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A Detailed Look into Peer to Peer Lending

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Online markets work well to bring together new borrowers with new lenders in a more direct manner. In terms of pure economic theory, this elimination of the middle man should create a more efficient marketplace. This peer to peer marketplace is where individual borrowers get direct investment from individual lenders or institutions. The peer to peer marketplace that I am primarily investigating is Lending Club.

Lending Club is the world's largest online peer to peer lending marketplace, where consumers and small business owners can often lower the cost of their credit while avoiding the experience with traditional bank lending. The company was founded in 2007 and has been steadily growing¹ due more publicity about peer to peer lending. Taking advantage of their time to market and providing lower rates, Lending Club has been able to originate about 16 billion dollars' worth of loans². However, this is only a tiny portion of the massive consumer lending market which totals about 3 trillion dollars³. Traditional financial institutions include banks, credit card companies, and credit unions which account for the majority of consumer lending. These institutions typically have nominally different interest rates for borrowing than Lending Club. A slight disparity allows Lending Club to offer their investors attractive rates for risk-adjusted returns because many borrowers have been making the transition due to ease of use online and the rise of the on demand economy. This paper will focus on the aspect of risk and how that sets Lending Club apart while also delving deeper into seeing if peer to peer lending is making for a more efficient financial lending marketplace.

¹ Exhibit 4

² <https://www.lendingclub.com/info/statistics.action>

³ <https://www.lendingclub.com/public/about-us.action>

To make a comparison between the peer to peer giant and traditional institutions, an adequate set of loans from these lenders must be compiled. Lending Club does encompass a wide range of loans: car, credit card, debt consolidation, house, medical, small business, vacation, wedding and many others. Information from traditional lending institutions is very hard to come by since that their whole business could be scrutinized by competition should they become transparent. Lending Club operates like a mutual fund in that it is completely transparent in its operations and loans which can be accessed by the public. Once your free membership begins, access to all loans originated in the past three years are available for download and analysis. According to Lending Club, its financial model takes into account credit risk and market conditions and then adds its base rate plus an adjustment for risk and volatility. Based on that rate, they then grade each loan from A1 to G5 with higher risk-adjusted returns for each loan grade increment where A1 is the least risky and has an interest rate of 6.03% and G5 is the most risky with an interest rate of 26.06%. All loans are either 36 or 60 months with fixed interest rates and equal monthly payments and no prepayment penalty. Lending Club grades the borrower based on credit score and “a combination of several indicators of credit risk from the credit report and loan application”⁴. The credit report gives each borrower a FICO score which can then be used for comparing risk in lending and default risk between Lending Club and other financial institutions.

Lending Club covers a wide array of loans but in this analysis we will be focusing on car loans and more specifically an Asset Backed Security (ABS) of car loans. Asset Backed Securities have been growing in prominence from the 1990s till now⁵. These securities operate

⁴ <https://www.lendingclub.com/foliofn/rateDetail.action>

⁵ Exhibit 3

by pooling loans which could be auto, credit, mortgage or otherwise and then sell them to a secondary market in the form of a security. Securities have tiers based on seniority with the highest tranche getting the lowest return for the most secure position. Ally Bank has many different asset backed securities but the most comparable prospectus to Lending Club's car loans was the Ally Auto Receivables Trust 2012-4⁶. The offering for the receivables trust is \$1,274,430,000 Asset Backed Notes which are all rated class A-1 to class A-4 which signifies some high quality borrowers with the majority of the shares in A-1 and A-2 categories. The initial distribution of these funds was September 17, 2012 which makes for a nice comparison with the Lending Club data⁷ that ranges from 2012 to 2013 allowing for direct rate comparisons. For A-1 the interest payment, a Lending Club borrower pays for the 3 year loan is 6.03% while A-4 Lending Club borrowers incur an interest rate of 7.90%. On the other hand, Ally's interest rates are averaged to about 3.621% for class A-1 and 9.6% for class A-4. Admittedly, they have different rating scales as Lending Club does its own rating system with help of FICO score while securities like the Ally Receivables Trust must be rated by a rating agency, here Moody's rated the security as Aaa⁸, the safest most secure rating.

Clearly, there is a difference in interest rates for an A-1 rated loan of Ally and an A-1 rated loan from Lending Club. Being that this is risk-return based, does one category have more risk than the other? At first glance, we will look into the differences in FICO scores of the underlying borrowers as a determinant of risk and return. The higher the FICO score average the less risk is likely involved in the investment. Ally Auto Receivables trust has 304 million dollars

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<http://www.sec.gov/Archives/edgar/data/1477336/000119312512347911/d392299d424b5.htm#srom392299> 19

⁷ <https://www.lendingclub.com/info/download-data.action>

⁸ <http://www.autofinancenews.net/ally-adds-1-billion-to-securitization-pipeline/>

in A-1 asset backed notes which is about one fourth of the total trust. One reason for the lower interest rate for the A-1 rated backed notes is that the trust works as a tranche in that first, the A-1 notes are paid in full and then the A-2 rated until they are all paid off or A-4 might not recoup all of the money they had a possibility of earning. There is a much higher risk of default for those investing in the A-4 portion of the Ally investment trust because if more and more loans default over the time span of the investment, their whole position could be wiped out since it has the lowest seniority. Lending Club does not work like a security in that the investor can take a look at each loan being offered and then invest in those that fit their investing profile. There is no seniority though there is prepayment risk like that in the security which can affect returns. Finally, Ally bank has low returns for A-1 since they are hedged against prepayment risk which costs them a few basis points from what they should expect in the same investment from Lending Club. What the investor of an A-1 tranche is investing in is security where some of these only pay out 30 to 50 basis points above the LIBOR rate.

Taking a harder look at FICO scores will allow a more precise measurement of risk between the two sources. The average FICO score of the borrowers included in the Ally Auto Receivables Trust is 751.78 while the average FICO score of A1-A4 auto loans in the Lending Club pool is 758.09. These numbers are quite close and in reality the borrowers have been vetted by the rating agency and signify good borrowers who are on the edge of being “excellent” borrowers⁹. What goes into FICO scores? A popular FICO score chart describes the main factors that affect score are 35% payment history, 30% debt owed, 15% age of credit history, 10% new credit, and 10% types of credit¹⁰. FICO scores have a range from 300 to 850 which shows that

⁹ <https://www.credit.com/credit-scores/what-is-a-good-credit-score/>

¹⁰ <https://www.credit.com/credit-scores/what-does-fico-stand-for-and-what-is-a-fico-credit-score/>

the car loan borrowers are mostly high quality and low risk of default. The most recent versions of FICO have been proven to be validated against economic cycle risk¹¹. All told, this is a robust measure of riskiness that has been vetted by the financial industry for decades and is a continued common practice used in credit scoring.

Now, let's take a harder look at these differences in FICO. First, the difference is 7 which is nominal because the score can have some variance depending on when it is checked but double digit difference could be statistically significant. In a 95% confidence interval, the difference of 7 points is covered which implies they aren't distant enough to be significant. If there is no difference, then why the differences in annual percentage rates of interest? Comparing A-1 the safest assets of each firm, there is about a 3.4% gap between the rates which is close to double that of Ally's A-1 annual percentage rate. However, the opposite is found when looking at the A-4 assets which have 1.7% spread in favor of Ally. When initially starting this research, I expected to find that Ally would have a lower rate of return across the board which is not always the case, instead, they generally have a lower return because of the weight in the portfolio. However, I forgot to take in the possibility of a tranche which could distort risk-adjusted returns. Looking at the Ally Auto Receivables Trust as a whole proves to be more insightful in this case since Lending Club doesn't have a tranche system nor offer one. The weighted average annual percentage rate of all receivables in the pool is 3.07%. How is this possible? The average is not always the best measure of rating and since the groupings rated A-1 by Ally are grouped by Ally, they could have a majority of safer assets while still keeping in some of the less safe assets with higher risk of default to raise the APR to 3%. Holistically, the annual percentage rate for Ally's when broken down by 1% increments are 37.24% in the 0-1% interest range, 4.47% in the 1-2%

¹¹ <http://www.fico.com/en/blogs/risk-compliance/fico-score-work-good-times-bad/>

range, 10.17% of loans in the 2-3% range, and 13.55% in the 3-4% range which accounts for over 50% of the total loan amounts with just one loan in the 17-18% range. These statistics show that over a third of the loans in the Ally pool are between zero and one percent interest which implies incredibly safe assets while there are few loans outside of 5%. Lending Club does it differently where each A-1 loan is locked in at 6.03% for the lifetime of the loan. This implies that on average there is at least a 3% spread between what Ally Auto Trust offers and what Lending Club also offers to its borrowers. A 3% spread is not enough to encompass the risk of default in Lending Club. For an A-1 Lending Club note, the risk of default in our sample is 2.58%¹². There still exists a spread between the two without even accounting for the losses of the institution as well as the average age of default of the loan. Lending Club loans, no matter which grade of note, tend to default around the 18 month mark¹³ or about halfway through their 36 month lifecycle. Thus, the whole 2.58% is not lost in default because the default typically doesn't happen until halfway which cuts down the percentage loss for investors. Finally, when comparing the weighted averages of the pools, Lending Club has a weighted average of 7.33% on 3 year auto loans while Ally has 3.07% on their pool. Clearly, there is a difference in risk-adjusted returns in favor of Lending Club. Even though the quality of lenders is quite similar as evinced by the similar FICO range, Lending Club has a premium on their interest rates which make them higher than those in the Ally pool which in turn gives higher returns to investors.

Moody's, the bond credit rating business of Moody's Corporation, has rated each tranche of the Ally Auto Receivables Trust 2015¹⁴. The rating for A-1 is Aaa which holds true till class

¹² Exhibit 7

¹³ Exhibit 6

¹⁴ https://www.moodys.com/research/Moodys-assigns-provisional-ratings-to-Ally-Auto-Receivables-Trust-2015--PR_328200

A-4 notes. The B notes of Ally are rated Aa while C notes are rated A and finally the class D notes are rated Baa, just above investment grade. Since Moody's is world renowned for its rating system, it might be best to compare Ally Auto Receivables Trust sectors according not to their A-1 class notes against A-1 Lending Club notes but rather A-1 to A-4 Aaa notes to Lending Club's A-1 rated notes and so on. When doing this comparison, we get a weighted average of 6.108% for the A-1 to A-4 Aaa rated notes which compares against 6.03% of Lending Club. If you replace A-4 to try to exclude some of the tranche bias that comes from the risk of default, the weighted average becomes 5.64%. This comparison makes for a clearer picture that there is a disparity between Ally and Lending Club. Moreover, Lending Club is able to provide higher returns which might be better attributed to the fact that Aaa ratings are often seen as nearly as safe an asset as the United States Treasury Bill. Perhaps the pool allows for increased security while an A-1 Lending Club loan bears more risk in that it loses all value should its borrower default. On the other hand, Lending Club allows for a minimum investment of \$25 in each note which if distributed across all the A-1 notes could form a pool which would spread risk and give higher risk adjusted returns. A direct comparison with Lending Club becomes increasingly difficult because of the tranche layout of the Ally Auto Receivables Trust which adds a layer of complexity.

Looking at just a one to one comparison isn't enough to prove something is concrete nor applicable across the board. Next, we will compare Lending Club with Santander Drive Auto Receivables Trust 2011¹⁵. Santander is another pool of auto assets but what makes this different from the previous case of Ally is that the loans pooled into Santander have a higher range and

¹⁵ <http://www.sec.gov/Archives/edgar/data/1383094/000119312511213925/d424b3.htm>

would not all be categorized from A-1 to A-4 but rather are from A-1 to E class. This wider range of assets allows for a good comparison with Lending Club because the car loans in Lending Club also have a range from A to E. Taking an initial glance at Santander, we find that the highest FICO score in the pool is 850 (highest possible FICO score) and the lowest FICO score is 362 which signifies terrible credit. However, the average is set at 585 for the pool in comparison to Lending Club's 713 average which implies that the Santander security is significantly more risky on average than Lending Club's offering of auto loans. Inspecting the range of interest rates gives Santander a range from 0% to 29% compared to Lending Club's 6.00% to 25.83%, with the weighted averages at 16.89% and 12.19% respectively. At first glance, this seems to make sense because the higher the risk the higher annual percentage rates you would expect. However, the Santander Auto trust is also formed like a tranche in that the first payments are given out to those like the servicer and then to Class A noteholders until finally the fifteenth tranche is given to the residual interest holder who makes 29% interest¹⁶. The wider range of interest rates makes more sense in this situation due to the servicer not requiring any level of interest return while the fifteenth person in line expects a very high rate of return since they bear the most default risk.

When looking at the range we see a sharp difference between the A-1 loans which have a 5% gap in favor of Lending Club which then gets closed as the loan quality diminishes. Furthermore, the first few tranches are the safest for Santander while similar holds true for Lending Club. However, for Santander "interest accrues on the notes at the following per annum coupon rates: Class A-1 notes, 0.29% [...], Class E notes, 5.88%." The implication here is that the interest rates can vary extremely within the class of notes but the return is set for each

¹⁶ Exhibit2

tranche. The highest level of return is class E at 5.88% which pales in comparison to the returns off Lending Club which has class “A” returns of 7.26% on average¹⁷. Even if you get into the risk of investing in Lending Club, the charge off rates for a class A note on the site is 5.91%¹⁸. Thus, your loss rates are still quite low and Lending Club will be proven to be the better risk-adjusted returns. This disparity shines light on a gap in risk-adjusted return between the securitization and peer to peer lending. Another reason for this gap is that the lowest FICO score in Lending Club is 660 and goes up to 850 as well. Thus, a smaller range in FICO scores especially where 660 is a fine credit score signifies less risk in investing in the platform of Lending Club. However, the difference in returns draws attention to a disparity in pricing which can affect returns. Because of this difference, there is an arbitrage opportunity for financiers to make a higher profit by investing in peer to peer lending which has turned out to be the case as it is “a lot harder to find good notes recently as they get funded within a few minutes by big investors”¹⁹. Thus, this apparent phenomenon is being noticed by the larger financial players who have taken their interest in seeking out higher returns which means the gap could be closing in the near future.

Finally, we will change directions away from auto loans and compare Lending Club against the SLM Student Loan Trust 2012-3²⁰ where student debt and debt consolidation is another subsector within Lending Club. The weighted average coupon for the Student Loan Trust varies between years ranging from a low of 2.60% which seems to be an outlier to a high of 7.21%, a more accurate representation. In 2012, the weighted average coupon for the trust was

¹⁷ <https://www.lendingclub.com/public/steady-returns.action>

¹⁸ Exhibit 7

¹⁹ <http://www.crowdcru.com/review-of-lending-club-for-investors/>

²⁰ <https://www.navient.com/assets/about/investors/debtasset/SLM-Loan-Trusts/Static-Pool/2012-3/FFELPRegAB03262012.pdf>

6.66%. This student trust was created in 2006 and the number of loans and underlying assets have constantly been changing making it more like an open end fund rather than security, as long as the underlying risk profile stays constant. On average, the number of loans on the balance sheet tends to be about 400,000. When comparing this to Lending Club, a direct apples to apples comparison is hard to find due to the lack of rating within the student trust. However, when digging into the number of loans stratified by the borrower interest rate, you begin to see that the majority of student loans have a rate between 6.51% and 7% with a low of below 3% and a high above 8% interest. Lending Club offers rates of over 7% for just A rated loans. This stands in stark contrast to the SLM Student Loan Trust that offers the same rate for the thousands of loans they have in their portfolio that are loaned to students without jobs and that lack ways to pay back immediately.

Lending Club's transparent use of data allows users to find their own winning strategies. An example of this might be that perhaps investors prefer investing in California based loans for teachers who have had their jobs for at least 5 years. By filtering loans to a very specific subsection of the entire market, investors can create a strategy that allows them to have a higher mean and ideally a lower variance portfolio of loans. There is much discussion online about what an optimal strategy might be according to the numerous filters that Lending Club allows you to apply on their loans. After looking into the rates of returns of various subgrades as well as FICO score and location analysis, I was able to come up with a strategy that should minimize loss. First, I took a look at the FICO scores for the loans that were at default or final payment. The graph of which looks like an x with the higher FICO scores having higher rates of fully paid while the lower FICO scores have higher rates of "Charged Off"²¹. The FICO score at which

²¹ Exhibit 1

they cross is about 570-580 which would be categorized as “Bad Credit” according to Credit.com²². Investing in a loan where the borrower has below a 570 FICO score typically means that they are 50 percent or more likely to default and will likely be rated in the E through G category on Lending Club which offers a 20-29% interest rate²³, the riskier the borrower the higher rate to encompass risk adjustment. Furthermore, when inspecting the graph, an inflection point occurs around the FICO score of 650 where about 93% of loans are “Fully Paid”. Going up 10 FICO points makes 660 and above seem like a great criterion for safer lending with good payoff. Next, I looked at starting FICO which gave a slightly different charge off rate but still a quite healthy return and then added in a 3 years of credit history or more into the analysis which didn’t show much change. Also, when adding in 660 FICO or above, with 3 years of credit history, and no delinquencies in the past 12 months, there was no visible improvement which could be due to the confounding factors that a delinquency in the past might drop the borrower below the 660 FICO mark. Finally, I checked if the location of the borrower of the loan mattered. To my surprise, Montana and Arkansas are the only states that seem to have a disproportionately high level of default when compared to the rest of the United States²⁴. Thus, when looking for investment try to avoid these two states as they default more often which might be related to their unemployment rate. Everywhere else seemed to have a more normalized level of default. Overall, there was much to learn from the cross analysis of the quarter million past loans from Lending Club which could help out future investors who are risk-averse and seeking higher profits.

²² <https://www.credit.com/credit-scores/what-is-a-good-credit-score/>

²³ <https://www.lendingclub.com/foiofn/rateDetail.action>

²⁴ Exhibit 5

With the comparisons out of the way, it is time to dive into the institutional differences between the online lending giant and traditional car loan financiers. First, peer to peer lending has been gaining a lot of traction in the past couple of years and has not gone unnoticed by financial giants such as Wells Fargo because peer to peer cuts out traditional banks by matching capital directly with the borrowers. Wells Fargo even went so far as to ban their staff from using peer to peer lending sites like Lending Club because “peer-to-peer lending is a competitive activity that poses a conflict of interest”²⁵. The LendingMemo.com article goes on to claim that the differences in rates can be attributed to how lean and efficient Lending Club is with the only infrastructure being a server farm in Nevada and an office in downtown San Francisco. Furthermore, author Simon Cunningham delves deeper into comparing the Operating Expense Ratios of Wells Fargo and Lending Club by looking primarily at Wells Fargo’s Community Banking feature which is similar to that of localized lending and arrived at a ratio of 5.63% operating expenses for Wells Fargo and 2.08% for Lending Club. This implies that Lending Club is over twice as efficient as traditional banking per dollar lent out which could be a key to the institutional difference. As the years go on, Lending Club, in true “fintech” (financial technology) fashion, is getting even more efficient as their volume increases and costs stay constant. Looking at a different aspect of the gap, Mark Calvey wrote in the San Francisco Business Times that “lending platforms can offer loans at lower rates than banks charge” because of the “powerful advantages by not having to keep loans and deposits on their balance sheets, and all the banking regulation that comes with traditional banking”²⁶. Banking regulation is a

²⁵ <http://www.lendingmemo.com/wells-fargo-peer-to-peer-lending/>

²⁶ <http://www.bizjournals.com/sanfrancisco/blog/2014/01/wells-fargo-bank-lending-club-prosper.html?page=all>

loss in opportunity cost that prevents the bank from participating in profitable activities²⁷. There is also an ongoing cost associated with compliance with regulation that takes the labor costs of banking officers on new or updated regulation take up a large portion of these costs²⁸. Finally, there is an economy of scale when it comes to regulation because some can be quite costly to comply with. This implies that smaller banks are at a cost disadvantage that then promotes consolidation instead of competition. Lending Club has a frequently asked question about how it offers rates and replied by saying Lending Club “bypasses many of the costs and the complexity of a traditional bank loan. These savings are passed through in the form of lower rates [because] Lending Club does not have the high administrative, marketing, and infrastructure costs”²⁹. This is a very valid point; as Lending Club gains more and more borrowers and lenders, its cost per loan decreases which might allow it to give even better pass through rates. Though these costs add up, it is hard to judge the gap in the loan rates solely on an operational cost level. The gap is shown in the Lending Club rates for grade A loans when compared with traditional financing which has average rates of financing around 5-7% on new cars³⁰. This gap is more than just operational costs but it does have a slight effect on return.

Though there are many institutional differences between peer to peer lending online and traditional banking, many of the risks still befall both. Risk of borrower default is inherent in both types of lending. Prosper, another peer to peer online lending marketplace, mentions that “investors should be aware that the [loans] offered through our marketplace are risky and speculative investments [and] if a borrower fails to make any payments, [received] payment will

²⁷ <http://www.federalreserve.gov/pubs/staffstudies/171/ss171.pdf>

²⁸ <https://ideas.repec.org/p/fip/fedgss/171.html>

²⁹ <https://help.lendingclub.com/hc/en-us/articles/214584697>

³⁰ <https://research.stlouisfed.org/fred2/series/TERMAFCNCNSA>

be correspondingly reduced”³¹. Banks incur the same risk reward payoff matrix that those investing in peer to peer lending do only that because of their size they are able to smooth over the risks with having a diversified portfolio of hundreds of thousands of loans which is seemingly impossible for a peer to peer lender. However, some of this loss of diversification can be made up by peer to peer lenders by only investing the minimum amount of \$25 in each loan and then stratify it according to their desired rate of return. Another risk that affects both marketplaces is the increase of loss rates that occur as a result of economic conditions beyond control of the investor and borrower. General economic conditions such as recessions and depressions can greatly affect how likely a borrower will be able to repay. Loans are affected by factors such as prevailing interest rates, the rate of unemployment, the level of consumer confidence, the value of the United States dollar, the residential housing market, and disruptions in the credit market among other things. These risks are inherent in the market and can drastically change the lenders rate of return.

Despite the multitude of similarities in risks, there are still a few risks that are independent between institutional investing and peer to peer lending. First, peer to peer investors are more easily capable of diversifying their risk. With a minimum of \$25 investment in a note, investors can spread their default risk wider than an institutional investor who has thousands locked into one loan. Another risk inherent in peer to peer lending platforms is was well stated by a Lending Club user that said, “.Lending Club payments will be the first debt payment that people decided not to pay if they lose their jobs.” This paints the peer to peer lending community as a tranche-like system with Lending Club and Prosper at the lowest tranche with the most risk of user default and institutional lending above. The reason for borrowers to default

³¹ https://www.prosper.com/Downloads/Legal/Prosper_Prospectus_2016-02-15.pdf page 17

on peer lending first is that people are less likely to feel obligated to pay back a loan to an online creditor than that of an institutional bank. Another risk in peer to peer online lending is that the lack of government regulation may actually hurt their business. For example, if the economy is in a major downturn and the default rate becomes too high then these institutions may go under and not qualify as a traditional bank would for a government bailout. However, Wells Fargo and other larger banks qualify for Federal Deposit Insurance Corporation³² backing up to \$250,000 but this is not applicable in securities and peer to peer lending.

When comparing the two peer to peer online lending giants Prosper and Lending Club, their statistics are often quite similar. Prosper tends to have about half as much volume as Lending Club yet still has similar return on investment³³. These similar returns are typically have a 1% span in favor of Lending Club the past two years³⁴. However, Prosper started out with a return over 10% while Lending Club's initial few years had low and even negative returns. It is fascinating that their role in the market is nearly identical with both of the services offering investment in peer to peer lending with a minimum of \$25 investment and yet there seems to be a stratification between the borrowers on the two sites to some degree. Looking at the APR of their loans we find that Lending Club has a lower APR of 12.94% while Prosper has an APR of 13.50%. Where they differ is in the percentage loss. Here Lending Club has 4.48% for 2015 while Prosper has 5.24% which is enough to give Lending Club a higher return on investment for the year. The stratification between returns of the two sites can also be attributed to the fact that Prosper takes on less financially stable investors. Thus, they take on a higher risk for a higher reward in peer to peer lending. However, if too many of these high risk borrowers default, their

³² <https://www.fdic.gov/consumers/banking/facts/>

³³ <https://www.nsrplatform.com/app/#!/>

³⁴ Exhibit 9

average return falters. All told there are some differences between the two lenders but they pale in comparison to that of the traditional banking establishment.

The prospectus of Prosper, a peer to peer lender in the market, details the risks that lenders take on when using their site for investment purposes³⁵. A few of these risks stick out quite a bit and could be significant reasons as to why there is a gap between return on investment between banks and peer to peer lending sites. First, Prosper says that “information supplied by applicants may be inaccurate or intentionally false. Information regarding income and employment is not verified in many cases”. This is a glaring red flag due to the immense hidden risk that some investors might not realize when beginning to invest in their loan offerings. Applicants supply a lot of personal data to qualify for a loan which could be intentionally falsified to seem like a more credible borrower than they actually are. This falsification would directly affect their return on investment and the likelihood that the borrower is able to fully repay the loan. The higher FICO score and income an applicant has, the more likely it is for them to qualify for better interest rates on their loan, creating a disincentive to provide the truth. In 2015, Prosper was able to verify about 59% of the employment and/or income of those they let borrow which is below the threshold of Lending Club. Another interesting risk detailed in the prospectus of Prosper is since this marketplace is a relatively new lending method and has limited operating history, “borrowers may not view or treat their obligations as having the same significance as loans from traditional lending sources”. This is something that might not be considered by many investors since the peer to peer borrower gets the same exact cash as if it were a traditional bank but might not treat it the same. The reason for the different treatment could be due to the fact that all of the work is done online and they might not feel the same

³⁵ https://www.prosper.com/Downloads/Legal/Prosper_Prospectus_2016-02-15.pdf

obligation as having sat down in a banking institution and signed the contractual obligation in front of someone. Borrowers still receive the same reminders as they would traditionally but might not weigh it with the same significance. Finally, the biggest most glaring risk is that peer to peer lending “marketplace may fail to comply with applicable law, which could limit [Prosper’s] ability to collect on borrower loans”. Should the peer to peer online marketplace be proved to be illegal, the entire system fails and falls apart which entails nobody getting their money before the collapse. However, what Lending Club and Prosper have going for them is that they have been around for 8 years doing this type of lending without being shut down for gross violations of lending laws. They have survived numerous lawsuits and litigation yet remain in their niche market making a spot for themselves. All told, it seems as though peer to peer lending is here to stay and on the rise in popularity.

Does Lending Club and other peer to peer lenders create a more efficient marketplace? Market efficiency is defined as “one where the market price is an unbiased estimate of the true value of the investment”³⁶. Using this definition, we can start to analyze the effect of Lending Club on the loans market. Furthermore, a key concept of an efficient marketplace is that there is no group of investors that should be able to consistently find under or overvalued stocks using any type of investment strategy. Peer to peer lending tends to have lower rates and better returns than traditional financing which shows that the market is not efficient. However, an ideal market would have lots of buyers and lots of sellers in this case borrowers and financiers. Since auto loans typically happen from a handful of lenders, this push towards more competition through peer to peer lending is in favor of a more efficient equilibrium. Ideally, the market supply equals

³⁶ http://pages.stern.nyu.edu/~adamodar/New_Home_Page/invemgmt/effdefn.htm

the market demand so that the markets clear and that each agent participating maximizes their given utility function³⁷. Walrasian equilibrium here is not met because of the shortage of buyers willing to take the risk to loan out their money. Peer to peer lending adds many more lenders into the equation that see it as an investment opportunity that they are willing to take on the risk of a lender defaulting. Pareto efficiency is defined as being at an optimal location such that should any agent move, they would be making someone worse off. Reality is much further off from this Pareto efficient point but more and more borrowers are shifting towards peer to peer lending due to the better returns on investment. It seems as though this market is not efficient since there seems to be a mispricing in the risk-adjusted returns. Lending Club outperforms these other securities even when accounting for risk which shows there is room for optimization in the industry by adding more players. Furthermore, the rapid rise in its popularity is a testament to our lending economy getting closer to this optimality through direct lending.

Lending Club and peer to peer lending have been a growing industry over the past 8 years. The online lending platform is able to coax high quality borrowers in with its advertisements for loans starting at 4.99%³⁸. This low percentage rate could be seen as a teaser rate to get better borrowers or just more interest in using the site for lending. Let's dive into the likelihood of getting this A-1 rating for your new loan. First, only one third of all Lending Club borrowers are able to get a rate below 12%. By the law of complements, two thirds of borrowers have a rate between 12% and 29% which sounds a bit high but can actually be much lower than a typical 20 something percent on credit card debt and isn't all that terrible considering that they make loans out to those at a credit score of 660 and above. Next, the average rate for a 36 month

³⁷ <https://web.stanford.edu/~jdlevin/Econ%20202/General%20Equilibrium.pdf>

³⁸ <http://www.magnifymoney.com/blog/personal-loans/will-lending-club-approve-a-low-rate473448154>

loan is 12.7% while a 60 month loan is 17.2% which is a significant 4.5% difference. This gap applies for those with a nearly perfect credit score of 750 and above: 8.2% for 36 months and 13.2% for 60 months. Even with a great credit score your average rate is at least 8% which is what attracts so many investors. Furthermore, to get this coveted A rated loan with the lowest interest, you should be using less than 43% of your credit line, have a credit score rating above 700, ask for less than \$14,000, have no late payments in the past 2 years, and have more than \$85,000 in annual income. Now, given that you have all of these things going for you, you aren't even guaranteed to get their lowest rate just in the running for it as other minor factors might exclude you. Of the 1516 car loans made on Lending Club in 2014, only 54 or 3.56% of all car loans were A-1 graded which, at the time, ran the rate of 6.03%. All told, it is quite difficult to get their best rates as 65% of Lending Club loans go to borrowers with a 700 FICO score or below.

Financial markets are an imperfect marketplace for a few reasons. The first of these reasons is that, as mentioned previously, the market is not Pareto efficient nor in a Walrasian equilibrium. There needs to be more players in the game for it to become more efficient. A larger issue at hand creating an imperfect market is the lack of transparency. Lending Club has all of its past loans in downloadable Excel files for all to search and find their own winning algorithm. However, this does not hold true for the larger lending institutions making out these loans. Typically, only the B piece buyer is in charge of going through all the loans in the pool and vetting them though the information is not shared widely. Connecting this to the modern day, our economy is increasingly becoming an "on-demand economy" with anything available from groceries to a 60 inch television with a simple click of a button. Americans are becoming more and more comfortable with this reality of not having to shop store to store to find what they want

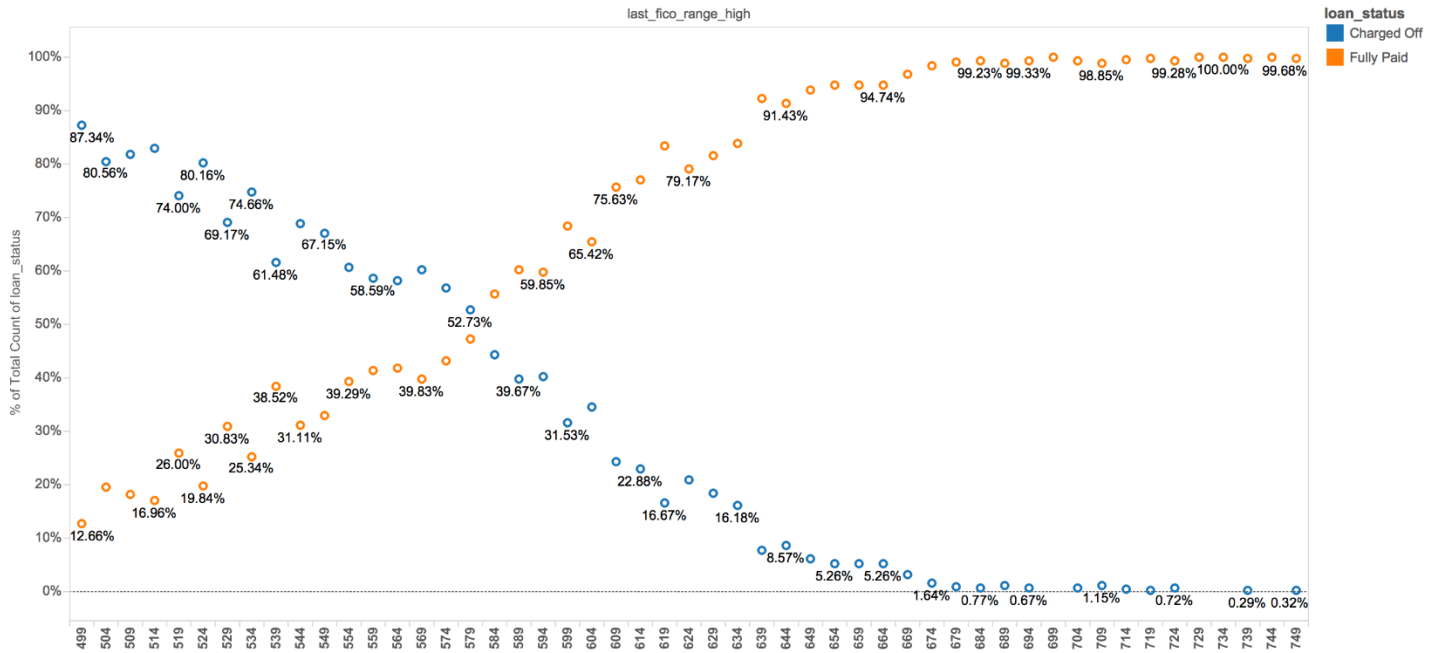
but rather go online to large retailers like Amazon. The on-demand economy is what created online peer to peer lending giants like Lending Club and Prosper. Online markets and their increased usage are the key to their success. Borrowers do not have to walk into a banking establishment to get a loan anymore but rather can log in, enter some details about their financial history and within 48 hours of approval, have the cash on hand. Going back to the difficulty of landing the best rate with Lending Club, the qualifications for one to obtain it are quite difficult but if you should qualify for their ideal 4.99% lending rate, it is highly likely you could qualify for a lower rate elsewhere. With an excellent credit score, high income, and low credit utilization, a borrower could get a rate of 3% or below from a local credit union and even some banks which could save a thousand dollars or more over the life of the loan. Thus, this on-demand economy might be great at bringing goods to you in a more convenient fashion but shoppers need to be wary to see if they are getting the best rate on the market.

In conclusion, peer to peer lending is on the rise for good reason. Lenders and borrowers are brought together in a more efficient marketplace with only a 1% loss to the servicer for origination and servicing fees. Lending Club and Prosper offer better rates than the likes of other securities like auto and student loan backed securities. Ally Auto Receivables Auto Trust and Santander Auto Receivables Trust were two prime examples of the auto asset backed securities that operate in tranches. The lowest and most secure tranche has the lowest rate and in the case of Ally, even the riskiest tranche had a lower rate than the average for the A level rated loans of Lending Club. When comparing with Ally, Lending Club has higher interest and pass through rates than the A rated categories which allows it to give its investors better risk adjusted returns. Santander Auto Receivables Trust had a wider range of auto loans in its pool and thus had a more variable return and a lower average of FICO scores than Lending Club would even serve.

The return can be up to 29% for the lowest tranche of Santander but a few loan defaults can wipe out that position making it a highly risky lending position with a lower expected return. Investors would be better off investing in a loan with a higher FICO score on Lending Club and risk a 25% return which has a higher probability of return given the lack of a tranche system in Lending Club. Peer to peer lending offers higher rates to qualified lenders than if they shopped elsewhere which allows for investors to earn higher returns on investment. Since this phenomenon has been occurring for some time, the market should see more big investors which has been the case as the best loans are fully invested within minutes by a single large institutional investor. As more and more start using it as a platform I expect the returns to diminish and expect borrowers to have more and more online options when looking for a loan. At the same time, the peer to peer lenders like Prosper and Lending Club were created after the financial crisis which leaves them unchecked by recession. All told, Lending Club currently offers better risk adjusted returns than traditional financing which is what has allowed it to continue growing and gaining momentum as a viable investment platform.

Exhibit 1: Charge off Data from Lending Club

Charge Off Data LendingClub



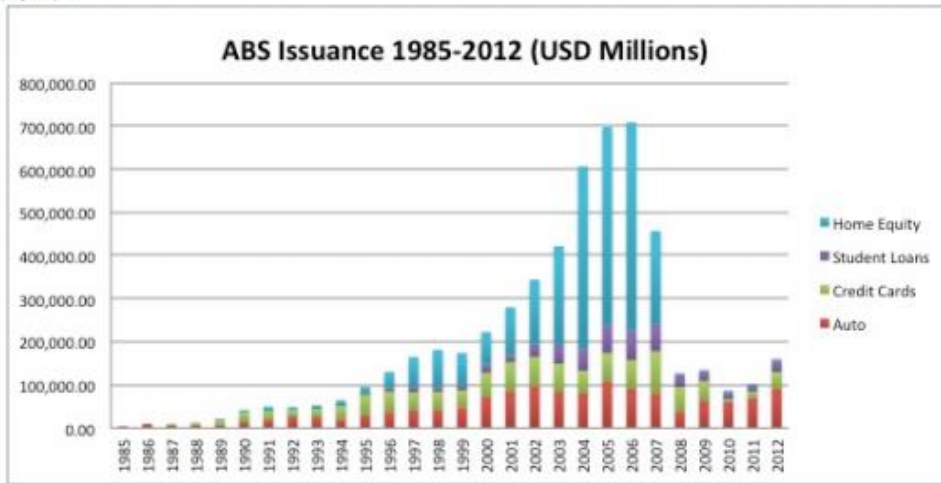
% of Total Count of loan_status for each last_fico_range_high. Color shows details about loan_status. The data is filtered on home_ownership and emp_length. The home_ownership filter keeps MORTGAGE, OWN and RENT. The emp_length filter keeps < 1 year, 10+ years and 5 years. The view is filtered on loan_status and last_fico_range_high. The loan_status filter keeps Charged Off and Fully Paid. The last_fico_range_high filter keeps 51 of 73 members.

Exhibit 2: Tranche Layout in Santander Auto Receivables Trust

- *first*, to the indenture trustee and the owner trustee, fees and reasonable expenses (including indemnification amounts) not previously paid by the servicer; *provided*, that such expenses and indemnification amounts may not exceed, in the aggregate, \$100,000 per annum;
- *second*, to the servicer, the servicing fee (including servicing fees not previously paid);
- *third*, to the Class A noteholders, interest on the Class A notes, pro rata;
- *fourth*, to the noteholders, the First Allocation of Principal;
- *fifth*, to the Class B noteholders, interest on the Class B notes;
- *sixth*, to the noteholders, the Second Allocation of Principal;
- *seventh*, to the Class C noteholders, interest on the Class C notes;
- *eighth*, to the noteholders, the Third Allocation of Principal;
- *ninth*, to the Class D noteholders, interest on the Class D notes;
- *tenth*, to the noteholders, the Fourth Allocation of Principal;
- *eleventh*, to the Class E noteholders, interest on the Class E notes;
- *twelfth*, to the noteholders, the Fifth Allocation of Principal;
- *thirteenth*, to the reserve account, an amount required to cause the amount of cash on deposit in the reserve account to equal the Specified Reserve Account Balance;
- *fourteenth*, to the noteholders, the Regular Allocation of Principal; and
- *fifteenth*, any remaining funds will be distributed to the certificate distribution account for distribution to the residual interestholder.

Exhibit 3³⁹: Asset Backed Security Issuance Trends

Figure 2.2



Source: Securities Industry and Financial Markets Association (SIFMA)

Exhibit 4: Total Loan Issuance of Lending Club

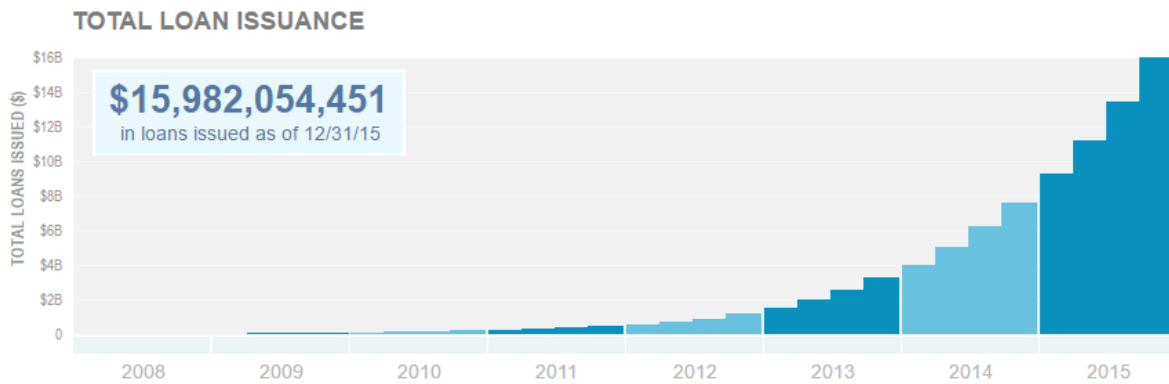
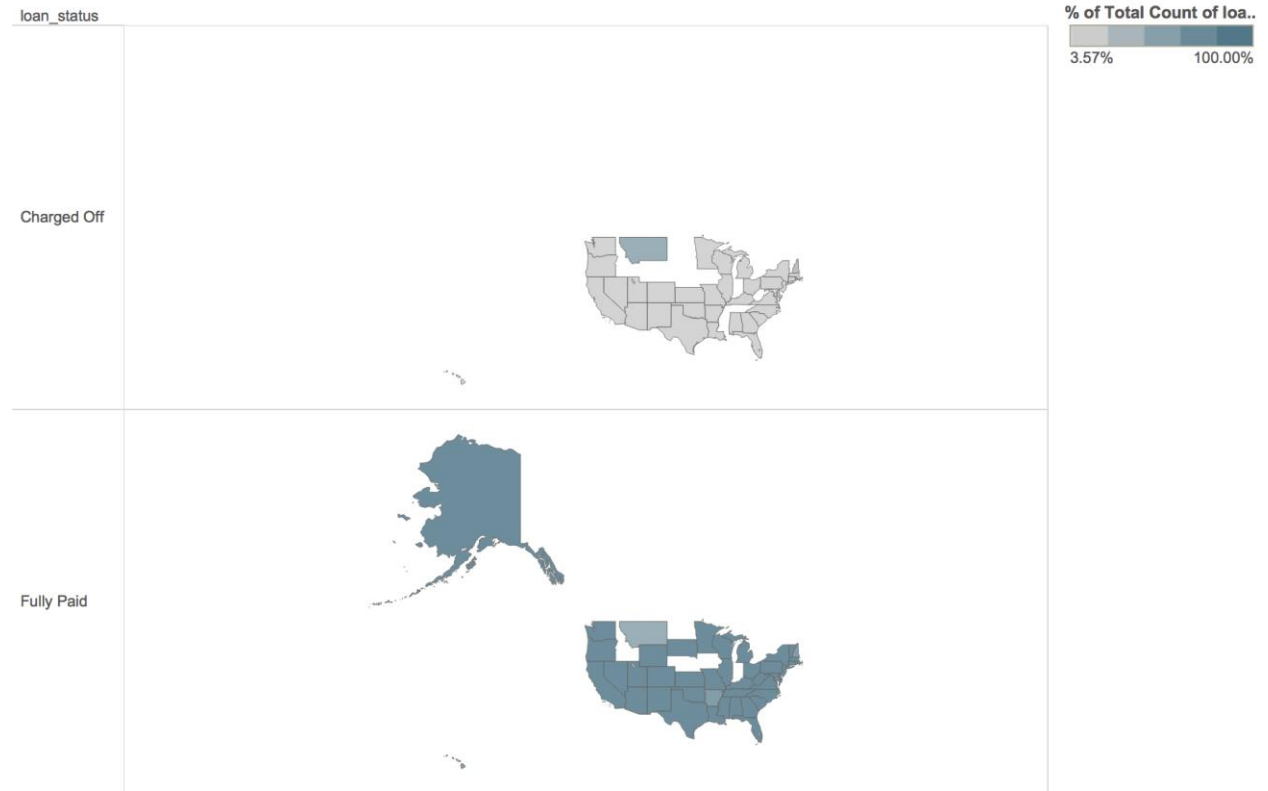


Exhibit 5: Loan Default by State

Map Defaults



Map based on Longitude (generated) and Latitude (generated) broken down by loan_status. Color shows % of Total Count of loan_status. Details are shown for addr_state. The data is filtered on fico_range_high and purpose. The fico_range_high filter keeps 39 of 45 members. The purpose filter keeps car. The view is filtered on loan_status, which keeps Charged Off and Fully Paid.

Exhibit 6: Loan Age at Time of Default

Loan Age at Time of Default

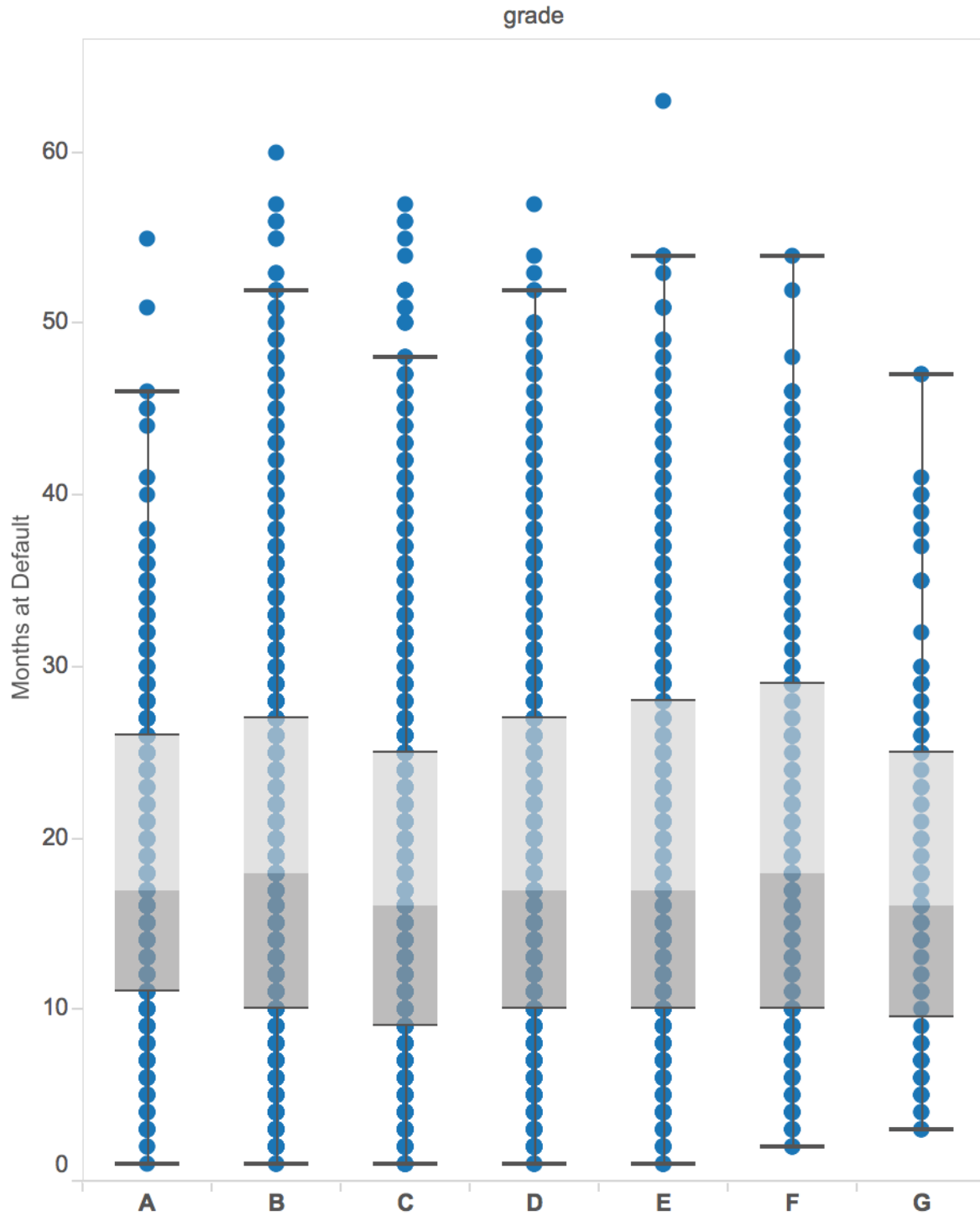


Exhibit 7: Charge off Rates from Lending Club by Subgrade

Charge Off Rates from Lending Club by Subgrade

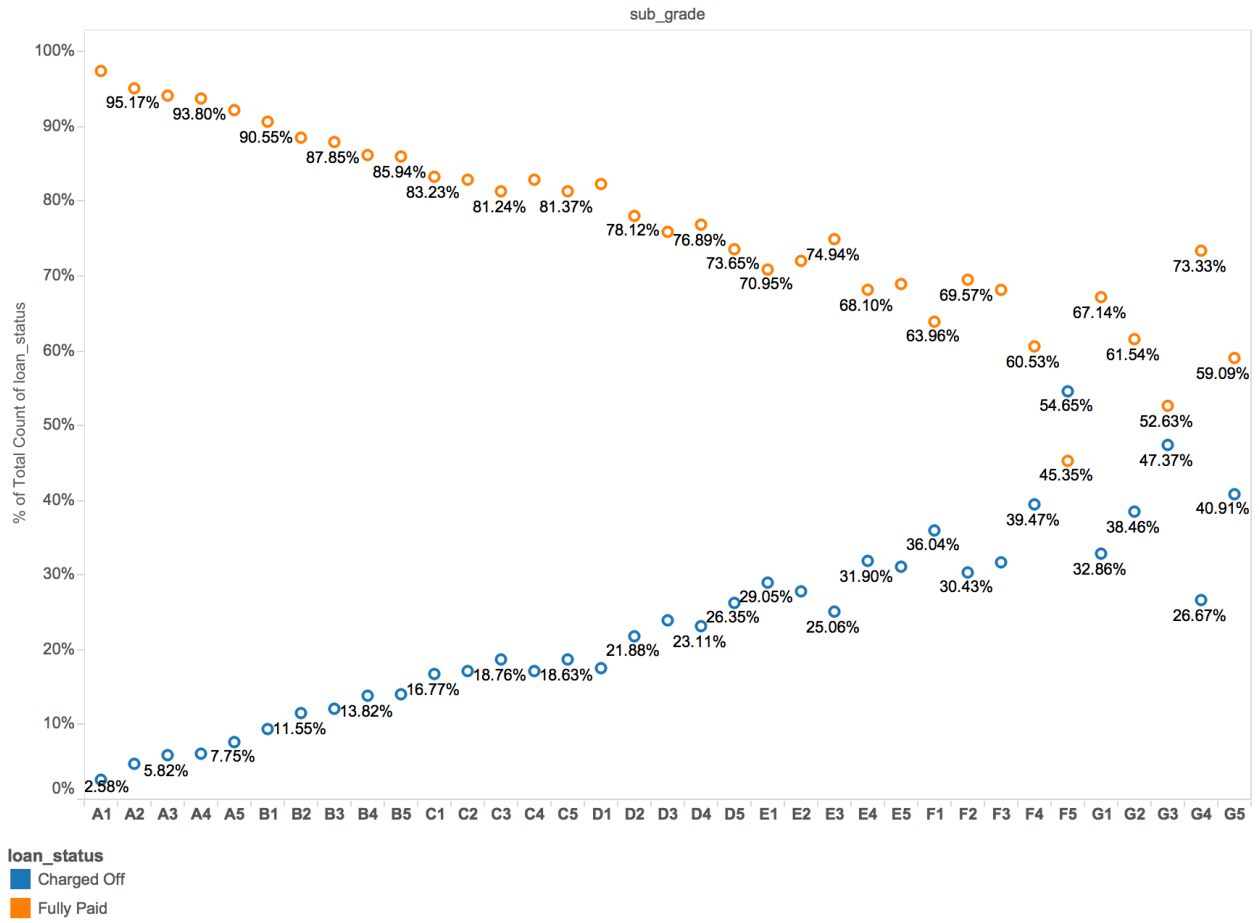


Exhibit 8: Charge off Rates from Lending Club by Grade

Charge Off Rates from Lending Club by Grade

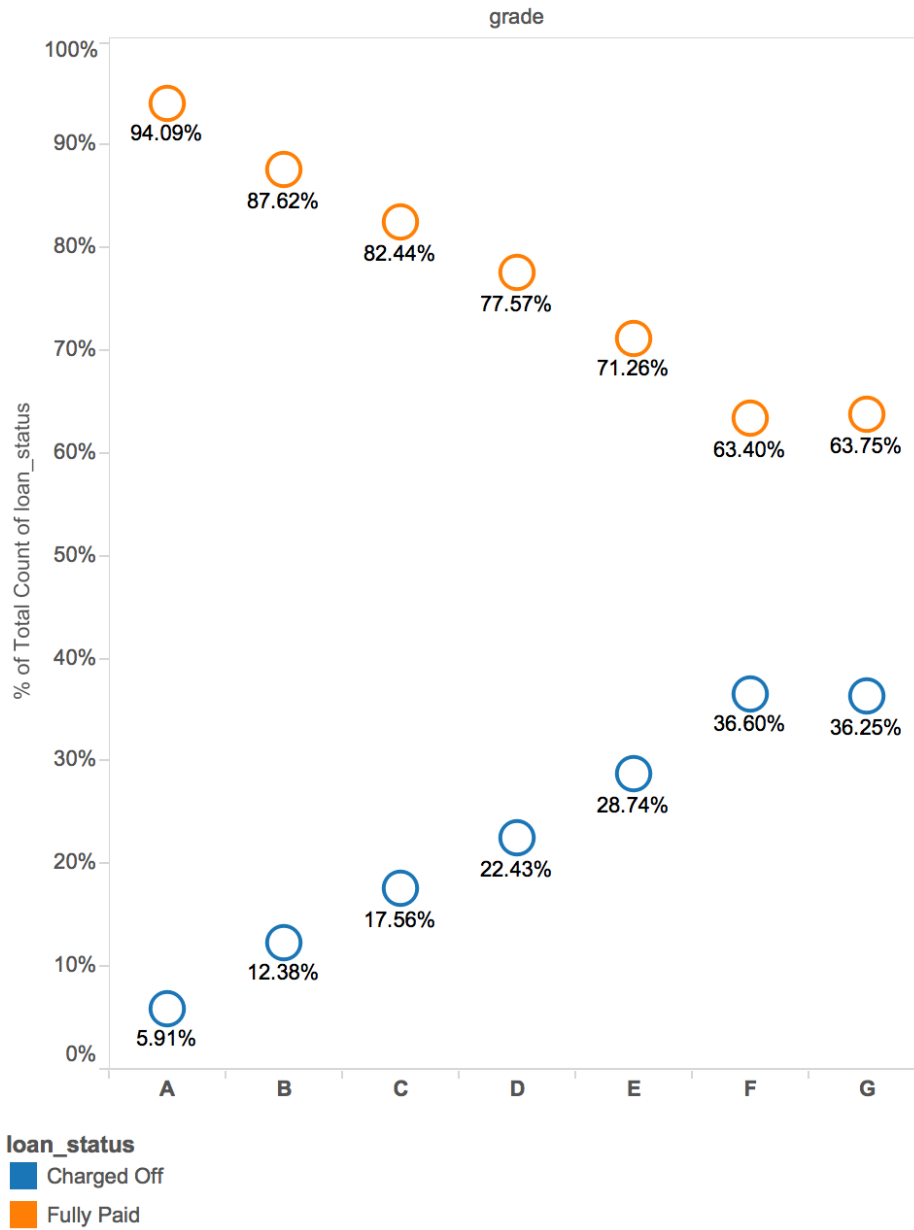


Exhibit 9: Cross Comparison of Lending Club and Prosper

Marketplace Summary													
Lending Club							Prosper						
Vintage	ROI	APR	Loss	Age(m)	Loans	Volume	Vintage	ROI	APR	Loss	Age(m)	Loans	Volume
2015	8.12%	12.94%	4.48%	9.94	421095	\$6,417,608,175	2015	6.92%	13.50%	5.46%	9.14	265027	\$3,660,741,443
2014	7.59%	14.06%	6.41%	22.06	235629	\$3,503,840,175	2014	6.57%	14.19%	6.64%	20.84	123196	\$1,598,745,694
2013	8.36%	14.80%	6.55%	33.56	134756	\$1,982,003,500	2013	9.01%	16.81%	6.82%	32.36	33907	\$357,384,811
2012	7.34%	14.57%	7.51%	45.28	53367	\$717,942,625	2012	8.34%	19.71%	10.46%	45.80	19553	\$153,175,121
2011	6.78%	13.18%	6.68%	57.80	21721	\$257,363,650	2011	9.71%	21.16%	10.37%	56.77	11228	\$75,138,012
2010	6.55%	12.43%	5.83%	69.71	12537	\$126,351,175	2010	11.03%	19.20%	7.22%	69.61	5652	\$26,940,486
2009	5.10%	12.81%	7.39%	81.38	5281	\$51,814,750	2009	10.06%	17.86%	7.00%	78.03	2034	\$8,886,296
2008	0.41%	12.37%	11.82%	95.31	2393	\$19,975,025							
2007	-2.20%	12.21%	14.80%	102.95	603	\$4,791,550							

Loan data is released quarterly. Last reported loan was 12/31/2015

Prosper 1.0 Returns