

The financial intermediation role of the P2P lending platforms¹

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Forthcoming in Comparative Economic Systems

Abstract

The objective of our paper is to explore the role of P2P lending platforms through the prism of the theory of financial intermediation. P2P lending platforms perform the brokerage function of financial intermediaries by matching lenders' supply and borrowers' demand of funding, according to the risk and the maturity of their needs. Unlike banks, P2P lending platforms do not create money and do not perform risk and maturity transformation. However, they can organize secondary markets to trade loan contracts before maturity and some P2P lending platforms aim at providing a fixed income to lenders. To ensure efficient and sustainable financial intermediation, P2P lending platforms need to ensure that they are not subject to principal-agent problems and that their incentives coincide with those of lenders. The possibility of orderly resolution of P2P lending platforms failures might decrease moral hazard problems that are inherent in the modern financial intermediation.

JEL codes: G21, G23, G01, O33, D40

Keywords: peer-to-peer lending, online lenders, market structure, access to finance, financial crisis, Internet, information and communication technologies

¹ We would like to thank Sebastian Schich for useful discussions on this topic.

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1. Introduction

In 2015, 12% of new small business loans in the UK were originated by P2P lending platforms, becoming a real alternative source of finance in some market segments (Zhang et al., 2015). P2P lending platforms offer credit through Internet, relying on big data and algorithms to assess credit risk and to monitor borrowers. In doing so, they are a part of the wider Fintech movement, defined as the use of technology and of technology-facilitated new business models in the provision of financial services. As incumbent financial institutions suffer from inefficiencies, high leverage, too big to fail problems, opacity and rent-seeking, the entry of Fintech firms may be seen as an opportunity of making financial intermediation more transparent, efficient and stable.

The objective of our paper is to explore the role of P2P lending platforms through the prism of the theory of financial intermediation. A financial intermediary is an economic agent that specializes in the activities of buying and selling financial claims. According to Greenbaum, Boot and Thakor (2015), financial intermediaries perform two functions in the financial system i) a brokerage role and ii) maturity and risk transformation.

A financial intermediary performs the role of a broker when it matches agents with complementary financial needs. Essentially, a broker is a matchmaker that helps to resolve pre-contract and post-contract information asymmetries (i.e. adverse selection and moral hazard). It develops specific skills in interpreting signals on the quality of a financial asset and is able to avoid costly duplication of screening costs by reusing information (both across individuals and time). The brokerage activity includes: transaction services, financial advice, screening and certification of quality (i.e. rating), origination, issuance and funding. A financial intermediary performs also maturity and risk transformation, because it matches liabilities with assets of different duration, sizes, currencies and risks. Banks perform both types of activities (brokerage and asset transformation).

P2P lending platforms represent a new mode of financial intermediation, raising several issues. Do P2P lending platforms perform both functions (brokerage and maturity and risk transformation) in their activity and what is their value added? Are they more efficient than banks in performing some of their traditional functions? Do they use a different matching technology? How do they manage risks and how do they price their services?

Our paper is structured as follows. Section 2 defines the business model of P2P lending platforms. Sections 3 and 4 describe how P2P lending platforms perform two main functions of the financial intermediation activity: the brokerage role and maturity and risk transformation. Section 5 provides some preliminary thoughts about the value added of the P2P lending platforms. Section 6 concludes.

2. The business model of the P2P lending platforms

P2P lending platforms create value by connecting borrowers on one side and lenders on the other side. Unlike a bank where depositors do not have any visibility of how their money is used, a defining feature of P2P platforms is the possibility of retail investors to choose to which borrowers they would like to lend (Figure 1). This decision can be made by analysing risk and return, but also the objective of the project. Indeed many lenders are attracted to this new market because it could give a sense of moral purpose by allowing them to invest in local businesses as well as socially and environmentally responsible projects. Platforms attribute a risk score to every project, but lenders can also analyse financial and non-financial information published online by potential borrowers. As the minimum investment per project starts at 1-20 euros, lenders can diversify their portfolio by investing only in a fraction of every debt contract. Most platforms do not invest in debt contracts that they originate and, hence, they do not take risk onto their balance sheets. Credit risk is borne by lenders. Platforms generate profits from the origination and servicing fees that they charge from borrowers and/or lenders.

Similar to other industries (AirBnb, Uber, payment cards), lending platforms are considered to be a two-sided market. In such markets, a platform creates value by connecting two (or more) distinct groups of users.⁴ It facilitates interactions between them by lowering transaction costs and search costs. In the online lending market, the platform connects borrowers and lenders. A borrower's decision to apply for a loan on a platform depends on how many lenders are willing to lend through this funding channel and on its probability of being funded. Similarly, a lender's decision to fund a loan on a platform depends on how many projects are available and on their expected quality. More generally, there is a positive mutually reinforcing relationship between the number of borrowers and lenders. The number and quality of borrowers that the platform manages to attract has a positive impact on the number of lenders that are willing to invest via the platform. Conversely, the presence of a large volume of funds offered by many lenders has a positive impact on the number of borrowers that seek funding on the platform. Belleflamme et al. (2016) describe in detail all the types of externalities that can be observed in lending platforms (i.e. between lenders and borrowers or between borrowers themselves).⁵ Online lending platforms face similar chicken-and-egg issues as in other platform industries. For example, several platforms had to interrupt accepting funds from lenders because there were not enough borrowers.

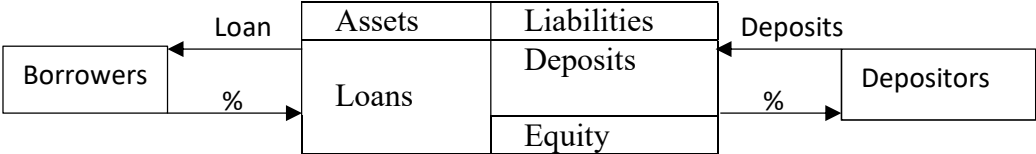
The business model of the P2P platform is applied to a number of distinct specialized lenders. P2P consumer lending platforms offer credit to consumers (Zopa, Ratesetter, Prosper, Lending Club), while P2P business lending platforms originate unsecured and secured debt contracts to SMEs in different industries (e.g. Funding Circle, Geldvoorelkaar, Lendix, Unilend). With time some platforms have started to specialize: some provide property-secured lending to property developers (e.g. LendInvest), while others offer a possibility to SMEs to sell their invoices to investors (e.g. MarketInvoice, Investly) or invest in clean-energy projects (e.g. Abundance, Lendosphere). Several platforms allow businesses to sell debt-based securities (typically a bond or debenture). The main feature of such P2P bond auction platform is a much higher initial required investment, as it is aimed at sophisticated investors.

⁴ According to Einav, Levin and Farronato (2016), peer-to-peer platforms share common elements of market design, including the use of search and matching algorithms, pricing and reputation systems.

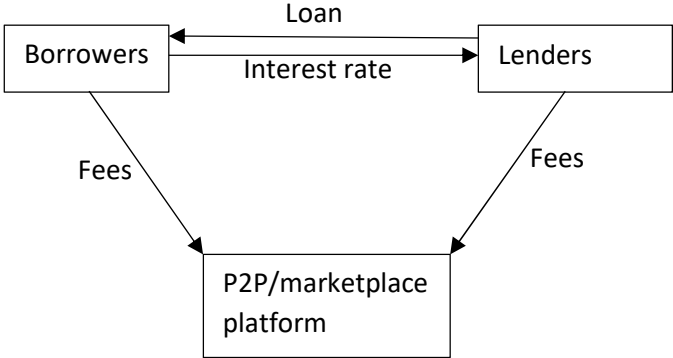
⁵ Depending on the pricing mechanism chosen by the platform, lenders may also exert externalities on each other if they compete to get some funding (which is the case if lenders bid to fund loans in an auction).

Figure 1. P2P/marketplace platforms and banks

Bank



P2P/marketplace platform



3. The brokerage role of P2P lending platforms

P2P lending platforms perform the brokerage function of financial intermediaries by matching lenders’ supply and borrowers’ demand of funding, according to the risk and the maturity of their needs. Similar to other intermediaries, P2P lending platforms help to resolve pre-contract information asymmetries between lenders and borrowers by performing *screening and certification activities*. They have developed an expertise in collecting information and interpreting it to sort borrowers with different credit risks. They also avoid costly duplication of screening costs by lenders by using credit scoring models and algorithms that exploit the reusability of hard information. Acceptance rates differ greatly from one lending platform to another. Most popular platforms reject more than 90% of their applicants at this stage.

Depending on its business model, a P2P lending platform can also engage in other brokerage activities such as *loan origination, issuing of financial claims, funding of loans and provision of financial advice*. Note that a broker could transcend the role of a pure matchmaker by taking on some risks when it buys and resells assets. Kirby and Worner (2014) distinguish three business models of P2P lending platforms. First, in the ‘client-segregated account model’, platforms are a mere window for loans. The clients’ money is placed into a bank account separate from that of the platform, over which the platform has no right (Zopa and Funding Circle in the UK). In the ‘notary model’, once the funding goal is met, the bank originates the loan and the platform issues a note to the lender that reflects the amount of money that has been invested. The borrower repays the note to the bank, which transfers funds to the platform. The latter ultimately pays the lenders (Prosper and Lending Club in the US). Finally, in the guaranteed-return model, the platform matches lenders and borrowers, defines the terms and conditions for the loan, issues the loan directly, manages the investments of borrowers and repayments of lenders and sets a guaranteed return rate for borrowers (CreditEase in China). It

should be noted that in all those three business models, unlike banks that create money when they provide loans, P2P lending platforms do not perform the function of money creation.

The screening processes used by P2P lending platforms

Incumbent banks possess an informational advantage over any new entrants because they have access to a lot of private hard and soft data on credit history and current accounts of their borrowers.⁶ In countries that have credit information sharing schemes (credit registries or credit bureaus), P2P lending platforms are mostly given access to credit histories of their potential borrowers (FICO score in the US, FIBEN in France, credit reference agencies in the UK). However, such data is often incomplete (missing variables and short history) and is not as good as banks' private data.

To overcome these informational asymmetries, P2P lending platforms have to use different information sources and screening processes than banks. When their activity was launched, P2P/marketplace platforms relied a lot on the 'wisdom of crowds' to produce information. Depending on their private information on borrowers' credit risk, lenders could decide on whether or not to lend and at what interest rate. This 'wisdom of crowds' could reflect soft information that lenders might have about borrowers due to geographic proximity, personal ties and knowledge about a particular economic industry.

As the online credit market matured, the importance of the 'wisdom of crowds' has diminished and platforms are developing their own scoring models by using new digital sources of information. Banks collect transactional data from current accounts that help them screen borrowers. Such transactional data is becoming increasingly available online because SMEs use digital solutions to manage their payments, invoicing or accounting activities. For example, historical personalized transactional level data is being aggregated by business and financial software companies that offer account aggregation service (Yodlee), payment (Stripe), invoicing, accounting (QuickBooks, Xero, Sage, Opera 3, TASBooks) and other services for small businesses (Nash and Beardsley, 2015). The regulatory approach of 'open banking' could further decrease incumbents' informational advantage.

Finally, alternative online lenders may use big data and algorithms to screen borrowers. Indeed, using very large sets of data to create credit algorithms has become possible due to open-source big data software platforms like Spark and Hadoop. Some P2P lending platforms claim to use machine-learning technologies to improve the credit assessment process. Yet, information about scoring models is proprietary and little is known about the data input, specification and methodology.

Some P2P lending platforms attempt to use big data provided by social media (e.g., in the U.S Amazon, eBay and other e-commerce sites). For example, a small business that draws negative reviews on eBay also could undermine its chances of getting more credit. Facebook, Twitter and LinkedIn are also taken into account to assess "online reputation". For consumer loans, number and nature of LinkedIn connections to co-workers and to potential employers allows to predict the probability of quickly finding a job and, hence, credit default. Applicants with a Facebook friend who has defaulted might be more likely to be rejected. One start-up asks

⁶ Numerous studies document that account activity (credit line usage, limit violations, and cash inflows) substantially improves default predictions and are especially helpful for monitoring small businesses (Norden and Weber, 2010; Mester, Nakamura, and Renault, 2007).

Facebook friends to vouch for borrowers and, to verify if they are real friends, it checks messages for shared slang or wording that suggests affinity.

Pricing online loans

How do platforms price loans and what is the impact of the pricing mechanism on credit availability and risks? Platforms use mainly two pricing mechanisms: i) centralized control of loan prices (e.g., Lending Club, Prosper after December 2010), or ii) auctions (e.g., Unilend, Prosper before December 2010).⁷ The choice of a pricing mechanism responds to several objectives and constraints. Platforms need to find an efficient technology to match lenders and borrowers, thereby reducing search costs, ensure that prices convey information on risks and earn some profits. It is interesting to note that the auction mechanism is gradually disappearing from the market. As shown by Einav et al. (2015), this trend is common to several online markets. This is because sellers' revenues from using an auction decrease as competition becomes more intense and buyers' interests in participating to auctions declines. In the case of P2P lending markets, the sellers are the borrowers offering loans as securities, whereas the buyers are the lenders who invest in loans. It can be also argued that the choice of a centralized mechanism can change the way platforms compete with banks and other financial institutions. Indeed, in a centralized mechanism, platforms compete in prices and investors lose all their bargaining power as regards to pricing. In an auction mechanism, investors compete to fund loans.

If the platform controls directly loan prices, it assigns to each borrower a credit grade, which depends on the borrower's credit score. Based on this grade, the borrower can choose within a set of loan contracts that differ in maturity, interest rate and origination fee. Once the borrower has chosen how much to borrow, the amount is listed on the platform's website with additional information on the company. Lenders decide on how much to invest in a given loan. If the amount requested by the borrower is reached, the loan is issued and the borrower makes monthly repayments.

In the auction mechanism, the platform also assigns to each borrower a credit grade, but it allows borrowers to post prices and lenders compete by posting bids. For example, during the auction mechanism at Unilend, a French P2P lending platform, every lender can choose an interest rate and an amount which he/she would like to lend. At the end of the fundraising campaign, the lowest interest rates are retained, and an SME then reimburses each individual lender at its own interest rate. If the borrowed amount is raised before the end of the bidding period, the borrower has the right to stop the auction. Alternatively, the borrower can allow lenders continue bidding in the hope to lower the interest rate. Consequently, this scheme of lending induces a certain degree of competition between individual lenders.

The platform's choice of a pricing mechanism impacts default rates, borrowers' probability of getting funded and loan maturity choices. Wei and Lin (2015) show that a change from the auction to the posted-prices mechanism on Prosper.com increased the interest rates, the probability of getting a loan and the probability of default. Rahim (2016) estimates how a

⁷ It is interesting to draw a parallel with trading mechanisms for securities. There are mainly two categories of trading mechanisms: quote driven and order driven. In quote-driven markets, market makers compete by posting prices at which they commit to buy and sell a given security. Buyers and sellers trade with the market maker who makes a profit from the difference between the bid price and the ask price. In order-driven markets, buy and sell orders interact directly and the price adjust according to the ratio of buy and sell orders. Stock exchanges obtain revenues from: transaction fees, trading data sales and listing fees.

change in the pricing mechanism impacts the demand and the repayment behavior of borrowers. He shows that when the platform sets prices instead of using an auction, borrowers are more likely to switch to longer maturity loans, borrow larger amounts and make higher repayments.

Recovering losses

P2P lending platforms also engage in some *ex-post monitoring* activities after the loan has been issued to reduce moral hazard, in particular in the case of loan non-repayment. Due to consumer protection laws, lenders have no right to contact borrowers directly in case of default. Similar to bonds, loans originated via a platform are dispersed across many investors, which could complicate intervention and renegotiation of capital structures. To lower these costs, platforms promise to make their best efforts on behalf of lenders to recover the unpaid balance from delinquent borrowers. Platforms are supposed to work with borrowers to arrange for an immediate payment, structure a new payment plan, contact external collection agencies or take other appropriate action to recover a loan. When platforms have access to credit registries and bureaus, they also report delinquent borrowers to them.

Unlike traditional banks that rely mostly on collateral to lower losses in case of borrower default, online lenders differ with respect to their use of collateral. They appear to be more willing to lend to creditworthy businesses with few physical assets (e.g. a web design company or a legal practice). In some cases, the security takes form of debentures and personal guarantees from the director of the company. In the event of default, using the debenture or personal guarantee could include taking control of the business or putting it into administration. As the P2P lending market matures, more and more online lenders require some borrowers to provide physical security (cars, residential properties, or financial assets, credit insurance) against their loans. In particular, the rapid development of P2P platforms for property developers has been facilitated by the use of property as collateral. If a borrower were to default, the platform would use the security to recover the outstanding debt and to reimburse the lender.

4. Towards maturity and risk transformation?

Apart from producing information and monitoring borrowers, the second fundamental function of financial intermediaries is maturity and risk transformation (Diamond, 1984; Diamond and Dybvig, 1983). Banks' existence is justified by their role in maturity and risk transformation as they collect risk-free sight-deposits and invest them into long-term risky loans. Despite the benefits of such transformation for the society, it is also this feature that renders even solvent banks fragile to bank runs and panics, which justifies banking regulation and depositor guarantee scheme.

4.1 Secondary markets

Although P2P/marketplace platforms do not provide maturity transformation, a growing number of platforms organize secondary markets allowing lenders to sell their loans or debt securities. In more mature platforms, buyers and sellers can post their prices online and the deal is settled more or less automatically if the demand and supply meet. Selling a loan could be done with a premium or a discount, depending on the supply and demand, but defaulted loans cannot be sold. A sale fee is charged by some platforms. Unlike banks, withdrawing funds from P2P/marketplace platforms is not guaranteed and is done only as long as there are interested buyers. It is difficult to evaluate the liquidity of the current secondary markets because

platforms do not publish turnover statistics. In the long run, blockchain technology could provide the necessary infrastructure for an efficient and secure secondary market.

4.2 Strategies to manage credit risk

Although P2P lending platforms do not perform risk transformation, they propose two main strategies to reduce risk incurred by lenders: (1) diversification through automatic investment and (2) provision funds.

Diversification through automatic investing

A first strategy to manage credit risk is the use of diversification through automatic investing. The minimum amount that can be invested in each business is small on all P2P/marketplace platforms, ranging from 1 to 20 €/\$/£, allowing lenders to diversify their investment. Nevertheless, the number of potential borrowers varies significantly between platforms: from a few dozen of borrowers on young platforms to many thousands on more established platforms. The largest P2P business lending platform at the end of 2016 was Funding Circle and it has lent to almost 20 thousand of SMEs worldwide. Very few P2P platforms can provide such diversification benefits to lenders. As P2P lending markets remain national, with few possibilities to lend across borders, investors in countries with young markets are confronted with the situation that there are only few new potential borrowers available at any point of time.

However, diversifying their loan portfolio among different borrowers could be extremely costly for individual retail lenders, as this would require analyzing hard and soft information about all potential borrowers. As number of borrowers on P2P/marketplace platforms increases, automatic investment - where a lender could set lending criteria automatically – becomes a standard feature. These criteria are set individually by each platform and could include risk band, maturity, interest rate, loan-to-value ratio, maximum investment in one loan, location, etc. Automatic investment could be also useful for diversifying between new and existing loans, if a platform offers a secondary market. Some online platforms go a step further by pooling all loans together and by offering a lender an opportunity to spread their funds across the entire loan book. Importantly, such automatic investment resolves the problem of duplication costs in the collection of information but it reduces lenders' incentives to collect and analyze information.

The design of provision funds

A second strategy, used by several P2P lending platforms to reduce risks, is the design of provision funds. When a borrower defaults on its loan originated via the P2P platform, the loss is supposed to be borne directly by the lender. However, several platforms have created provision funds that could cover losses if borrowers are late on their interest payment or principal.⁸ The objective of the provision fund is to ensure that lenders are reimbursed completely (principal and interest rate) by absorbing expected losses. It is funded by a risk-weighted contribution paid by borrowers and/or by the cash provided by the platform itself. The capacity of the provision fund to absorb losses is measured by the Provision Fund Coverage Ratio, calculated by dividing the size of the Provision Fund by Expected Losses. A 100% Coverage Ratio suggests that the

⁸ Ratesetter in the UK introduced the first provision fund. Nowadays, most platforms in the UK use them except for Funding Circle. The most important exception to the rule is Funding Circle, the largest SME platform.

Provision Fund should be able to cover all expected claims. Expected losses are calculated by relying on proprietary internal models and some platforms report expected losses estimated for the scenarios based upon the stress test assumptions of the regulators.

While the use of the provision fund appears to be automatic on some platforms (e.g. Ratesetter, Prexem), it is mostly discretionary on other P2P platforms (e.g. Assetz Capital). The platforms specify that the decision will be taken on a case-by-case basis depending on the circumstances, but as most platforms are too young, it is too early to have information about the exact decision-making process. Importantly, these P2P lending platforms do not represent a guaranteed-return business model. If losses are greater than the provision fund, they will be borne by lenders. Several platforms reserve the right to call a resolution event that mutualizes everyone's investments and pays out on a pro-rata basis. This means that even if the lender has not suffered any losses directly, he/she will experience losses because of high overall losses on the platform. While this procedure has not been used yet, it could be triggered during a downturn.

5. The value added of the P2P lending platforms

Given the above differences between banks and lending platforms, what is their value added? Are P2P lending platforms more cost-efficient and have better screening models than traditional banks? What funding gap do they fill? How to limit agency costs inherent in the financial intermediation? Could P2P lending platforms enhance financial stability?

Cost-efficiency

Philippon (2016) and Bazot (2013) demonstrate that the unit costs of financial intermediation⁹ have remained at 2% since the end of the 19th century. Despite an impressive progress in the communication and information technologies (telephone, computer and internet), banks have not lowered the costs of financial intermediation, which might be reflected in higher prices for the end-users. In this context, one could hope that P2P lending platforms could be more cost-efficient than traditional banks because they do not have brick-and-mortar branches and automate the screening process as much as possible. At this stage, it is too early to compare cost-efficiency of banks and P2P lending platforms, because few P2P lending platforms have achieved scale efficiency and profitability. Moreover, banks rely on cross-subsidization strategies, which renders comparison of costs for each product difficult.

Filling the funding gap

P2P lending platforms appear to fill the funding gap left by traditional banks in the wake of the crisis. Studying consumer credit market in US counties, Havrylchuk et. al (2017) find that the development of P2P lending was higher in counties with overleveraged banks and low penetration of bank branches. Koetter and Blaseg (2015) show that bank instability in Germany has pushed businesses to use equity crowdfunding as a source of external finance. Survey evidence for the US and UK suggests that online finance is used by smaller, younger, and less profitable firms that do not have collateral (Wiersch et. al. 2016; Pierrakis and Collins, 2013).

⁹ Unit cost of intermediation is obtained by dividing the income of the finance industry divided by the quantity of intermediated assets.

These firms experience more difficulty in obtaining a loan than larger firms, which is manifested by a higher number of loan applications and rejections.

Comparison of the screening process used by P2P lending platforms and banks

Since P2P lending platforms have entered the markets with the highest informational asymmetries (SMEs and consumer credit without collateral), an important issue is whether they have appropriate tools to screen borrowers. Do they have better scoring models than incumbent banks in order to overcome informational asymmetries in these markets? On the one hand, online lending platforms could be faster to adopt new data, algorithms and machine learning technologies for internal credit scoring, while hierarchical structures and inherited information technologies might hinder banks to adapt as quickly. On the other hand, banks have more data on credit history and current accounts of their borrowers. Credit scores are not comparable across different platforms and banks because algorithms used by online lenders are proprietary and have not been tested during an economic downturn.

Furthermore, the digitalization of the screening process entails several limits. First, P2P lenders need to perform the costly verification of the data submitted by borrowers. Currently, it is impossible to automate the whole selection process, since a lot of information cannot be provided in an electronic form. In many countries, information on legal proceedings, civil judgments, collateral registry, and fiscal information is not available in digital format for an easy and fast access for creditors. Digitalization of such information could be helpful for all lenders, unless they express a concern for privacy. Second, privacy laws and regulation could limit the use of the data offered by social media.¹⁰

In addition to potential advantages in using hard data, there is some evidence that P2P/marketplace lending platforms generate value by harnessing the wisdom of crowds. Platforms allow harnessing the benefits of social ties. Freedman and Jin (2014) document that endorsement and bids on the friends' applications yield higher returns to lenders. Loans funded by investor groups perform better if someone in the group is personally connected to borrowers (Everett, 2010). More generally, there is evidence that credit quality of one's friends is an informative signal of borrower quality (Lin, Prabhala, and Viswanathan, 2013). When a borrower friend defaults, the likelihood that the borrower will default more than doubles (Lu, Gu, Ye, and Sheng, 2012). While information on personal connections appears to be useful for screening borrowers, it can also be easily manipulated and gamed. Freedman and Jin (2014) show that friends learn to bid on each other's applications to increase their chances of being funded.

Importantly, not all soft information is lost, when a loan is granted on a platform. Despite the lack of relationships between lenders and borrowers, the personality of the borrower can be perceived via the text that he/she decides to provide on the platform. Researchers have attempted to test if these narratives allow extracting a signal about borrower credit-worthiness. By analyzing the linguistic content of these narratives, Herzenstein et al. (2011) have found that trustworthy and successful identity claims increase funding and improve funding terms, but have no impact on loan performance. Gao and Lin (2012) find that borrowers that post narratives that are easy to read exhibit lower default rates than borrowers with complex narratives. This type of evidence is interesting in two respects. First, it suggests that some soft

¹⁰ Schufa, a German credit bureau, has also abandoned plans to mine Facebook, Twitter and LinkedIn after a public backlash (The Economist, 2013).

information could be “hardened” and used a signal of credit-worthiness in the automated screening process. Second, it shows the limits of soft information inasmuch as it is subjective.

The ‘wisdom of crowds’ is further undermined by their use of subjective photo information, leading to discrimination. Ravina (2016) documents an irrational bias of lenders towards attractive photographs. Borrowers that are perceived to be beautiful are more likely to be granted a loan and to pay a lower interest rate. Such discrimination is taste-based, as the default rate of such borrowers is higher. Pope and Sydnor (2011) document discrimination against racial minorities, but they conclude that this discrimination is statistical in nature because their default rate is also higher. Importantly, even if such statistical discrimination could enable the extraction a signal about the credit-worthiness of borrowers, its use is illegal.

While the literature on the ‘wisdom of crowds’ brings a lot of insights into the behavior of individual lenders, it concerns mostly first years of P2P lending development, when the amount of lending was small and pricing was done with the auction method. As P2P lending platforms go mainstream and lenders rely on automatic investing, the value of ‘wisdom of crowds’ diminishes.

Principal-agent problems

Since lenders have “skin in the game”, they may have incentives to pay the cost to overcome information frictions (Morse, 2015). However, if lenders want to reduce their transaction and screening costs, they delegate these tasks to P2P lending platforms. A literature on the delegated portfolio management shows that it is difficult for the principal to write incentive compatible contracts (Stracca, 2005). Assuming that online lenders have a comparative advantage with respect to banks in using algorithms and big data to screen and monitor borrowers, it is still important to ensure that they have the right incentives to act in the interest of lenders and are not subject to principal-agent problems. In particular, what is the reliability of information published by P2P/marketplace platforms (i.e. credit risk scores)? How can lenders ensure that the platform does its best to “monitor” the borrower and to conduct costly debt recovery on their account? Indeed, lenders also incur some costs of monitoring the platform, that is, they need to monitor the monitor. Platform can design strategies and contracts that reduce the lenders’ monitoring costs and the theory of financial intermediation provides a few solutions.

A first solution for the platform is to take some skin in the game by investing in the loans it issues. Leland and Pyle (1977) were first to show that an intermediary could credibly signal the quality of its information by investing its wealth in assets about which it claims to have produced valuable information. The global financial crisis has revealed the agency problems that are inherent in business models of financial intermediaries that have no skin in the game. In particular, loan securitization has lowered the incentives of banks to screen borrowers (Keys et al., 2010). In light of this, most platform founders claim to invest money in loans issued by their platforms. However, this mechanism is informal and temporary. Several platforms have adopted a hybrid business model and lend at least a part of their own money to borrowers, thus signaling their “skin in the game” and confidence in their own risk scoring (i.e. Lendix).

A second solution is to design contracts with investors that reduce their monitoring costs. Diamond (1984) offers a solution to the problem of “who monitors the monitor” and provides an explanation for the existence of a bank. The fundamental feature of this model is the existence of risk transformation and a fixed term deposit contract. Depositors to the intermediary can reduce monitoring costs if the costs of monitoring the intermediary are lower

than the costs of lenders lending directly to borrowers and directly incurring the monitoring costs. This is possible if depositors decide to audit a bank only when it does not respect a payment of a fixed interest rate to them. If an intermediary is large, the cost of auditing for depositors goes down because diversification ensures that the intermediary can commit to a fixed payment to depositors that can only be honored if, in fact, the intermediary has monitored borrowers as it promised.

In light of this, a standard P2P platform does not solve the problem of “who monitors the monitor” because it does not commit to pay a fixed interest rate to lenders. Since lenders absorb the losses, they need to audit the platform every time when a loan is not reimbursed. This amplifies monitoring costs. One might assume that lenders decide to “audit” a platform only when the return falls below some predefined threshold. In this case, the lower the volatility of return, the lower the monitoring costs for lenders. A possible solution could be provided by the guaranteed-return business model. For example, Ratesetter, a UK consumer and business platform, aims to provide a fixed return to its lenders (relying on the diversification and provisioning), although it declares that investors’ capital is at risk. As long as lenders do not suffer any losses, they do not need to audit this platform, solving the problem of “who monitors the monitor”.

The compensation structure could also influence incentives of financial intermediaries to screen risk. In particular, empirical evidence shows that compensation linked to the volume of originated loans reduces risk screening and increases risk taking (Berg et al., 2015). Most platforms charge an origination fee (in % of the granted loan) at the time of loan origination and a servicing fee (in % of capital due) that is paid during loan reimbursement. If a loan defaults, P2P lending platforms do not perceive servicing fees, which impact their profits. In addition, some P2P lending platforms charge borrowers a collection fee in percent of the amount recovered in the case of no litigation, or in percent of hourly attorneys’ fees if litigation is involved. To align incentives of lenders and platforms, it is important to ensure that P2P lending platforms’ profitability depends more on the loan performance (servicing fee) and less on the volume of originated loans (origination fee). Finally, platform incentives for lenders also matter. When platforms offer an origination reward to group leaders, this incentivizes them to bid for riskier borrowers (Hildebrand et al., 2016).

Financial stability

To understand how P2P lending platforms would behave during a financing crisis, it is important to distinguish between self-fulfilling banking panics and a fundamental banking crisis. In a fractional banking system, banks are involved in maturity transformation and even solvent banks are fragile to self-fulfilling panics. If a depositor thinks that the bank is solvent but that other depositors are going to withdraw money from a bank, the only rational decision for this depositor is to withdraw money before other depositors. To meet the demand of depositors, a bank would be required to “fire sell” its assets at a price below the market, leading to bank’s insolvency.

The modern solution to avoid such bad equilibrium consists of deposit insurance schemes. Since depositors know that their deposits are insured by the state, they have no incentives to withdraw their money. Financial theory provides two more solutions to avoid self-fulfilling bank runs: limited convertibility of deposits and equity financing of banks (Freixas and Rochet, 2008). A limited convertibility of deposits requires a bank to reimburse a limited number of deposits, but without resorting to “fire sales”. Hence, if a depositor thinks that the bank is solvent, he/she has

no incentives to withdraw their deposits before other depositors. Secondary markets of P2P lending platforms provide a similar mechanism to avoid self-fulfilling panics, because the only rational decision for a lender who does not experience a liquidity shock is to keep his/her money invested via the platform. Such unique equilibrium is explained by the fact that the lenders' return does not depend on the decision of other lenders to keep or sell their loans. As some platforms charge a sale fee, the return could be even reduced if a lender decides to sell a loan on the secondary market before loan maturity.

Hence, in light of the above discussion, one can conclude that P2P lending platforms could provide liquidity to investors, but unlike banks, they are not fragile to self-fulfilling panics à la Diamond and Dybvig (1983). However, this does not prevent platform failure due to bad fundamentals, such as poor credit scoring, high costs, as well as low net return. Moreover, if lenders' risk aversion goes up, they might decide to withdraw money from platforms. Importantly, if a platform fails, the return of lenders should not be affected by this failure because it depends only on borrowers' reimbursements. Regulators in some countries (e.g., in the UK) require platforms to make a contract with a third party to ensure that lenders continue to be reimbursed even in the case of the platform failure.

The resolution of a P2P lending platform could be much more orderly than the resolution of a bank. The orderly resolution of a bank is notoriously difficult, because its balance sheet is like a black box and investors might disagree on who has to bear losses. By directly linking lenders and borrowers, P2P lending platforms provide a built-in bail-in mechanism. Finally, the possibility of such orderly resolution together with the absence of the deposit insurance might decrease moral hazard problems that are inherent in the modern financial intermediation due to government guarantees.

6. Conclusions

P2P lending platforms perform the brokerage function of financial intermediaries by matching lenders' supply and borrowers' demand of funding, according to the risk and the maturity of their needs. The main problem of this new form of financial intermediation is solving adverse selection problems by relying on new scoring models. Although banks have better access to information because of their access to the credit history and current account data on borrowers, P2P lending platforms can experiment with new sources of data and machine learning. Unlike banks, platforms do not transform maturity and risks. However, they have built a range of different strategies to reduce risks: secondary markets, diversification via the automatic investing as well as provision funds.

P2P lending platforms have created a new business model that is not vulnerable to self-fulfilling panics à la Diamond and Dybvig (1983). However, lenders delegate to platforms the selection and monitoring of borrowers, which might be a source of moral hazard problems because most losses are borne by lenders. Platforms have to demonstrate that they act in the interest of lenders. An absence of government guarantees and a possibility of an orderly resolution of platforms could diminish these moral hazard problems.

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