

State of the Art Review

Online Peer-to-Peer lending – what do we know, and where are the gaps?

Anastasia Ri

ERC and Aston Business School

a.ri@aston.ac.uk

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In this review we examine the existing literature to highlight what we do (and what we do not) know about online peer-to-peer (P2P) lending and borrowers. Firstly, extensive studies relate different personal attributes to the outcomes of loan application, differences in interest rates, and probability of default. Secondly, information asymmetry is found to be the core issue in P2P lending. Therefore, a growing body of literature addresses financial innovations of P2P platforms, fundamentally new ways of producing and transmitting information. The third important strand of literature attempts to answer if P2P lending is a substitute or a complement of traditional bank lending. While consumer P2P lending attracted much of attention of researchers, P2P business lending is yet understudied. To date, we know little about small businesses who raise funds on P2P platforms, especially what motivates them to choose this particular source of finance, what are the antecedents of their relationship with traditional finance, and what are the outcomes of P2P loans? Overall, there is a need to understand the impact of P2P lending on the SME funding gap and more broadly on financial inclusion.

Background

P2P lending, also known as *marketplace lending*¹, refers to debt-based transactions between individual lenders (also called funders or investors) and borrowers (or fundraisers) facilitated by an online platform (Baeck, Collins & Zhang, 2014; Atz & Bholat, 2016). P2P lending, unlike traditional bank lending, does not involve financial intermediation: the risk is beared directly by individual lenders while the platform's balance sheet is not exposed to it. P2P models generate revenues from the fees and commissions received from borrowers and investors and not from interest rates (Deloitte, 2016; Dore & Mach, 2019; Vallée & Zeng, 2019). Each loan application is usually funded by multiple investors to minimise exposure to the default risk.

At the forefront of financial innovation, the UK is the country where online P2P lending was born: Zopa, launched in 2005, was the first P2P platform in the world providing personal unsecured loans; Funding Circle, launched in 2010, was the first to offer

business loans. The phenomenon has spread quickly all over the world, especially in the USA and China where the highest amount of P2P lending activity is taking place currently. Hulme and Wright (2006) suggest that P2P lending emerged as a response to social trends and as a demand for new forms of relationship in financial sector in the new digital era. It received further stimulus as a result of tightening credit market during financial crisis: low interest rates on savings encouraged individuals to seek alternative investment opportunities and better quality borrowers started to look for alternatives to bank lending as banks deleveraged (Atz & Bholat, 2016; Bruton et al., 2015).

Today, fifteen years after the launch of the first platform and following an impressive exponential growth over the last decade, online P2P lending is well established as part of the UK and world's financial landscape and as one of the most important alternative sources of finance, both for consumers and small businesses². According to the latest UK Alternative Finance Industry report, total amount of new P2P loans to businesses and individuals attained £4.66 billion in 2017. *P2P business lending* (excluding real estate and property development) was the most rapidly growing and the largest segment with a volume of £2.04 billion. When compared with the amount of new bank loans to SMEs this corresponds to a substantial share of 9.5% (Zhang et al., 2018).

Evidence

The “Market for lemons” problem arising from information asymmetry, as described by Akerlof (1970) is particularly relevant for P2P lending. There are no face-to-face interactions and relationship building between borrowers and lenders. Therefore, financial decision is based on available information, either provided by P2P platform through pre-screening or collected by lender themselves based on further screening (Vallée & Zeng, 2019). In these circumstances, “soft” information, such as perception of creditworthiness, trust, and attitudes towards risk become extremely important (Iyer et al., 2016; Duarte, Siegel & Young, 2012; Guiso, Sapienza & Zingales, 2013). Lenders may take their decision to fund a loan making some assumptions based on observations of average “statistic”: different personal characteristics of a borrower such as ethnicity, gender, social networks, and even personal appearance come into play. This might not necessarily reflect prejudice or taste-based discrimination, but profit-maximising behaviour (Akerlof, 1970; Chadeaux & Helbing, 2012). The last is confirmed by recent evidence suggesting that investors are mainly motivated by financial return on investment (Pierrakis & Collins, 2013; Baeck, Collins & Zhang, 2014).

Therefore, P2P lending provides a good ground for natural experiments for analysing financial behaviour. The growing academic literature focuses on links between, on one hand, *personal attributes of borrowers*, and on the other hand, the outcomes of loan application, differences in interest rates, and probability of default. The evidence is built using personal loans data for both consumer purposes (such as home improvement, automobile purchase, debt consolidation, bridge loans, etc.), and business purposes (issued to owner as an individual) from large US and Chinese P2P platforms (see *Table 1*).

These studies suggest that there is a statistically significant relationship between trustworthy appearance (Duarte, Siegel & Young, 2012), education (Chen, Zhang & Yin 2018), social networks (Lin, Prabhala & Viswanathan, 2013; Freedman & Jin, 2017), and probability of funding success and interest rates. However, this is generally justified as the default rates are lower among more educated, trustworthy appearing

borrowers with better social ties. There is a mixed evidence concerning gender and physical 'attractiveness'.

Table 1: Personal characteristics of P2P borrowers and loan outcomes

Personal attributes	Loan application outcomes / loan performances	Study	P2P platform & type of loans	Principal empirical results
Race	<ul style="list-style-type: none"> • Probability of funding success; • Interest rate; • Probability of default 	Pope & Sydnor (2011)	<u>Prosper (USA)</u> Consumer and personal loans for small business*	Evidence of racial statistical discrimination: loan listings with African Americans in the attached photos are 25 to 35% less likely to be funded; they are also likely to pay higher interest rates but they are not high enough to count for the higher probability of default. Evidence of discrimination against elder and overweight persons; listings without photos are less likely to be funded.
Gender	<ul style="list-style-type: none"> • Probability of funding success 	Barasinska & Schäfer (2014)	<u>Smava (Germany)</u> ; Consumer and business loans	No evidence of gender discrimination: women and men are equally likely to be funded.
	<ul style="list-style-type: none"> • Probability of funding success 	Pope & Sydnor (2011)	<u>Prosper (USA)</u> Consumer and personal loans for small business*	Women are more likely to be funded.
	<ul style="list-style-type: none"> • Probability of default 	Lingnan (2019)	<u>RenRenDai (China)</u> Consumer loans	No evidence of gender effect on probability of default.
Age	<ul style="list-style-type: none"> • Probability of funding success; 	Gonzalez & Komarova Loureiro (2014)	Online experiment	Evidence of age bias: young borrowers are less likely to be funded.
Appearance and linguistic	<ul style="list-style-type: none"> • Probability of funding success; • Interest rate; • Probability of default 	Ravina (2008, 2011)	<u>Prosper (USA)</u> Consumer and personal loans for small business*	'Beautiful' (those deemed more physically attractive) borrowers are more likely to have their loans funded and to pay lower interest rates, other things being equal. However, beautiful borrowers are more likely to default on loans.

	<ul style="list-style-type: none"> • Probability of funding success; • Interest rate; • Probability of default 	Duarte, Siegel & Young (2012)	<u>Prosper</u> (USA) Consumer and personal loans for small business*	No evidence of perceived beauty effect. Appearance-based judgments of trustworthiness predict loan outcomes. Borrowers with trustworthy appearance are: <ul style="list-style-type: none"> • more likely to be funded; • more likely to have lower interest rates; • less likely to default on loans.
	<ul style="list-style-type: none"> • Probability of funding success 	Ciuchta & O'Toole (2016)	<u>Prosper</u> (USA) Consumer and personal loans for small business*	Borrowers using positive words in their loan application are more likely to obtain loans; Physical attractiveness influences funding success only when interacted with positive words use.
Education	<ul style="list-style-type: none"> • Interest rate • Probability of default 	Chen, Zhang & Yin (2018)	<u>Paipaidai</u> (China)	Evidence of education premium: Higher education level is associated with lower interest rates and lower probability of default. Male borrowers enjoy higher education premium than female ones.
Social Networks	<ul style="list-style-type: none"> • Probability of funding success; • Interest rate; • Probability of default 	Lin, Prabhala & Viswanathan (2013); Freedman & Jin (2017)	<u>Prosper</u> (USA) Consumer and personal loans for small business*	Online friendships act as signals of credit quality. Borrowers with social ties are consistently: <ul style="list-style-type: none"> • more likely to be funded; • more likely to have lower interest; • less likely to default on loan.

* based on personal credit score

Another important strand of literature looks at efficiency of *information production* by P2P platforms which is the major feature and innovation of P2P lending. Platforms provide different sets of “hard” and “soft” information to individual lenders. As highlighted by Vallée & Zeng (2019) there is a trade-off between the intensity of pre-screening by platform and information provided to investors. Some platforms provide a detailed textual description of loan purpose and rich information on personality of borrower including images (this is the case of the US platform Prosper what explains why its data is often used by the researchers to analyse personal attributes of borrowers). Others, on the contrary, provide less soft information on loans and borrowers and incite lenders to use automatic tools to select loans relying on platform’s pre-screening and risk grades. For instance, in the UK, auto-selection increased from 61% in 2016 to 97% in 2017 (Zhang et al., 2018).

Recent studies suggest that despite the informational asymmetries and the lack of delegated monitor (the role played by financial intermediaries in traditional finance), P2P platforms perform well. Pre-screening by platforms is found to be efficient as risk grades are a good predictor of default on loans (Emekter et al., 2015; Jagtiani & Lemieux, 2019; Faia & Paiella, 2017; Polena & Regner, 2018; Ekpu et al., 2020). Vallée & Zeng (2019), using data from LendingClub (USA), show that platforms dynamically manage adverse selection by controlling the amount of information available to investors (the platform dramatically reduced the number of variables provided to investors in 2014). They find that optimal trade-off consists of intermediate levels of platform pre-screening intensity and provision of information to investors.

P2P platforms embrace opportunities generated by new digital technologies: big data, machine learning, and other artificial intelligence tools reduce screening and monitoring costs. Thus, Jagtiani and Lemieux (2019) report that P2P platforms have been increasingly using alternative data sources and tools to screen borrowers conducting risk assessment so that traditional credit ratings are only a fragment of the available information. The authors compare consumer loan-level data from Lending Club with similar data from traditional bank lending. They find that the correlation between Lending Club's risk grades and the borrowers' FICO scores declined from about 80% for loans initiated in 2007 to 35% for 2014-2015 loans. The findings support the argument that thanks to digital technologies P2P platforms allow borrowers of "low quality" who would have been classified as subprime by traditional banking criteria to be categorised in a lower risk bracket and, thus, secure loan at lower interest rate level. Therefore, P2P lending might increase *financial inclusion*.

One emerging strand of literature is exploring the impact of P2P lending on financial industry as a whole. The major question to be answered is whether P2P lending is a *complement or a substitute to traditional bank lending*. Do P2P platforms attract borrowers who are underserved by banks, who were denied bank credit in the past, or discouraged for different reasons to seek bank loan? Or do they compete with banks for the same clientele? The first evidence from US P2P market confirms the substitution effect (Hayes, 2017; Faia & Paiella, 2017; Tang, 2019). For instance, Tang (2019) shows that P2P consumer lending (Lending Club data) substitutes for consumer bank lending in terms of serving infra-marginal borrowers. He finds that in the counties concerned by exogenous shock on bank supply (e.g. due to the consolidation of assets by banks as a consequence of implementation of the new regulation in 2011 resulting in reduction of lending volume) there was a disproportional increase in P2P loan applications. The author suggests that some borrowers who would otherwise have been served by banks turned to P2P platforms what resulted in a decline of P2P borrowers' quality.

While consumer P2P lending attracted much of attention of researchers, only a handful of studies focused on *small business P2P lending*: this is explained by the relative newness of the phenomenon and consequent data limitations. Mach, Carter & Slattery (2014), examining Lending Club loan book from 2007 to 2012, point out that loan applications for small business purpose were on average less likely to be funded; this was driven primarily by lower quality of such applications. The authors also find that small business loans - when granted - were more likely to perform poorly than other types of loans and were charged a higher interest rate. Interest rates paid by P2P business borrowers were on average two times higher relative to traditional small business loans. Hayes (2017) finds that women owners and/or women managers are far less likely to receive the full amount of loan requested. Nowak, Ross & Yencha (2018) explore the ability of small businesses to signal their creditworthiness to lenders by using loan text descriptions on Lending Club. Their findings show that textual analysis of small business loan descriptions can predict the likelihood of the loan to be

funded and the probability of default. Interestingly, the results are the strongest for lower quality borrowers, i.e. the text is especially relevant for the firms with FICO scores in the lowest quartile (more risky). Thus, the careful write-up of loan request allows firms who would typically be considered as high-risk investment to transmit the signal that “hard” information fails to capture. In the UK, Ekpu et al. (2020) using Funding Circle data find that risk grades are a good predictor of probability of default on loans confirming the efficiency of the model.

Yet little is known about the decision of small firms to seek finance from P2P lending platforms. In the UK, small businesses not only reach for P2P platforms for short term working capital, but increasingly to finance growth (Ekpu et al, 2020). There is a crucial need to explore entrepreneurial cognition to understand what drives this financial decision: is it originated in borrowers’ discouragement in traditional bank loans? First insights are provided by analysis of survey and qualitative data (Pierrakis & Collins, 2013; Baeck, Collins & Zhang, B., 2014). About 60% of businesses who raised money through Funding Circle approached banks before turning to P2P lending. The majority of businesses report that they are likely to access P2P lending in the future; the major advantage that they attribute to such lending relates to the ease of application and the quick decision-making.

Overview and evidence gaps

P2P lending is gaining importance in financial landscape as an alternative to traditional forms of finance. Studies note the benefits of financial innovation are made possible by new digital technologies. Greater transparency and processing of “soft” information so far appear to be efficient. There is a growing body of evidence that P2P perform well in terms pre-screening and attributing risk grades.

To date, the research, driven by the availability of rich datasets, focused mainly on consumer P2P lending. There is a growing evidence on how personal attributes of individuals relate to the probability of successful loan application on P2P platforms, interest rates, and probability of default. However, there is a need for more evidence on antecedents and motivations of P2P borrowers.

First studies cited above suggest that there is a substitution effect between traditional sources of finance and P2P lending. However, as existing research covered mainly the US consumer market, there is a need for further exploration of this topic in other contexts.

There is a lack of evidence on business segment of P2P lending. Further research should examine if P2P lending helps to fill SMEs’ funding gap (Brown & Lee, 2014; Fraser, Bhaumik & Wright, 2015; Wright & Fraser, 2014). What is the place of P2P loans in finance mix of small businesses during their life cycle? There is scope for further research on the ability of P2P lending to help firms grow and achieve entrepreneurial success (Wright et al., 2015; Culkin, Murzacheva & Davis, 2016).

We know little about cognitive aspects that influence the demand for P2P lending. Does it provide a solution for borrowers’ discouragement and reluctance to seek traditional finance? Further studies should also aim to examine the impact of obtaining a P2P loan on subsequent financial attitudes and decision-making.

Finally, the impact of both formal and informal institutional context, of overarching financial infrastructure and of local financial development on the success of P2P platforms should be examined.

Notes

¹ Arguably “marketplace lending” is a more accurate term than “Peer-to-Peer lending” as institutional players, such as British Business Bank, actively lend through P2P platforms (Deloitte, 2016). In 2017, across different models, from 34 to 40% of the P2P lending volume came from institutional investors (Zhang et al., 2017).

² Given that the largest share of P2P business lending in the UK is for real estate mortgage and property development, recent studies consider P2P property lending as a separate P2P model (Zhang et al., 2016, 2018).

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About the author



Dr Anastasia Ri is a Research Fellow at Enterprise Research Centre and Aston Business School. Anastasia holds a PhD in Economics from the University of Nice – Sophia Antipolis (France). Her research interests lie in the fields of small business economics, economic and financial development, investment, efficiency and productivity analysis. She can be contacted at: a.ri@aston.ac.uk

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