Emerging Finance in the Sharing Economy

A Case Study of Peer-to-Peer (P2P) Lending & Role of the Social Element

Jason Lejcak & Benjamin Wiltshire

The McLennan Howes Outstanding Honours Collaboration Scholarship Paper

2018

Abstract

The sharing economy continues to transform existing business models through greater competitiveness and efficiency. As a subset of the growing fintech sector, we consider the benefits and costs of P2P lending platforms from the perspective of multiple entities, to capture the multifaceted impacts of this new economic driver. One aspect we consider in detail is the social or environmental conscious investing by lenders on the platform. We conclude by conducting an empirical analysis to investigate the role of "socially responsible" P2P lending – specifically, lending to causes pertaining to renewable energy. We find that interest rates for green loans on the RateSetter platform are 2.1% lower on average, for a similar loan application. As a result, we encourage the development of loan markets for renewable energy investment within the P2P and community lending space.

THE UNIVERSITY OF QUEENSLAND AUSTRALIA

AUSTRALIAN INSTITUTE FOR BUSINESS & ECONOMICS

A Brief History of the Sharing Economy

"When you think about what a bank does for the masses; it's take deposits and make personal loans… You don't need to go to a bank to do that," says John Mack, former Morgan Stanley Chairman and CEO (Alloway et al., 2012).

As part of the online revolution, the advent of the sharing economy, including peer-to-peer (P2P) lending, is fundamentally changing the existing business of how we exchange goods and services. But prior to the Uber's and Airbnb's of the world, a change in consumer dynamics took place with the so called "service economy," as first put by economist Victor Fuchs. It has structurally transformed business in the Western world since the 50s – particularly in the US – and coincides with the early stages of the information revolution (Fuchs, 1975). The service economy has, for better or worse, become a more integral part of the aggregate economy, as traditional industry sectors like manufacturing continue to decline.

And as technology further progresses, business models continue to evolve. The service economy is now being complemented by a new trend, where people are not in the business to trade, but to share through new online platforms. We define the sharing economy as the use of previously unused or underutilised personal assets, such as a car or house, through various online and mobile platforms, to generate additional income. This has the potential to tap into billions of dollars of idle assets. It has been a very recent development, emerging in the late 2000s, and essentially provides an almost direct link between people with a surplus of goods, space, time, and/or money, with those who demand it. There are numerous benefits and costs to these new operating models, as they continue to challenge the existing business mantra, and provide new ways of improving the consumer experience. In fact, a key consideration these days is the increased demand for product-service offerings that are more environmentally friendly and deliver a positive societal or community impact.

An emerging area of the sharing economy is commercial finance and P2P lending, which includes companies such as Lending Club, the largest P2P platform. As part of our study, we examine the benefits and costs of these platforms from both the perspective of a lender and borrower, as well as from the broader perspective of the economy. One key insight that we investigate further is the social impact of P2P lending, and how investors, or providers of funds, place a higher economic value to renewable energy lending. In fact, we find that renewable

energy loans in the Green Loan lending market of RateSetter Australia, a P2P platform, has a 2.1% lower interest rate than a comparable loan for other purposes. This captures investor willingness to receive less return when a noteworthy social cause is involved. This segment continues to grow, with green loans already representing 7.6% of RateSetters's total portfolio as of September 2018.

Transparency Market Research predicts Global P2P market will be worth $898 billion by 2024 – up from $26 billion in 2015.

These platforms continue to challenge existing businesses too, with P2P lending moving away from the existing financial arrangement of intermediaries facilitating the flow of funds. Thus, banks in commercial finance must now compete with the sharing economy. A large part of this development follows the online revolution, which has transformed the way we interact.

The history of the sharing economy, more broadly, can be traced back to the dotcom bubble and the innovative retailers that developed an online platform and marketplace for products. EBay launched in 1995 as an online auctioneer and the first firm to combine search, review, and transaction tools, which now almost all sharing platforms use. Amazon launched in 1994, starting as a simple book retailer. It's now valued at US$900 billion and has recently launched its own online video streaming service. Alibaba, a Chinese company, launched just before the dotcom crash in 1999, has become a marketplace for international trade (Minifie, 2016). These businesses have connected billions of individuals worldwide, through online platforms that encourage peer-to-peer interaction and facilitate a marketplace for physical goods.

	Revenue (US$million)	Growth (YoY)	Value (US$billion)
Transport			
Uber	37,000[1]	85%[1]	72[1]
Accommodation			
Airbnb	2,600[1]	53%[1]	31[1]
Finance			
Lending Club	575[2]	15%[2]	1.5
Prosper	130[2]	37%[2]	0.6[1]

Table 1: Revenue as of 2017; Value is either latest market cap or private valuation. Source: Bloomberg[1]; company reports[2].

The second generation of the sharing economy began in the mid-2000s, with social media. While the idea of personalised user profiles and content sharing existed in the 90s, the widespread proliferation of social networks grew with Myspace, founded in 2003, and then Facebook in 2004. Facebook reached a significant milestone of a billion users in 2012 and now, as of January 2018, has a staggering 2.2 billion monthly active users. Twitter, launched in 2006, has 300 million users, as well as being a powerful platform for leaders in politics, business, and media. This second wave relates to the sharing of information and content by billions worldwide. Though, the business model for these platforms is not through the direct peer-to-peer exchange, but through advertising (Minifie, 2016).

The third generation, which we call peer-to-peer service platforms, emerged in the late 2000s, aided in large part by growth in the internet and the smart phone, such as the iPhone. It first came out in 2007, allowing us to communicate, share, and access information with greater efficiency, and more widespread adoption globally. With easier access to other people, the sharing economy continues to grow and thrive. The two most successful areas include transport and accommodation; both relate to the "sharing" of someone's personal car or home. Uber launched in 2009 and claims, on their website, to handle 40 million trips monthly in about 83 countries. Chinese ride-sharing firm Didi Kuaidi captures the global extent of this sector, as the firm claims even greater growth in active users than Uber.

Airbnb was founded in 2008 and has 4.2 million listings as of 2017. P2P lending is another subset of this third wave of the sharing economy. These platforms have openly expressed an objective to compete with banks and gain market share in personal lending. The largest provider in the US, and globally, is Lending Club, followed by Prosper. Although experiencing poor financial performance and a loan scandal in 2016, Lending Club alone has issued, based on their reporting, $38 billion worth of loans as of July 2018. In fact, in 2012, former Morgan Stanley Chairman and CEO, John Mack, joined the board of Lending Club, as other bankers have also made the migration to fintech in recent years (Alloway et al., 2012).

According to Rate setter, a P2P platform in the UK and Australia, 60% of survey respondents used at least one sharing service, and 58% of respondents would consider supplementing their income with the sharing economy (RateSetter, 2016). While other sectors of this third wave haven't proved to be as successful as transport and accommodation, finance is a growing space. These newer sharing services, like P2P lending and online outsourcing, have the highest discrepancy between current and expected use, with 2 times the number of people willing to use P2P lending compared with current usage. Considering this potential for growth, understanding the impact of the sharing economy on finance is more important than ever.

Evolution of the Sharing Economy
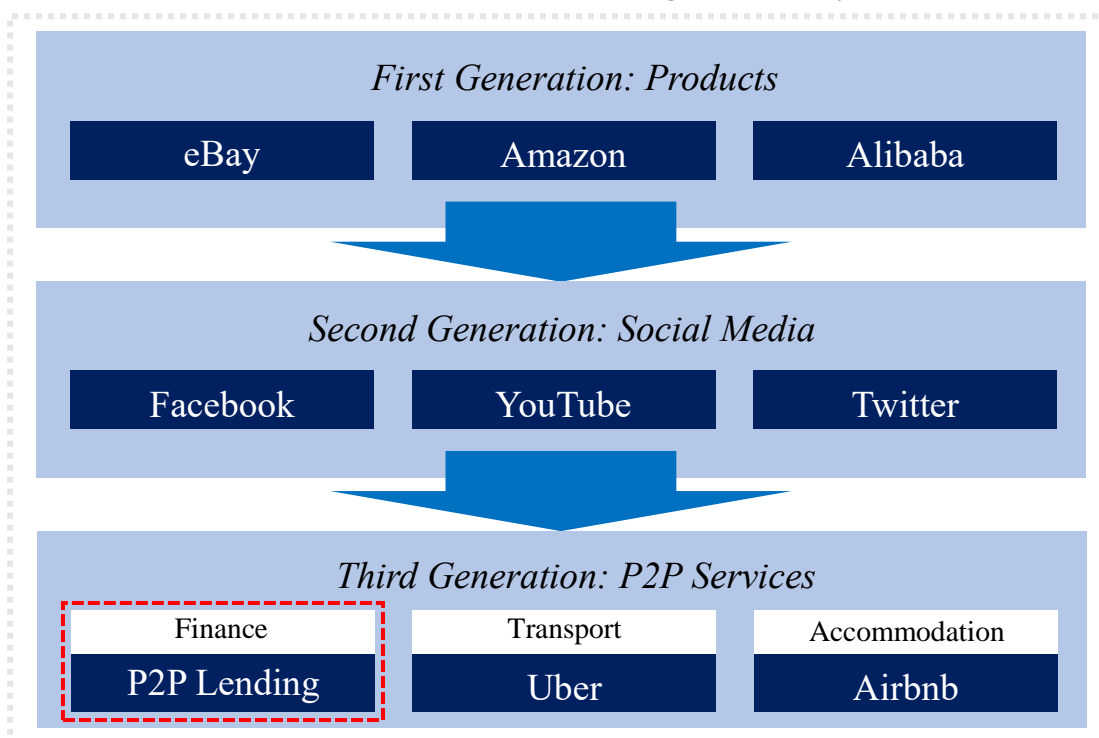
What is Peer-to-Peer (P2P) Lending?

P2P lending is an online platform that brings together investors, who are the providers of funds, and borrowers, who use the funds for a variety of purposes including personal expenditures, such as home improvements or car purchases. It's important to understand that P2P platforms are non-banking organisations and are not liable when borrowers default – though a number of protections exist for lenders.

Investors fundamentally decide how much they will invest into the platform and how it will be distributed. In Australia, usually the lender does not choose the specific loans, but rather the amount and interest rate to invest, as well as other characteristics. The platform then matches the funds to a borrower, and in this sense, acts as a matchmaker. Therefore, the service can be anonymous, with little information about the borrower actually seen by the investor. This business model does vary somewhat, depending on how much flexibility is offered to lenders. RateSetter Australia, for instance, asks for the amount to invest, term holding, and desired interest rate, with the choice to lend in the Green Loan lending market – loans used for renewable energy. But, importantly, no risk characteristics of the borrower are actually shown. Then, interest rates in each lending market, as determined by the different terms of the loan, are set by the supply and demand of funds[1]. On the other hand, P2P platform SocietyOne, allows you to select the desired asset classes, loan terms, and credit grades of the borrowers. Interest rates are then largely determined by the credit quality, as well as investor bidding[2].

Most of the loans are unsecured, and given the lower operational costs, may offer a better interest rate to investors as well as borrowers. As seen in Figure 2,
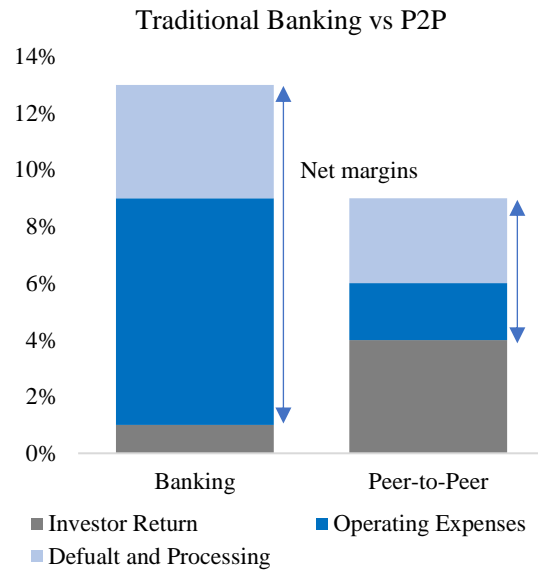

Figure 2. Hypothetical interest rate margin of a bank compared to P2P platforms (Source: Deutsche Bank, 2007).

which depicts a hypothetical interest rate margin of a traditional bank versus a P2P lending platform (Canstar, 2018).

The platform runs simple checks of the borrowers to ensure their credit history is sufficiently good and have the ability to make loan repayments. But again, the disclosure of the platforms as to the lending risk of each borrower varies by platform. While there is some involvement to ensure the credibility of a borrower, the investors ultimately hold the credit risk. And these products are not comparable to deposit accounts, since no government guarantee is extended in the event of default (ASIC, n.a.). This channel of direct finance, contrasts with the currently popular commercial banking channel of intermediaries, which rely on the banks being effective managers of credit risk.
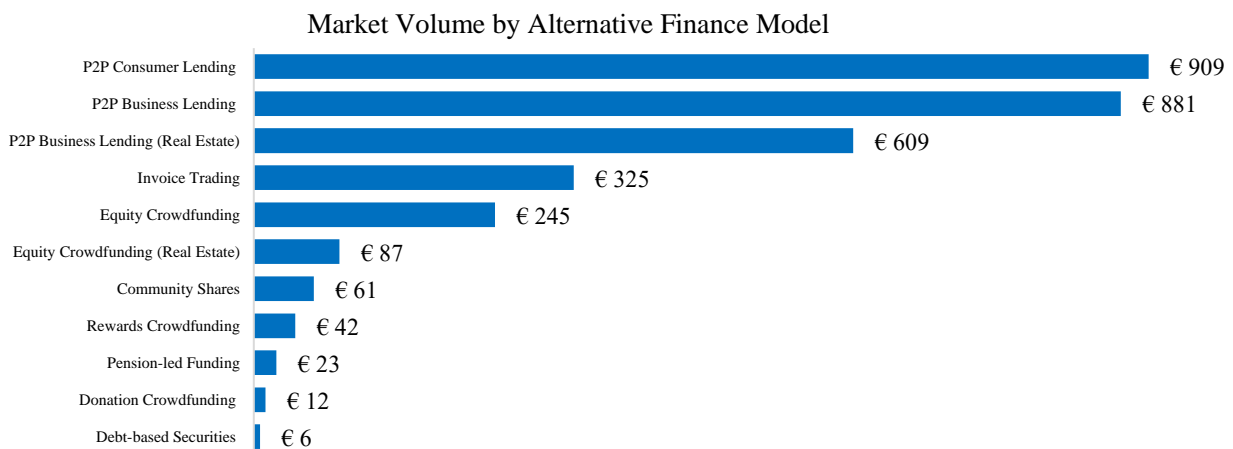

Market Volume by Alternative Finance Model

P2P Consumer Lending	€ 909
P2P Business Lending	€ 881
P2P Business Lending (Real Estate)	€ 609
Invoice Trading	€ 325
Equity Crowdfunding	€ 245
Equity Crowdfunding (Real Estate)	€ 87
Community Shares	€ 61
Rewards Crowdfunding	€ 42
Pension-led Funding	€ 23
Donation Crowdfunding	€ 12
Debt-based Securities	€ 6

Figure 1. Market volume across a range of different alternative finance models in Europe (Source: Deutsche Bank, 2007).

---

[1] RateSetter Product Disclosure Statement.

[2] SocietyOne FAQs.

P2P Lending from A Lenders Perspective

This section discusses some advantages and disadvantages of P2P lending from the perspective of lenders. The focus is more in terms of US lenders, as that is where the literature is more developed. Specifically, we look at the benefits of hedging, portfolio optimisation, access to fixed income investments, social impact investing, and peer group default mitigation as opposed to the risks of fraud and the low incentive for lenders with a low risk appetite.

Access to Fixed Income Investment: Morse (2015) proposes that P2P lending platforms allow investors access to the consumer loan market as a form of fixed income investment, when they would otherwise be unable to do so. This is beneficial for those small to medium sized investors seeking a fixed income instrument with a higher degree of risk than, for example, a corporate bond fund. Morse further highlights that it may also allow mortgage risk to be spread across the financial system and not concentrated in a small number of institutions.

Not Ideal for Low Risk Appetite Lenders: Low risk borrowers often qualify for cheap loans from traditional banks already. Hence, any low risk borrowers seeking finance in a P2P system often have very low rates compared to a "risk free" savings account (Meyer, 2007). Subsequently, Meyer suggests that P2P lending will never develop beyond a niche product in the segment for lending to high quality borrowers (as most tend to be mid to higher credit risk) and hence is not an attractive investment for a lender with a low risk appetite.
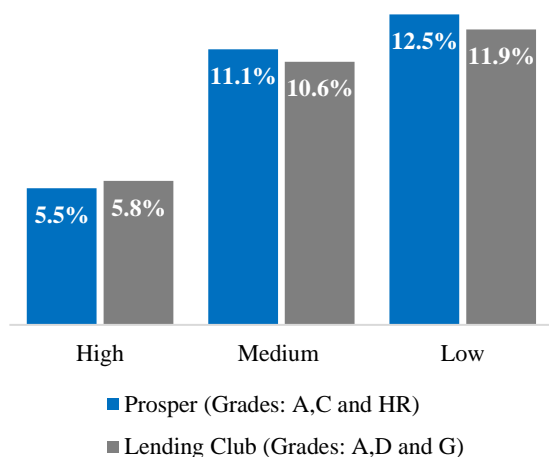
Cross-Platform Estimated Returns Per Lending Grade

Figure 3. P2P estimated returns for high, medium, and low lending grades (Source: ICMA Centre, 2013).

Peer Pressure Improves High Risk Borrower Discipline: There is empirical evidence demonstrating heightened payment discipline when peer pressure is involved (see e.g. Meyer, 2007 and Everett, 2015). This is enabled by the "community" like environment that some P2P lending platforms facilitate, usually those in the US and that allow selection of borrowers – often with a "name and shame" culture. Debtors have the option to join "groups", which tend to have much lower default rates. The effect is especially pronounced for high-risk and non-rated borrowers. Furthermore, empirical evidence has demonstrated that the effect of group membership significantly decreases loan default risk if the group enforces real-life in person connections (Meyer, 2007 and Everett, 2015). The literature also shows that loans with endorsements or bids by friends of the borrower have a higher rate of payment discipline.
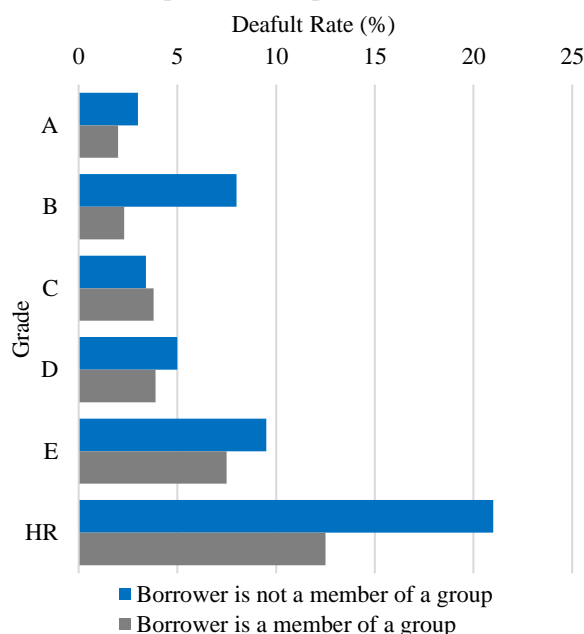
Group Membership &Default Rates

Figure 4. Group membership and default rates in P2P lending (Source: Deutsche Bank, 2007).

Fraud: There is the potential for fraud with P2P lending, as the platforms rely heavily on borrower and lender created content (Galloway, 2010). Specifically, P2P platforms have little to no ability to formally confirm the non-financial information borrowers provide. As outlined below (in the borrowers' perspective section) this "soft" information is often just as, if not more important in the credit application process. Thus, Galloway (2010) highlights that this not only generates the opportunity for fraud, but also places a large burden on lenders who are often amateurs with respect to

identifying fraudulent borrowers and inexperienced in evaluating social and financial criteria.

"Hedge Funds Smell an Opportunity as Peer-To-Peer Lending Rises"

Which50 - March 2016

Hedging and Portfolio Optimisation: Morse (2015) proposes that P2P lending platforms generate a unique circumstance whereby lenders can construct their own portfolio of investment loans enabling them to optimize portfolio selection. The practical examples that Morse outlines are that active hedge fund investors can use covariances to construct long-short or macro strategies with other instruments. Furthermore, for pension and endowment investors who seek liability-covering funds, the P2P platform offers short term realisations at risk premiums typically associated with longer-term instruments (Morse, 2015).

"Big Hedge Funds Are Investing in Peer-To-Peer Lending, Should You?"

The Franklin Society - November 2015

Social Impact Investing: A common theme throughout this article's outline of exiting P2P lending literature is the social element. This social element is not only instrumental in the application process, but also often heavily advertised by the lending platform. RateSetter Australia encourages lending to borrowers seeking the funds to invest in renewable energy, for example. Galloway (2010) proposes that lenders are often as interested in the social impact of their investment as the explicit financial return. Social impact bonds and other financial instruments alike can achieve this, but now smaller lenders and individuals have the opportunity to partake in social impact investing (Galloway, 2010).

P2P Lending from a Borrowers Perspective

This section discusses some advantages and disadvantages of P2P lending from the perspective of borrowers. Specifically, the benefits of soft information reliance and easier access to credit as opposed to the disadvantage of discrimination and potentially expensive lending rates.

Soft Information Reigns Supreme: There has been extensive empirical research into the characteristics most likely to generate funding approval on a P2P platform (see e.g., Lin, Viswanathan and Prabhala, 2011 and Kgoroedira, 2014). The overall consensus is that the decision to extend credit, and the pricing of the loan, may depend on the reputation of the borrower (i.e. social media following or simply personal reputation of the small business owner) as an additional or alternative source of information. This approach is less common in traditional commercial lending, which suggests a more unique criterion for credit lending on P2P lending platforms (Kgoroedira, 2014).

Discrimination: Padhi (2017) demonstrates that P2P lenders do not discriminate in terms of marketing and approving applications. However, the paper did find that borrowers in the US receive comparatively worse loan ratings ("grades") where there is a greater population of black residents in a given area. Padhi (2017) proposes that this suggests P2P lenders "redline" in the form of higher interest rates in areas with more black residents. A 2016 Wall Street Journal article documented that P2P investors directly use geography in their models of loan performance when they fund loans. This is concerning, as the practice of avoiding lending to people based on an area's average default rate, without regard to the individual merits of the potential borrower, is strictly forbidden for banks. Desmos and Dugan (2016) discuss how this issue highlights the regulatory grey area P2P lending finds itself in. These areas with high default rates that are "redlined" in P2P lending often have high minority populations (Padhi, 2017).

Greater Access to Credit – But at what Cost?: Greater accessibility of credit is widely considered an accepted benefit of P2P lending platforms (Padhi, 2017). This is the primary benefit to borrowers and the major "selling point" in attracting borrowers into P2P lending markets as opposed to conventional banking. However, as outlined above, there are a number of fair lending concerns. Specifically, P2P lenders are not subject to the same regulations as deposit taking institutions, which may explain the greater incidence of discrimination on P2P platforms, a problem often prevented in commercial bank lending. Nonetheless, policy maker reports often cite increased access to credit for borrowers as a primary benefit of P2P lending platforms (Padhi, 2017).

"Younger Australians Opting for Peer-To-Peer Lending Over Banks"

The Bull - October 2018

Expensive Form of Debt Financing: Empirical evidence suggests that an average P2P lending rate of between 18% and 20% in the US. Considering the information asymmetry associated with P2P lending and that banks typically refuse to extend credit at high interest rates, P2P can sometimes be considered to be a high cost finance option, with required returns similar to that of Business Angels and Venture Capital equity investments. This is largely a result of both the high information asymmetry and the types of customers seeking P2P lending (Kgoroedira, 2014). Specifically, they are often of a lower investment grade as they are unable to obtain financing through traditional avenues.
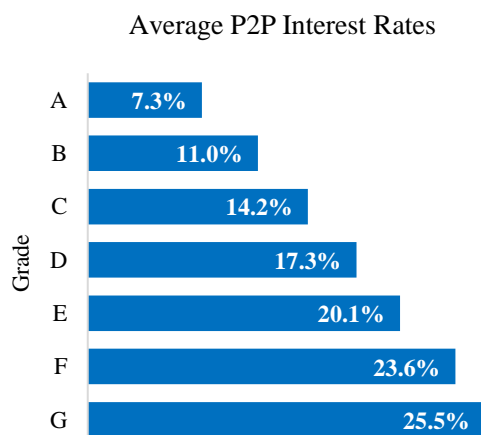
Average P2P Interest Rates

Figure 5. Average P2P interest rates per investment grade in the US (Source: Market Watch, 2015).

P2P Lending from a Market Perspective

This section discusses some advantages and disadvantages of P2P lending beyond the parties explicitly involved (borrowers and lenders). Specifically, the benefit of fostering market innovation, regulatory risk and the impact on traditional banking systems.

Fosters Innovation: Literature has demonstrated that P2P lending facilitates funding to the small business venture market (Kgoroedira, 2014). Specifically, early stage entrepreneurs and those looking for small amounts, who were unable to gain funding for their endeavours, are now able to potentially receive capital through P2P lending. Kgoroedira (2014) demonstrates that with these small business loans, the supply of funds tends to flow to the least risky entrepreneurs (e.g. homeowner with high credit ratings). However, P2P nonetheless provides a novel avenue for entrepreneurs and small business ventures to gain funding which fosters innovation in the wider market.

"Peer-to-peer (P2P) lending was started with the idea of connecting individual borrowers with individual lenders, but of late many variations of P2P lending has become popular. Business lending and in particular loans for Small and Medium Enterprises now forms a sizeable bulk "

The Economic Times - October 2018

Regulatory Risk of P2P Platforms and the Potential Ramifications on the Financial Sector: Governance and regulation is a much-discussed topic regarding P2P platforms. As outlined earlier, an example is the issue of P2P lending platforms utilising geography as a metric in lending, which is prohibited for banks.

Specifically, Desmos and Dugan (2016) highlight the issue of allowing lenders to look at geographic data, which then causes P2P lending to fall into a grey area regarding regulation. In this case, it is a product of online lending not being subject to the same fair-lending regulation as traditional banks.

"China's P2P Lenders say Regulation Will Cause Industry Collapse"

Financial Times - October 2018

The impact of internal P2P platform failure on the wider finance community is currently evident in China with the P2P lending market in turmoil.

"Beijing Struggles to Defuse Anger over China's P2P Lending Crisis"

Reuters – August 2018

Specifically, with the strong growth of P2P platforms, a recent "crackdown" by regulators has seen these platforms collapse and large losses experienced by investors. The large increase in defaulted P2P lending platforms in June and July of 2018 was a product of failure to become compliant with the requirements of new strict legislative changes. Furthermore, the reported consensus in China is that there are fears of the ripple effect of this turmoil on other segments of the financial sector that may be indirectly exposed to P2P lending (Yoon, 2018).
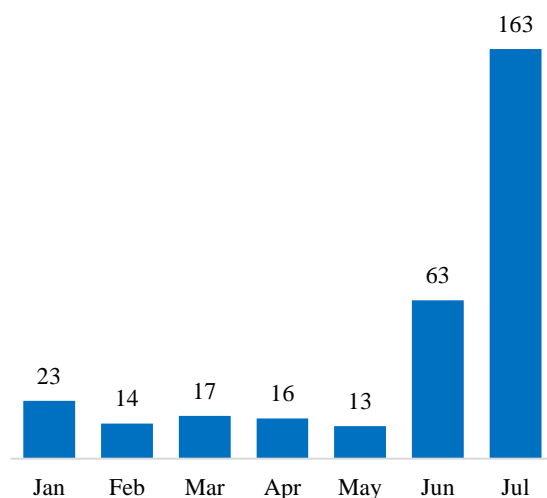
Defaulted Chinese P2P Platforms - 2018

Figure 6. The number of defaulted P2P platforms in China in 2018 (Source: TechCrunch.com, 2018).

Competition Risk for the Traditional Banking System: The impact of P2P lending on the traditional banking system was revisited in an empirical study through the Bank of England. In their 2016 report, they proposed two key impacts that the P2P lending systems will have on the conventional banking sector. First, lower rates on unsecured personal loans will generate competition and put downward pressure on bank profitability in relation to these product lines. Second, the P2P lending platform actually provides a model for conventional banks as they transition their distribution channels from "brick and mortar" branches to internet and mobile services. Despite the presence of P2P lending to fund business and real estate – the authors outline that they believe consumer credit is where banks will face the most competition.

A survey, as part of the 2014 Alternative Finance Industry Report, found that in the P2P market for personal loans, 59% of respondents sought funding from banks at the same time they applied for a P2P loan, and 54% were granted it but chose to fund themselves via the platforms. By contrast, in the market for P2P business loans, 79% sought funding from banks but only 22% were granted it.

Further Risk for the Traditional Banking System: In relation to wide spread financial instability beyond regulation risk, Padhi (2017) proposes that greater P2P lending could lead banks to take on more risk in order to compete. This would increase systemic risk in the financial system as banks are largely financed with deposits. The Office of Comptroller of the Currency, the United States' national bank regulator, included P2P lenders in its spring 2017 risk assessment of banks. This is explored by Padhi (2017) who outlines that for P2P platforms, loans are sold off to investors who can hold diversified portfolios. However, banks by nature hold concentrated loan portfolios on their balance sheets and are financed with leverage. The proportion of P2P loans in an investor's diversified portfolio is small, whereas a higher than expected rate of default could erode a significant amount of a bank's capital and potentially threaten other banks through contagion.

Perspective Summary & Social Elements

This section summarises the advantages and disadvantages of P2P lending from each perspective discussed and highlights the continued presence of social elements.

In terms of advantages and disadvantages of P2P lending, there are still many avenues of research to be conducted, particularly in international markets, as the literature is very US based. However, there are a few notions that researchers agree on. For borrowers, without a doubt, the biggest selling point of P2P lending is the increased credit availability that commercial lending may not offer. However, research has demonstrated that this increased credit availability may not only come in a higher lending rate, but also the potential for discrimination and redlining that commercial, highly regulated, lending facilities do not exhibit. Then, for lenders in the US and across the world, there is the financial advantage of exposure to fixed income investing that may not otherwise be available. However, the lack of regulation and potential for fraud, as well as changes in the regulatory environment as noted in the drastic case of China, creates platform risk and often leaves lenders bearing significant responsibility. For the wider market, the increase in credit availability potentially fosters innovation, however the opaque nature and low governance of P2P lending further highlights platform risk and financial instability concerns which are beginning to be flagged by regulators and investors.

One theme we explore in more depth is the social element of P2P lending. Broadly this includes such topics as the importance of social elements in the approval and pricing of a loan, and the community nature of P2P platforms. One concept proposed by Galloway (2010) is the notion of a social impact index. Many P2P platforms have developed credit rating indexes to compliment a borrower's credit rating score. The paper proposed that a social impact index should be presented alongside financial metrics of P2P platforms to capture the social impact of the investment. The remainder of this article empirically analyses data from the Australian P2P lending market to investigate the role of "socially responsible" P2P lending – specifically, lending to causes pertaining to renewable energy. This is investigated in line with the notion Galloway (2010) proposes of the role of social impact in lending decisions on a P2P platform.

Social Impact Lending

We use data from the P2P platform, RateSetter. The company was founded in the UK in 2009 and expanded to Australia in November of 2014. The Australian data is publicly available, to ensure transparency of the P2P lending market. It contains data of all loans provided on the platform since inception, which in aggregate represents AU\$353 million of lending over 4 years (from 2014 to 2018), and 26,948 loans.

Year	Green (AU\$thousands)	All Loans (AU\$thousands)	Ratio
2015		20,000	
2016	9	61,309	
2017	2,100	127,100	1.7%
2018	11,000	144,000	7.6%
Total	**13,109**	**352,409**	

Table 2. Data available up until September of 2018. Source: author calculations; RateSetter (2018).

A variable describing the purpose of the loan is part of the data and captures 14 different categories, from debt consolidation to home improvement. We create a socially beneficial indicator variable, called "green," that includes any lending with the purpose of renewable energy. Note that although investors in the platform cannot choose individual loan categories or borrowers, they can opt to lend in the Green Loan lending market. This includes funding for solar energy batteries, solar energy equipment, solar energy panels, solar water heaters, and variable speed drives (most relate to rooftop solar panels). We also create a more concise definition for other categories in order to more compactly present them here (Appendix C).

As seen in Table 2, these socially beneficial loans have increased as a proportion of all loan types, which includes personal funding. In 2018, it represents 7.6% of

Average in 2018			
Purpose	**Rate**	**Term** (months)	**Amount** (AU\$)
Business	7.4%	41.3	21,016
Car	7.8%	43.4	14,348
Debt Cons.	8.0%	44.3	9,524
Personal	7.3%	40.4	13,416
Prof. Services	4.2%	15.8	8,222
Green	7.0%	64.2	8,947

Table 3. Source: author calculations; RateSetter (2018).

the lending pool. A similar narrative is evident when we depict all major loan categories. See Figure 7, with the total borrowing amounts over time. Loans for renewable energy can be seen as a very fast-growing category.

In Table 3, we show the average interest rate, maturity, and loan amount for each category. Green loans tend to have rates in line with other categories but notice the much longer term of these loans. Given the term premium, one would expect these loans to have a higher lending rate. On average, $8,947 is usually borrowed for an investment in renewable energy, which is below the average of other categories. The highest amount is borrowed for business purposes. The average interest rate for all categories appears to be lower than what might be expected of a P2P platform. This may be due to RateSetter being more involved in assessing the borrower's creditworthiness than other P2P platforms, especially those in the US. But one can see the highest interest rate, unsurprisingly, relates to debt consolidations.

Our hypothesis is that these green loans have a lower interest rate, even after accounting for individual risk characteristics of the borrower and term of the loan. We therefore estimate the linear regression for each loan i,

$$R_i = \beta_0 G_i + \sum_{j=1}^{2} \beta_j T_i^j + \delta Y_i + \gamma X_i + \epsilon_i$$

Where R_i is the annual rate of the loan, T_i is the length of the finance contract – being a polynomial, G_i is a binary
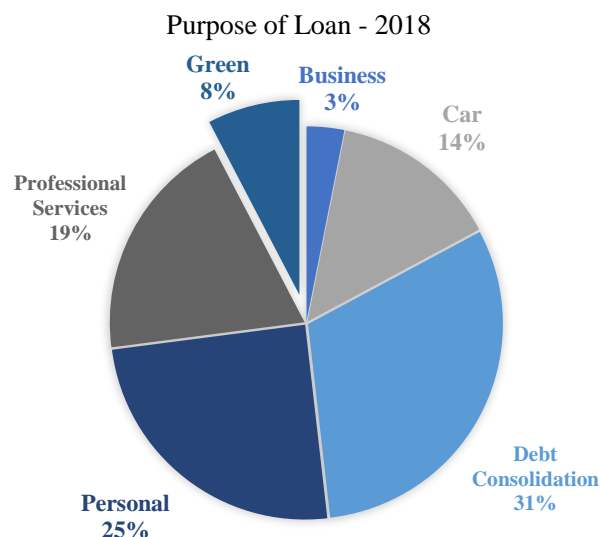

Purpose of Loan - 2018

Figure 8. Proportion of loan categories on the RateSetter platform for the year 2018. Source: author calculations; RateSetter (2018).

variable for whether or not the loan is related to renewable lending, Y_i are year dummies, and X_i are all other controls, such as the loan amount, income, state, employment status, and etc (See Appendix B for a full list of variables). While there is no variable for a specific credit rating, the observed characteristics of the borrower act as good proxies for credit risk. We run other models too, as a form of robustness check, which can be found in Appendix A.

A very significant variable is the term of the loan, as to be expected. We model the term structure as a

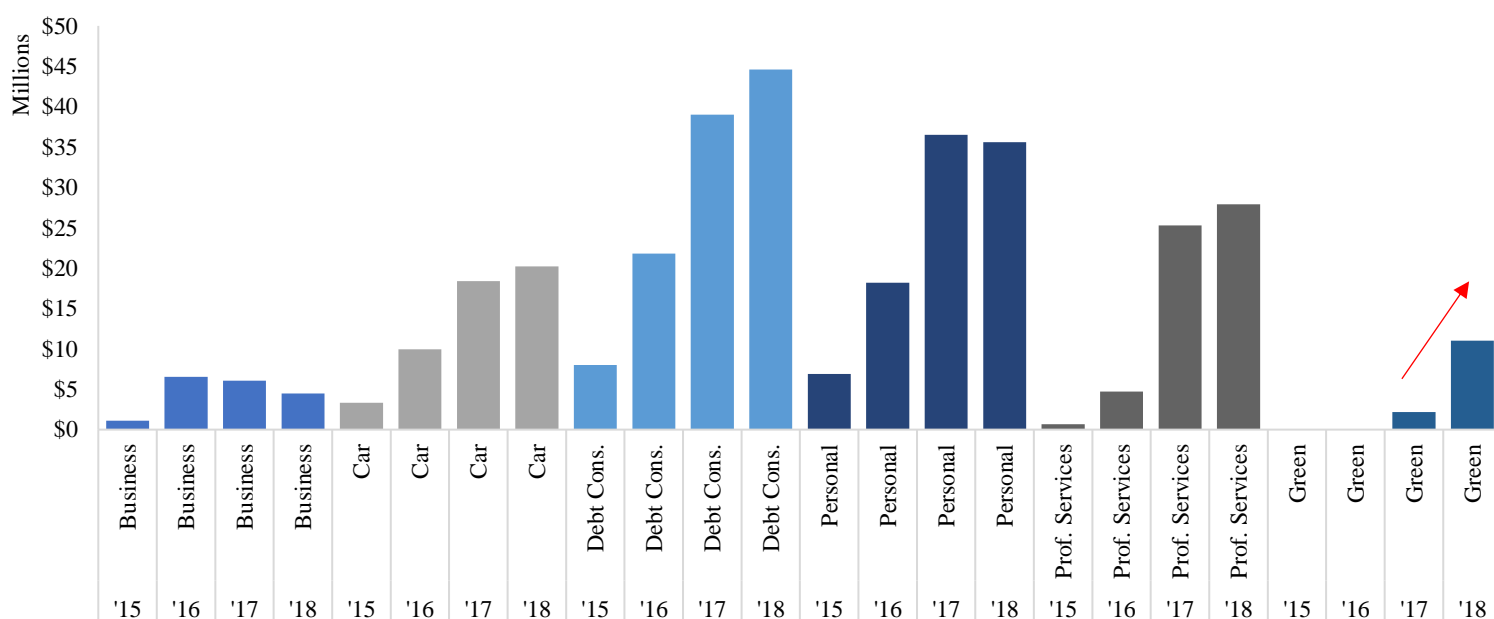Total Amount Borrowed Across Purpose Category over Time

Figure 7. Purpose of loan definition can be found in the appendix. This represents the total amount lent within each category for each given year.

polynomial of order 2, known as a quadratic, which is a straightforward way of modelling the term structure of interest rates. A higher degree of polynomials may fit the data better, but a quadratic yields a reasonably shaped curve and doesn't overfit the data. Given the signs of the coefficients we find the term structure to have a positive gradient from 0 to 70 months. This is consistent with an upward sloping term structure, driven in large part by a premium for borrowing over a longer time horizon. If we are at the average loan term of 34 months (about 3 years), a 6 month increase in borrowing increases the annual rate by 1.6% on average.

Studying our coefficient of interest, β_0, we see lending to renewable projects reduces the interest rate on the loan by a substantial 2.1%, significant at the 1% level. That is, for an individual with the same income, house ownership status, state of residence, age, employment status, and year of borrowing, a loan related to renewables will have an interest rate of 2.1% per annum less than a loan for all other purposes. Our R^2 is equal to 89.0%, reflecting a very high degree of variation in interest rates being captured by our model. Clearly, these green loans attain a lower borrowing rate, meaning investors are actually submitting a lower desired return when opting to lend in the Green Loan lending market.

We also test the impact of discrimination, as literature in the US has highlighted race-based discrimination in the past. While we do not have the race of the borrower, we find gender is insignificant. However, looking at age, borrowers in the 80-89 age bracket face a 45-basis point higher rate on average, significant at the 5% level, even after controlling for income and home ownership. But, expectedly, the proportion of these borrowers tends to be very low. See Appendix B for a full list of the variables included as controls within the regression.

Conclusion

Peer-to-peer (P2P) lending, a subset of the third generation of the sharing economy, is a fast-growing field that continues to threaten the traditional operations of commercial banking. In the article, we covered a historical overview of the sharing economy and where P2P fits in this shifting narrative. We also discussed the mechanics of the lending platform as a brief introduction to how these platforms work. Then the pros and cons were analysed from the perspective of lenders, borrowers, and the broader economy. This provides a fundamental overview of where the risks lie for P2P, as well as how it can improve existing commercial finance.

Throughout the article we mentioned the impact of socially positive lending in the P2P space. By taking data from a popular Australian platform, RateSetter, we were able to quantitatively estimate the impact of lending to comparable borrowers for the purposes of renewable energy investment. These small loans, used largely for rooftop solar, show that investors are willing to accept a lower rate if the investment is socially responsible. It was also noted that green loans continue to grow within RateSetters's portfolio, and already represent 7.6% of the total portfolio as of September 2018. RateSetter is one of the only platforms that has a Green Loan lending market, and given investor willingness to accept a lower rate for such lending, these initiatives could be considered for other P2P or community based platforms. Indeed, the green loan segment within community and P2P lending has been largely unaddressed by literature, despite its fast-growing nature. In line with the proposal of Galloway (2010), this finding suggests the inclusion of social impact metrics with P2P lending platforms may be a valuable incorporation for both P2P platform operators and users.

-2.1% Change in interest rate of comparable loan, if for renewable energy.

References

ASIC (n.a.). Peer to Peer Lending. Retrieved from https://www.moneysmart.gov.au/investing/managed-funds/peer-to-peer-lending

Alloway, T., & Moore, M. (2012). Mack Moves to Cutting Edge of P2p Lending. Retrieved from https://www.ft.com/content/4fc03862-8952-11e1-bed0-00144feab49a

Bank of England. (2016). *Peer-To-Peer Lending and Financial Innovation in the United Kingdom*.

Bergethon, K. (2015). Big Hedge Funds Are Investing in Peer to Peer Lending, Should You?. Retrieved from https://thefranklinsociety.com/peer-to-peer-lending-investing/

Birmingham, A. (2016). Hedge Funds Smell An Opportunity As Peer To Peer Lending Rises. Retrieved from https://which-50.com/hedge-funds-smell-opportunity-peer-peer-lending-rises/

Canstar (2018). P2P lending: The '101' of peer-to-peer lending. Retrieved from https://www.canstar.com.au/p2p-lending/what-is-peer-to-peer-lending/

Deutsche Bank Research. (2007). *Online P2P Lending Nibbles at Banks' Loan Business*.

Desmos, T., & Dugan, J. (2018). Online Finance Draws on Geographical Data, Raising Questions. Retrieved from https://www.wsj.com/articles/online-finance-draws-on-geographical-data-raising-questions-1457482366

Everett, C. (2015). Group Membership, Relationship Banking and Loan Default Risk: The Case of Online Social Lending. *SSRN Electronic Journal*.

Fei Ju, S., & Weinland, D. (2018). China's P2P Lenders Say regulation will cause industry collapse. Retrieved from https://www.ft.com/content/eac2c2de-d050-11e8-a9f2-7574db66bcd5

Fuchs, V. (1975). Who Shall Live? Health, Economics and Social Choice. *World Scientific*.

Galloway, I. (2010). *Peer-To-Peer Lending and Community Development Finance*. Federal Reserve Bank of San Francisco.

Gandhi, R. (2018). Five Reasons Why P2P Lending is Ideal for Small Business Lending. Retrieved from https://economictimes.indiatimes.com/small-biz/money/five-reasons-why-p2p-lending-is-ideal-for-small-businesses/articleshow/49284976.cms

Glenn, E., & Zhang, S. (2018). Beijing Struggles to Defuse Anger Over China's P2P Lending Crisis. Retrieved from https://www.reuters.com/article/us-china-lenders-p2p-insight/beijing-struggles-to-defuse-anger-over-chinas-p2p-lending-crisis-idUSKBN1KX077

Hudson, T. (2018). Younger Australians Opting for Peer-To-Peer Lending Over Banks. Retrieved from http://www.thebull.com.au/articles/a/77561-younger-australians-opting-for-peer-to-peer-lending-over-banks.html

Kgoroeadira, R. (2014). *The Impact of Commercial Peer-To-Peer Lending Websites on the Finance of Small Business Ventures*. Cranfield School of Management.

Lin, M., Prabhala, N., & Viswanathan, S. (2011). Judging Borrowers by the Company They Keep: Friendship Networks and Information Asymmetry in Online Peer-to-Peer Lending. *SSRN Electronic Journal*.

Liu, J. (2018). The Dramatic Rise and Fall of Online P2P Lending in China. Retrieved from https://techcrunch.com/2018/08/01/the-dramatic-rise-and-fall-of-online-p2p-lending-in-china/

Minifie, J. (2016). Peer-to-Peer Crowdfunding: Information and the Potential for Disruption in Consumer Lending. *Annual Review Of Financial Economics*, *7*(1), 463-482.

Morse, A. (2015). Peer-to-Peer pressure: Policy for the Sharing Economy. *Grattan Institute.*

Padhi, M. (2017). *The Effects of Peer-To-Peer (P2P) Lending on Competition, Discrimination and Financial Stability*. University of Maryland.

RateSetter (2016). RateSetter Sharing Economy Trust Index: Winter 2016. Retrieved from https://www.ratesetter.com.au/blog/posts/ratesetter-sharing-economy-trust-index-winter-2016

RateSetter (2018). Loan book update – September 2018. Retrieved from
https://www.ratesetter.com.au/blog/posts/loan-book-update-september-2018

Scott-Quinn, B. (2013). Peer To Peer (P2P) Lending. Retrieved from https://www.icmacentre.ac.uk/peer-to-peer-p2p-lending-bank-on-dave-and-many-others/

Transparency Market Research. (2014). *Peer-to-Peer Lending Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast 2016 - 2024*.

University of Cambridge: Judge Business School. (2017). *The 2nd Asia Pacific Region Alternative Finance Industry Report*.

Van Doorn, P. (2016). Why Income Investors Should Consider Peer-To-Peer Lending. Retrieved from https://www.marketwatch.com/story/why-income-investors-should-consider-peer-to-peer-lending

Yoon, E. (2018). China's P2P Lending Meltdown. Retrieved from https://www.cnbc.com/video/2018/08/07/chinas-p2p-lending-meltdown.html

Appendix A: Regression Output

The regression results we discuss in the report come from Model (2). We also run a regression (labelled Model 1), with all other financial categories, omitting personal loans. Therefore, the comparison rate is of a personal loan, rather than all other loans. Lastly, Model (3) and (4) tests the robustness of our order of polynomials, with a cubic and quartic function. It still presents a significant coefficient on Green, though with a somewhat lower magnitude. Though the term structure is more unusually shaped and may be overfitting the data.

Dependent var:	(1) Annual Rate	(2) Annual Rate	(3) Annual Rate	(4) Annual Rate
Term	0.289^{***}	0.259^{***}	0.0654^{***}	-1.229^{***}
	(146.73)	(171.24)	(16.84)	(-81.20)
$Term^2$	-0.00213^{***}	-0.00183^{***}	0.00342^{***}	0.0596^{***}
	(-95.60)	(-98.40)	(34.03)	(97.66)
$Term^3$			-0.00004^{***}	-0.001^{***}
			(-52.45)	(-101.01)
$Term^4$				0.00001^{***}
				(100.04)
Log Amount	0.109^{***}	0.132^{***}	0.134^{***}	0.108^{***}
	(9.36)	(11.56)	(13.77)	(18.23)
Green	-1.864^{***}	-2.104^{***}	-1.337^{***}	-1.914^{***}
	(-55.83)	(-64.83)	(-31.78)	(-57.09)
Debt Consolidation	0.0977^{***}			
	(6.17)			
Business	-0.0664^{*}			
	(-1.89)			
Professional Services	0.737^{***}			
	(32.31)			
Car	0.0626^{***}			
	(3.52)			
N	26,948	26,948	26948	26,948
R^2	0.90	0.89	0.90	0.96
Std. error	0.83	0.85	0.79	0.52
Controls	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

t statistics in parentheses
$^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

Appendix B: Control Variables

The following are control variables included in the regressions presented within the article. Definitions are taken directly from RateSetter. Note that they are all presented as categorical data in the downloadable spreadsheet. This then requires dummy variables to indicate a borrower is within a certain age bracket, income bracket, gender, etc.

Name	Description
State	State in which the borrower lives
Age	Age of borrower
Employment Status	Employment status of borrower at time of entering the finance agreement
Borrower Income	Gross annual income of the borrower at the time of entering the finance agreement
Housing Status	Describes the housing status of the borrower at the time of entering the finance agreement
Gender	Gender of borrower
Early Payments Made	Borrower has made additional payments over and above those set out in their repayment schedule

Source: RateSetter (2018)

Appendix C: Loan Purpose Categories

RateSetter has 14 different loan categories, which we consolidate into 6 major categories for the graphs presented in the report. These are defined as follows:

Name	Description
Business	Business or investment purposes
Car	Funding which involves a car/vehicle
Debt Consolidation	A loan used to consolidate a number of debts held by the borrower
Personal	Home improvement, a major event, a major purchase, or other consumer loan
Professional Service	Any loan used to pay for a professional service, such as tax services
Green	Solar energy batteries, solar energy equipment, solar energy panels, solar water heater, and variable speed drive