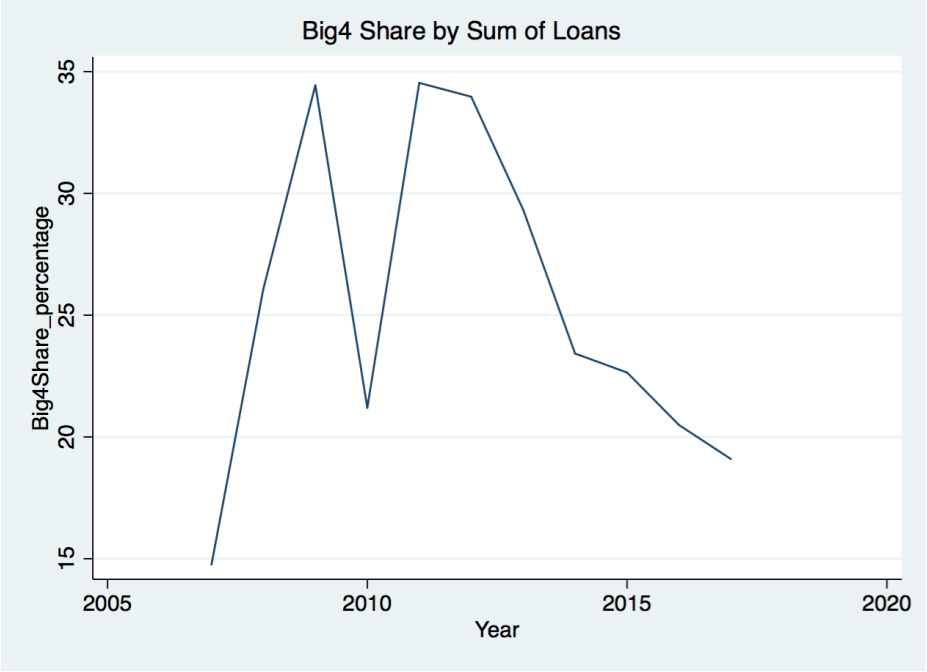

Figure 1: Big 4 Share by Sum of Loan Applied

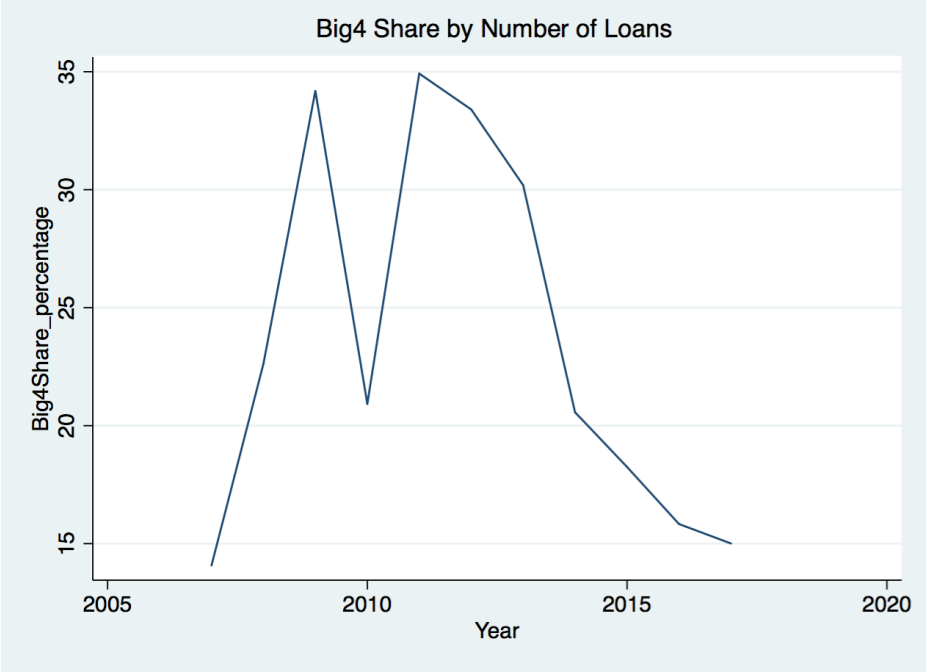

Figure 2: Big 4 Share by Number of Loan Applied

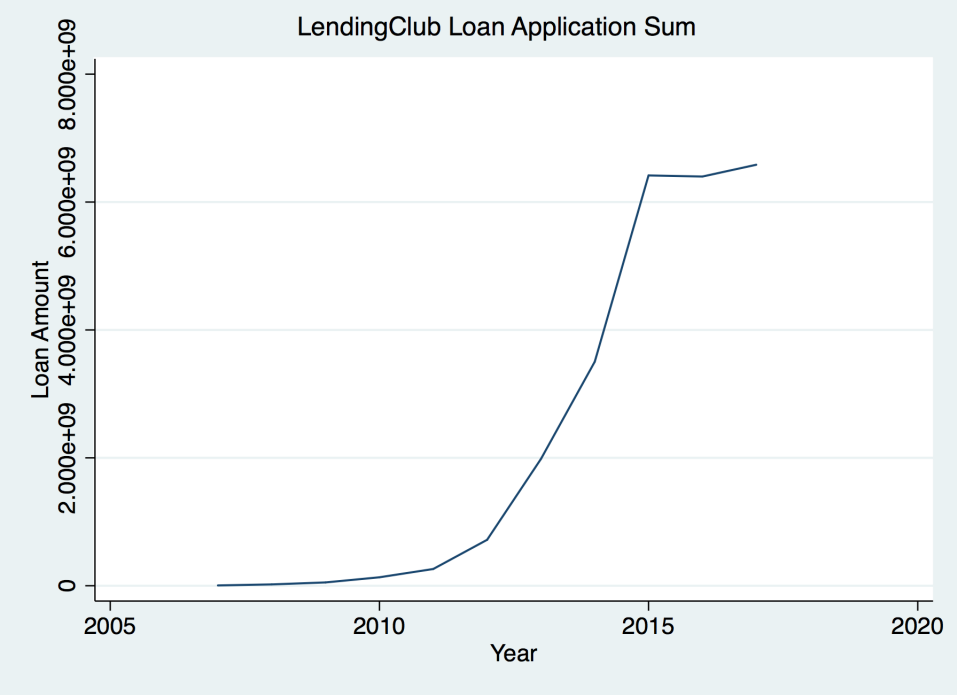

Figure 3: Sum of Loan Applied on Lending Club

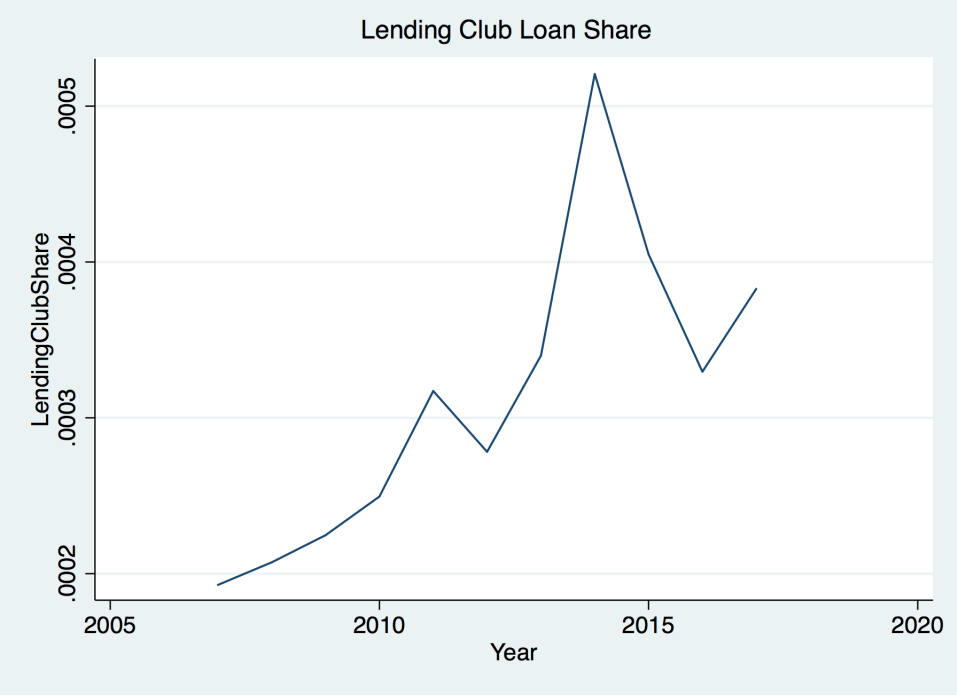

Figure 4: Lending Club Loan Share

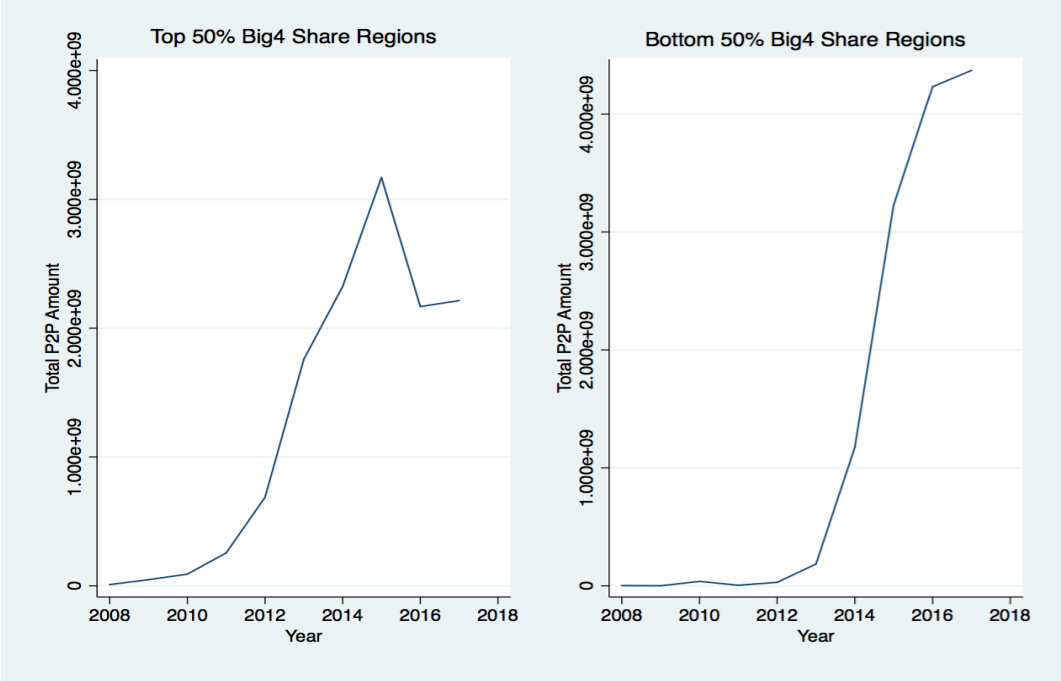

Figure 5: Lending Club Loan Amount Growth Comparison

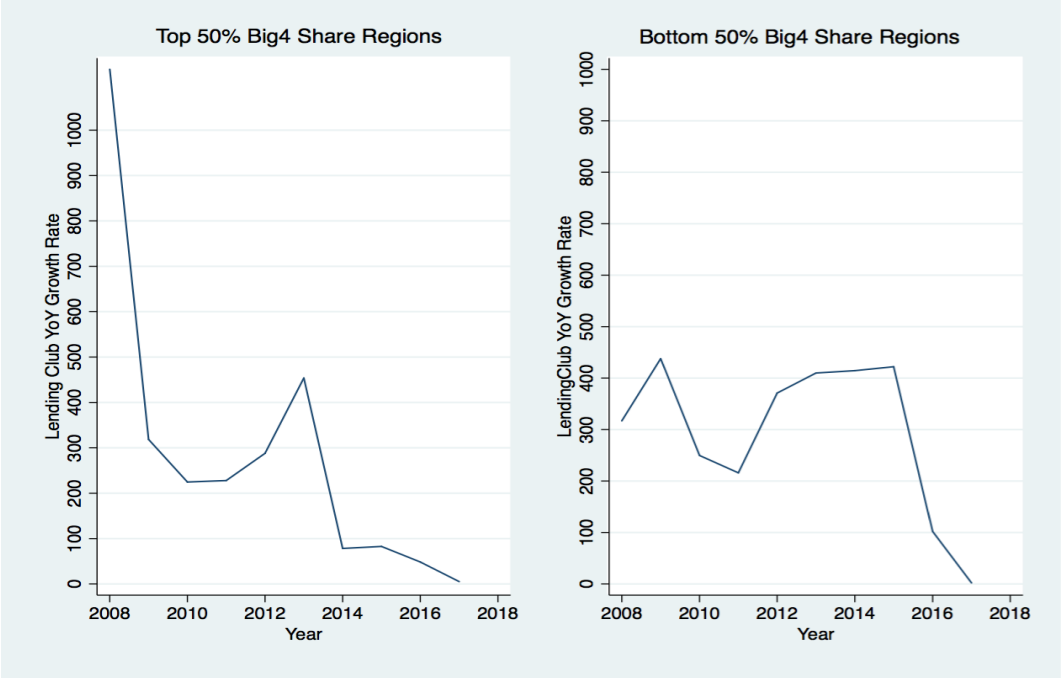

Figure 6: Lending Club Year-Over-Year Growth Comparison

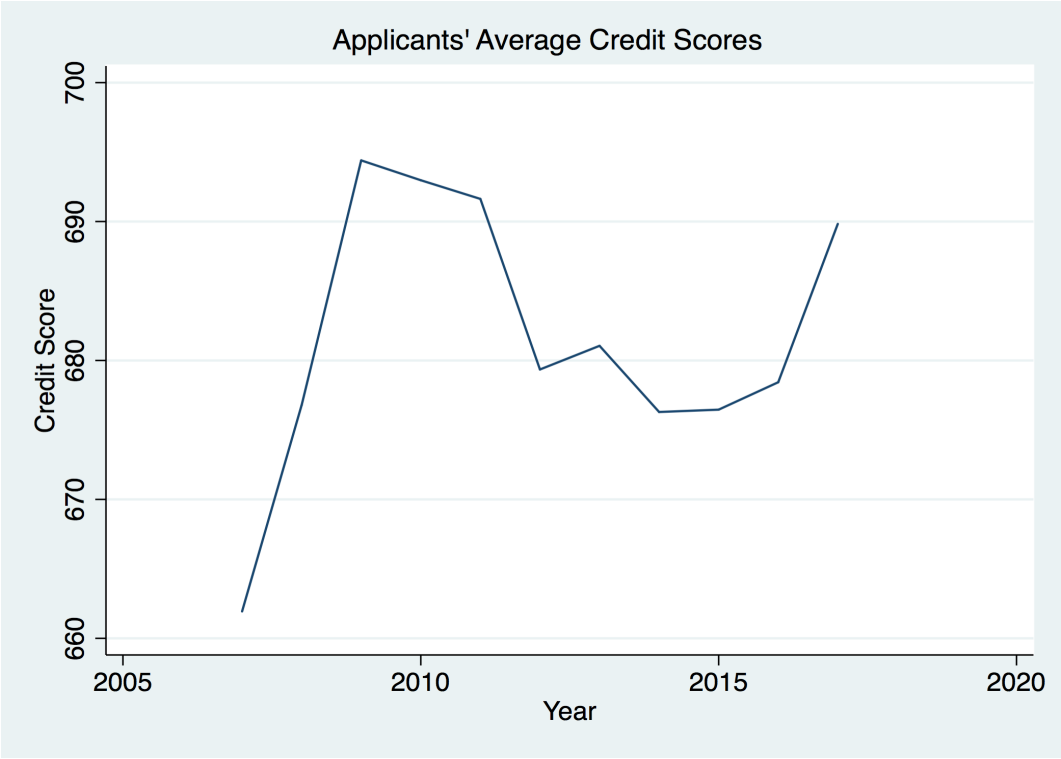

Figure 7: Applicants' Average Credit Score

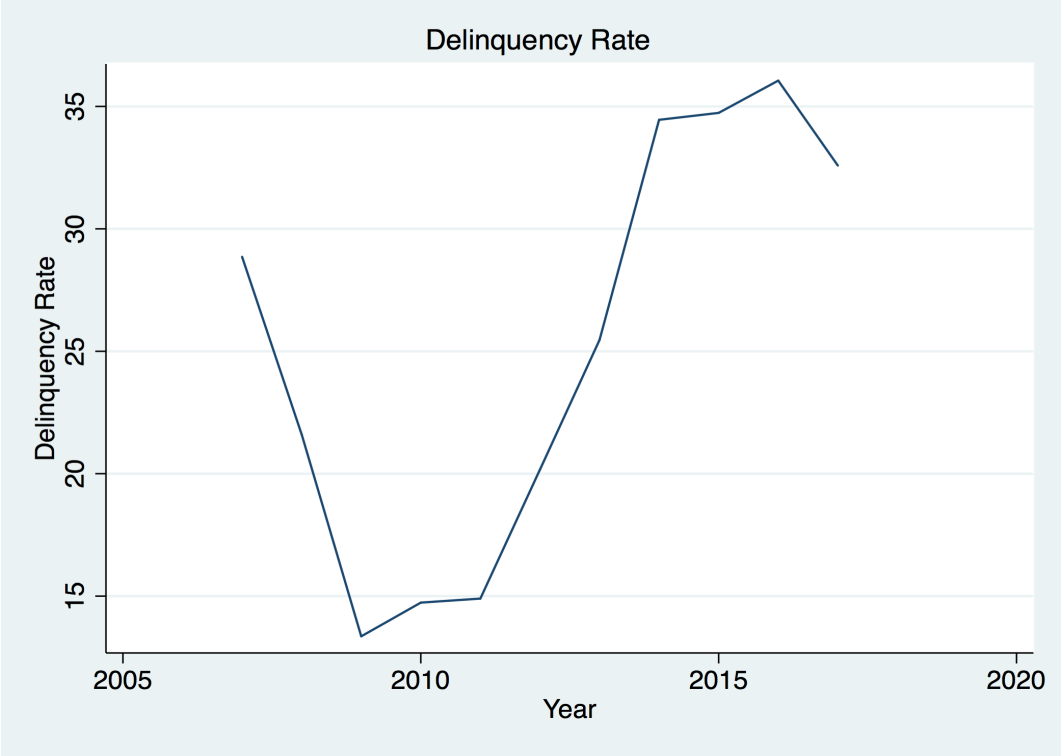

Figure 8: Borrowers' Delinquency Rates

	mean	sd	min	p25	p50	p75	max	N
Annual Income	71587	13134	21600	63622	69433	76116	212075	899
FICO Score	700	5	659	699	700	702	747	899
Loan Amount	2.9×10^7	3.9×10^7	2100	5.8×10^5	1.4×10^7	3.5×10^7	3.1×10^8	899
Funded Amount	2.9×10^7	3.9×10^7	2100	5.8×10^5	1.4×10^7	3.5×10^7	3.1×10^8	899
Delinquency Times	645	865	0	134	317	799	6162	899

Table 1: County-level Lending Club Summary Statistics for Year 2009

	(1)	(2)
VARIABLES	log_LendingClub	log_LendingClub
Big4share	-12.81***	-3.762***
	(0.385)	(0.478)
GDP		3.58e-08***
		(3.35e-09)
unemrate		-0.429***
		(0.0162)
Constant	15.50***	15.65***
	(0.0742)	(0.159)
Observations	7,977	7,925
R-squared	0.135	0.248
Number of ZIP3str	899	891

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Relationship between log value of LendingClubSum and Big4share

	(1)	(2)
VARIABLES	log_LendingClub	log_LendingClub
Big4share_change	-0.0197***	-0.0121***
	(0.000517)	(0.000388)
GDP		6.12e-09***
		(2.22e-09)
unemrate		-0.620***
		(0.00875)
Constant	13.68***	17.81***
	(0.0202)	(0.114)
Observations	6,892	6,850
R-squared	0.195	0.593
Number of ZIP3str	876	869

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Relationship between log value of LendingClubSum and percentage change in Big4share

VARIABLES	(1) log_LendingClub	(2) log_LendingClub
Big4share_changel1	-0.0123***	-0.0106***
	(0.000650)	(0.000408)
GDP_change		-0.0152**
		(0.00639)
unemrate_change		-0.0446***
		(0.00125)
Constant	13.52***	13.84***
	(0.0253)	(0.0190)
Observations	6,891	5,944
R-squared	0.056	0.348
Number of ZIP3str	884	864

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Relationship between log value of LendingClubSum and lagged value of percentage change in Big4share

VARIABLES	(1) D.log_LendingClub	(2) D.log_LendingClub
D.Big4sharel1	1.942***	2.306***
	(0.161)	(0.164)
D.log_GDP		5.479***
		(0.359)
D.unemrate		-0.0385***
		(0.0102)
Observations	6,892	6,850
R-squared	0.021	0.067

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Relationship between the first difference of LendingClub log value and first difference of the lagged value of Big4share

VARIABLES	(1) creditScoreAverage	(2) creditScoreAverage
Big4sharel1	-1.725	-38.49***
	(5.938)	(6.578)
GDP		1.09e-07**
		(5.57e-08)
unemrate		2.882***
		(0.228)
Constant	683.2***	666.2***
	(1.148)	(2.668)
Observations	7,976	7,925
R-squared	0.000	0.023
Number of ZIP3str	899	891

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Relationship between average credit score of borrowers and lagged value of Big4share

VARIABLES	(1) D.creditScoreAverage	(2) D.creditScoreAverage
D.Big4sharel1	-23.42***	-37.77***
	(6.231)	(6.483)
D.GDP		1.16e-07
		(1.47e-07)
D.unemrate		3.131***
		(0.381)
Observations	6,892	6,850
R-squared	0.002	0.012

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Relationship between first difference of average credit score of borrowers and first difference of lagged value of Big4share

VARIABLES	(1) Delinquency_rate	(2) Delinquency_rate
Big4share_changel1	-0.0863***	-0.0675***
	(0.00649)	(0.00476)
GDP_change		-0.00278
		(0.0745)
unemrate_change		-0.223***
		(0.0146)
Constant	26.42***	25.98***
	(0.252)	(0.222)
Observations	6,891	5,944
R-squared	0.029	0.109
Number of ZIP3str	884	864

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Relationship between delinquency rate of borrowers and percentage change of lagged value of Big4share

VARIABLES	(1) log_LendingClub	(2) log_LendingClub
Big4share_changel1	-0.0123***	-0.00727***
	(0.000650)	(0.00166)
GDP_change		-0.00893
		(0.00550)
unemrate_change		-0.0568***
		(0.00141)
regulation		-1.362***
		(0.0371)
Big4_Regulation		-0.000374
		(0.00166)
Constant	13.52***	14.69***
	(0.0253)	(0.0279)
Observations	6,891	5,944
R-squared	0.056	0.518
Number of ZIP3str	884	864

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Relationship between log value of Lending Club loan applications and percentage change of lagged value of Big4share after adding time dummy variable