



Repayment behavior in peer-to-peer microfinancing: Empirical evidence from Kiva



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ABSTRACT

Based on a sample of microloans (to individuals and to groups) that were refinanced through the peer-to-peer microfinancing platform Kiva, we study the determinants of the repayment behavior of micro-entrepreneurs whose loans are available to international charitable lenders. We perform binary regressions and account for influential factors such as the time required for funding or the type of entrepreneurial activity. The screening and monitoring quality of the microfinance institution which selects the borrowers is a main driver of credit default. We find evidence that the loan size, the loan term and the length of a possible grace period influence the probability of default. Moreover, women demonstrate better repayment behavior which is, however, not the case for groups of women.

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1. Introduction

In recent years, microfinance has been growing rapidly with more than 195 million clients having received microloans from microfinance institutions (MFIs) by the end of 2011 (Reed, 2013). The MFIs refinance the loans they grant partly through deposits and partly through international investors who provide capital through indirect or direct investments. The rising interest of socially oriented investors in contributing to microfinance development is recognized by several online microfinancing platforms, such as Deki, Babyloan, Rang De and Kiva. The most popular of these platforms is Kiva, which enables individual lenders to fund microloans to poor entrepreneurs around the world without receiving interest but, at the same time, fully bearing the credit risk. Lenders donate their interest in the sense of charitable giving. However, microfinancing via Kiva is beyond charitable giving as lenders are able to use the same funds after loan repayment to empower several low-income borrowers. In contrast to conventional P2P platforms, Kiva builds on the financial intermediation performed by the participating MFIs which select and monitor the borrowers. MFIs seek to appeal to investors in order to receive microloan-related refinancing on Kiva.

The aim of this study is to identify the determinants of the repayment behavior on Kiva which is crucial for investors who cannot compensate losses through a risk-adjusted interest rate. To this end, we investigate the influence of several variables such as loan

characteristics on the default probability of a microloan refinanced by individual lenders on Kiva. As Kiva selects the loans with respect to their attractiveness to international investors, the default drivers may be different to those known from other studies. Furthermore, we investigate the impact of the MFIs' screening and monitoring abilities on the default probability. By identifying the credit risk drivers of Kiva loans we can also address the question of financial motives (here minimization of losses) versus social ones in the investment decision of the charitable lenders by utilizing the time to complete funding as a measure of a loan's attractiveness.

Kiva has been of academic interest in recent years. Its ideology has been studied by Bajde (2013), the competition faced by the MFIs on the platform has been considered by Ly and Mason (2012) and Kiva's impact on poverty alleviation has been discussed by Schwittay (2014). While the decision making process of the lenders with respect to the entrepreneurial narrative representing a microborrower's profile, social distance, motivation and transaction costs are addressed by Burtch, Ghose, and Wattal (2014), Liu, Chen, Chen, Mei, and Salib (2012), Galak, Small, and Stephen (2011) and Meer and Rigbi (2013), little is known about the repayment behavior on Kiva. Only Jenq, Pan, and Theseira (2015), who focus on the impact of the borrowers' appearance on the funding behavior of lenders, consider the impact of these characteristics (and some controls) on credit default as a peripheral aspect. Due to their rather small sample and their different focus, they only find the loan term and the loan amount to be significant credit risk drivers.

Information asymmetry is known to be a main challenge in microfinance when it comes to repayment behavior. Credit default and innovative means to overcome this problem are explored by several

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theoretical studies of Ghatak (1999), Stiglitz (1990), Besley and Coate (1995) and Armendáriz de Aghion and Morduch (2000). In classical microcredit literature, the influence of variables such as group lending, loan conditions or gender on the repayment have been studied by Giné, Jakiela, Karlan, and Morduch (2010), Godquin (2004), Field, Pande, Papp, and Rigol (2013), D'Espallier, Guérin, and Mersland (2011).

Review papers on commercial P2P lending demonstrate the academic interest in online P2P lending platforms (Gonzalez & McAleer, 2011; Bachmann et al., 2011). Credit default on commercial P2P lending platforms is studied in terms of, for instance, financial intermediation, herding behavior, social networks and personal characteristics of the borrowers (Berger & Gleisner, 2009; Herzenstein, Dholakia, & Andrews, 2011; Lin, Prabhala, & Viswanathan, 2013; Pope & Sydnor, 2011).

In this study we connect aspects of classical microfinance and crowdfunding, as we are interested in the determinants that play a role in the repayment by borrowers on microfinancing platforms. Thereby, we contribute to the literature analyzing credit risk aspects in microfinance. As Kiva is a microfinance platform, which actually aims at refinancing MFIs through philanthropic investors, our findings are very important for exactly these two groups of microfinance actors.

We focus on researching the influence of the funding behavior, the financial intermediary, the borrower's gender and the credit conditions on the repayment behavior. We investigate the impact on the repayment behavior of individual borrowers and of groups of borrowers by conducting several binary regressions. Kiva connects social investors from developed countries with low-income borrowers from developing countries based on the *indirect model* which contrasts with classical P2P lending. Kiva works with local partner MFIs which screen potential microfinance borrowers and submit internet profiles representing entrepreneurial and personal characteristics and the contractual conditions with Kiva. Potential lenders from all over the world can browse the borrowers' internet profile and lend to individual borrowers or groups of borrowers. Usually, all loan requests are fully funded and Kiva transfers the money to the MFI that is in charge of the loan. In less than 1% of all cases Kiva has to refund loans to lenders which is mainly due to a violation of Kiva's policy and occasionally due to incomplete funding. MFIs acting as local financial intermediaries are responsible for selecting the borrowers. According to Allison, McKenny, and Short (2013), Kiva explicitly requires their partner MFIs to focus on social impact and to select rather poor borrowers, who are in urgent need of funding. Besides meeting this condition, MFIs have an incentive to select creditworthy borrowers in order to repeatedly attract potential lenders to fund their loans because lenders may consider the MFI's overall repayment reputation in their lending decision. From this perspective, it is rational to present the most reliable borrowers in terms of repayment on Kiva in order to ensure a good reputation and a quick funding. As Kiva explicitly recommends lenders to use repaid loans to lend again, the repayment of loans becomes valuable to charitable lenders in terms of supporting several low-income borrowers in the long run. The loan does not yield interest for the lenders. Therefore, lenders are not able to compensate for a potential default through a higher interest rate, making research on the determinants of credit default even more valuable.

To date (Dec/05/2015), the total amount lent through Kiva is more than 787 million US dollars to more than 1.8 million microfinance borrowers. Our empirical analysis is based on a randomized sample representing 29,304 transactions on Kiva between February 2011 and October 2013. The data sample exclusively includes closed, i.e. matured, loans that are successfully repaid or defaulted upon. The overall repayment rate is 98.78%.

Our research yields some interesting findings. We find evidence to support the fact that MFIs with fewer loan defaults in the previous period are also able to limit the credit risk of their new loans, emphasizing the importance of adequately selecting and highly monitoring the

borrowers. Furthermore, loan conditions such as the loan size and term play a significant role in the repayment. Women also appear to make a more ambitious effort to repay loans than men, while group loans are more risky up to a size of seven members.

An analysis of the funding time which proxies the attractiveness of the loan applications to the social investors, yields deeper insights into the motives of the lenders. The first important finding is that lenders indeed do care about the credit risk of a loan which shows that they have financial motives even though they abstain from receiving interest payments. However, also variables indicating a social purpose such as loans to groups of women, can also make a loan attractive even if the credit risk is increased by this purpose. Altogether the funding time is not a significant determinant of the creditworthiness of borrowers.

The remainder of this article is organized as follows. In Section 2 we develop the hypotheses from the findings of previous research. After describing the data set and methodology in Section 3, Section 4 represents the results of the probit regression models. Section 5 discusses several robustness checks that were carried out. Section 6 concludes with possible implications for P2P microfinancing and future research.

2. Theoretical background and hypotheses

2.1. Information asymmetry in the microcredit market

Risk of uncertainty due to information asymmetry in credit markets has been widely researched (e.g. Hoff & Stiglitz, 1990; Sufi, 2007). Yum, Lee, and Chae (2012) state that the information asymmetry problem exists to a larger extent in the (online) P2P microcredit markets as private lenders lack information on microfinance borrowers and on the MFIs which act as financial intermediaries. Additionally, the majority of private lenders are non-professional investors and thus not experienced in assessing creditworthiness (Yum et al., 2012). Private lenders are unable to monitor and impose social sanctions against borrowers in the case of bad repayment performance which increases the repayment risk (Herzenstein et al., 2011). Not only the lenders but also the MFIs themselves face the problem of imperfect information and imperfect enforcement. The severity of information asymmetry and the lack of effective loan enforcement cause adverse selection problems and moral hazard risk. Additionally, the missing collateral reinforces moral hazard behavior. MFIs have the possibility of employing indirect or direct mechanisms to obtain information on the characteristics and actions of borrowers to ensure loan repayment. The contract itself can serve as an indirect mechanism. MFIs are able to obtain information on the borrower's riskiness and actions by requiring an appropriate interest rate, using reputation effects and interlinking loan contracts with other transactions in related markets (Hoff & Stiglitz, 1990; Stiglitz & Weiss, 1983). Therefore, a direct mechanism is established as lenders are able to select and monitor clients based on additional information obtained by market participation and communication (Siamwalla et al., 1990). Moreover, MFIs rely on the direct screening and monitoring of borrowers to prevent adverse selection, to support a borrower's success and to inhibit strategic defaults. The direct screening and monitoring process is quite often costly and difficult. Geography and the kinship group have revealed themselves to be crucial in successful monitoring and loan enforcement as living near each other provides a source of information and enforcement mechanisms such as social sanctions. In the past, local moneylenders, for instance, were more likely to grant unsecured loans more successfully than financial institutions without access to local information on borrowers (Hoff & Stiglitz, 1990; Stiglitz, 1990). Thus, the main challenges for MFIs are obtaining information on the riskiness of borrowers, creating incentives for borrowers to exert efforts to succeed and enforcing repayment to limit the probability of default.

To conclude, indirect and direct mechanisms are used by MFIs to resolve the three main problems which are endemic to the credit market in developing countries. The MFI's resources to screen and

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