MONITORING REPAYMENT IN ONLINE PEER-TO-PEER LENDING.

Craig McIntosh[1]
IRPS/UCSD

March 2011

Abstract.
Recent years have seen an explosion in the use of Peer-to-Peer (P2P) lending, in which websites such as Kiva and Microplace offer individuals the ability to make loans to microfinance borrowers across the developing world. Such sites offer a fascinating new example of a two-tiered monitoring device in which micro-finance institutions (MFIs) maintain dynamic relationships with borrowers and P2P lenders maintain dynamic relationships with MFIs. This chapter examines the credibility issues that arise in this new network of NGOs, linking individuals across countries in the absence of any public regulator. The P2P microfinance lending system is a successful example of an NGO creating a robust set of private standards to which other NGOs voluntarily subject themselves, but complex questions remain as to the causal claims that can be made by these institutions on humanitarian grounds, and how the public should evaluate their credibility.

[1] The author is grateful to Bryan Diaz and Summer Starr for their excellent research assistance on this project.

I. Introduction.

Credit markets present a particularly well-defined credibility problem because outcomes are transparent (repayment), and both borrower and lender must sustain a reputation in order to permit the leveraging of capital. Institutions such as credit bureaus and credit ratings agencies exist in order to provide measures of the quality of borrowers and of banks. In the new NGO-driven microfinance lending sector, this well-defined problem becomes more complex because investors seek a double bottom-line, pursuing social as well as financial gains. This introduces a fundamentally different form of credibility problem, one related more broadly to the humanitarian NGO problem of assuring donors of the social efficacy of their interventions. Non-profit microfinance institutions (MFIs) solicit direct donations or investments from private individuals, typically using social benefits to the borrowers as motivation. Recent evaluation studies that have failed to find a transformative impact of microfinance have raised questions about these claims (Banerjee et al. 2009, Karlan & Zinman 2009), and complicated the question of whether we should think of microfinance as a financial service or a humanitarian activity.

Peer-to-Peer (P2P) microfinance is a new modality that has emerged in recent years, allowing private parties to provide lending capital directly through the internet to borrowers in developing countries (Bruett 2007, Flannery 2007). The institution is created by linking local NGOs (developing-country MFIs) with an international NGO monitor/fundraiser (the P2P institution). The best-established microfinance P2P lender in the US is Kiva.org. To use it, individuals go online to view details on the loan terms and business investment of an individual entrepreneur in the developing world, as well as a picture and some personal information of the entrepreneur, and the repayment performance and financial details of the MFI sourcing the actual loan on the ground. Loans made through Kiva are zero-interest both for the lender and for Kiva itself, while the loan to the entrepreneur is made at the MFIs typical rates. The entrepreneur then repays the MFI and the MFI repays the P2P institution, and the original lender can then either reloan the principal or donate it to Kiva's operations. The five year-old organization has lent $100 million to 200,000 borrowers with repayment rates of over 98%.

Kiva serves as a particularly interesting case in the context of this volume because it is both a monitor of other NGOs and a quasi-humanitarian NGO with a need to maintain its credibility with a donor base. It represents a clear example of a network of NGOs creating a set of private, voluntary standards that permit a completely new form of quasi-humanitarian activity. This complex high-tech network enables lending between private individuals across developed and developing countries in the absence of any domestic or international regulator who could enforce the credit contract. The mechanism is, therefore, entirely dependent on the credibility of Kiva itself. Kiva's system for establishing the financial credibility of its NGO microfinance collaborators is simple and successful, but some aspects of the humanitarian credibility of Kiva has been under attack. David Roodman of the Center for Global Development used data posted on Kiva's own website to criticize their operations, showing that more than 95% of the loans presented on Kiva have in fact already been disbursed to the clients by the time they are put online. This chapter documents a specific case in which an allegation of misrepresentation was made against the organization, and the concrete ways in which it responded in order to maintain its credibility. As I shall show, Kiva's primary response – similar to that of Islamic Relief when it's credibility was similarly challenged (see Thaut, Barnett, and Stein, Chapter 6) -- was to increase its already high level of transparency.

Yet, two additional issues are raised here in terms of the credibility of P2P microfinance. First, by comparing the default rates of the loans posted on Kiva to the overall rates in the MFIs that issue the loans we demonstrate that the MFIs are paying off loans through Kiva even when the underlying loan is in default. The very robust MFI scoring system that Kiva has devised makes this an entirely rational response, but this suggests that the loan is really made to the MFI and not to the ultimate borrower. Next, we argue that the types of clients who are posted on Kiva are very likely to have received loans in the absence of the P2P channel. This in no way negates the role of P2P venues in increasing access to finance for MFIs, but does again imply that the apparent personal link between the donor and a specific client is mostly illusory. These three issues (pre-financing of loans, MFIs paying off defaulted loans, and

redirection of credit) raise complex questions as to the nature of the claims being made by this NGO intermediary and the ways in which the credibility of such institutions should be evaluated.

These issues are germane because P2P microfinance appeals precisely by offering a very personalized form of NGO activity: the targets of Kiva's activities are the individual recipients of the microloans, and the ultimate principal is the public. The specific attraction of such a vehicle to potential donors is precisely the decentralized, human-to-human nature of the link (as compared to investing in a social enterprise fund, giving money to an MFI, or giving political support to higher aid spending, for example).[2] This personalized link, however, passes through the hands of two layers of NGO intermediary. We can think of the operations of Kiva in terms of being two sequential PA games: Kiva delegating the monitoring of borrowers to local MFIs, and the lender delegating monitoring of the MFIs to Kiva. Both of these PA problems must be solved simultaneously in order for the P2P channel to be fully incentive-compatible. To the extent that P2P microfinance is a financial service, this two-layered contract functions spectacularly well. At the same time, the very success of the Kiva scoring mechanism in generating high MFI repayment creates a tension with the premise that one peer is extending credit to another.

This in turn raises complex questions about institutional reputation and the exact nature of the claim being made by Kiva: are they saying that people *like* the ones on the website will have credit expanded to them if you use the P2P channel, or are they making the claim that the *individual* shown on the website will be extended a loan *if and only if it* is funded through Kiva? Despite the highly formalized system of private standards used by Kiva to score its partner MFIs, the credibility of claims such as these will have to be established with the general public in a manner quite typical of the broader set of NGO institutions considered in this book.

[2] Claims made by this NGO are likely to be credible because of a common interest between the NGO and its audience (again quite personalized in the husband-and-wife Flannery team, founders of Kiva), and because of a very clear set of penalties established by Kiva.

On the one hand, this chapter documents a surprising success story. Faced by a delegation problem (lender/donors in one country need to monitor the attributes and behavior of borrowers in another) and the absence of a legal mechanism (because credit bureaus don't exist in the borrower's country), an interlinking set of NGOs spring up to meet the need. The umbrella NGO seeks to be transparent and therefore makes data on its activities freely available, and when a watchdog uses that data to criticize the credibility of the NGO the institution responds immediately, altering the nature of the claims made. At a deeper level, however, it is a cautionary tale in the way that that the self-interested incentives of institutional players drive the actual functioning of NGO monitoring institutions. The Kiva monitoring system works admirably as a financial contract, but the lifeblood of the organization appears to be in the personal, individual nature of the link it creates between lender and borrower. This chapter probes the extent to which a quasi-humanitarian organization such as Kiva can be credible to its audience if its financial claims are robust but the human connection underlying its appeal is largely illusory. If its practices were fully disclosed, it might threaten the perception of common interests between Kiva and its donors, make it more difficult to build bonds around common values, and further undermine its credibility (see Gourevitch and Lake, Chapter 1). It is not clear that the KIVA audience is affected by these criticisms, but it is clear those who run KIVA are concerned enough to have altered their presentation and framing of their activities.

2. Criticism of the Timing of Kiva's Loans, and the Response.

David Roodman of the Center for Global Development wrote a short blog which ended up being very widely circulated[3], illustrating that the large majority of Kiva clients actually had their loans disbursed to them *before* the loans were officially funded by Kiva investors. This criticism triggered a response from Kiva and an alteration in the claims made on their website which is in itself a fascinating window into the strengths and weaknesses of NGO monitoring. In his original critique, Roodman makes the following statement:

[3] http://blogs.cgdev.org/open_book/2009/10/kiva-is-not-quite-what-it-seems.php

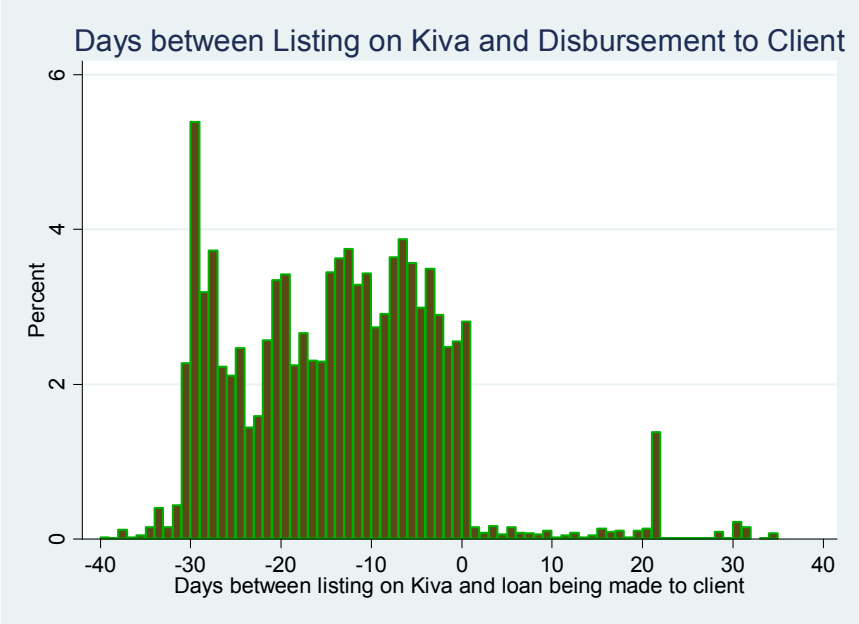
Kiva is the path-breaking, fast-growing person-to-person microlending site. It works this way: Kiva posts pictures and stories of people needing loans. You give your money to Kiva. Kiva sends it to a microlender. The lender makes the loan to a person you choose. He or she ordinarily repays. You get your money back with no interest. It's like eBay for microcredit.

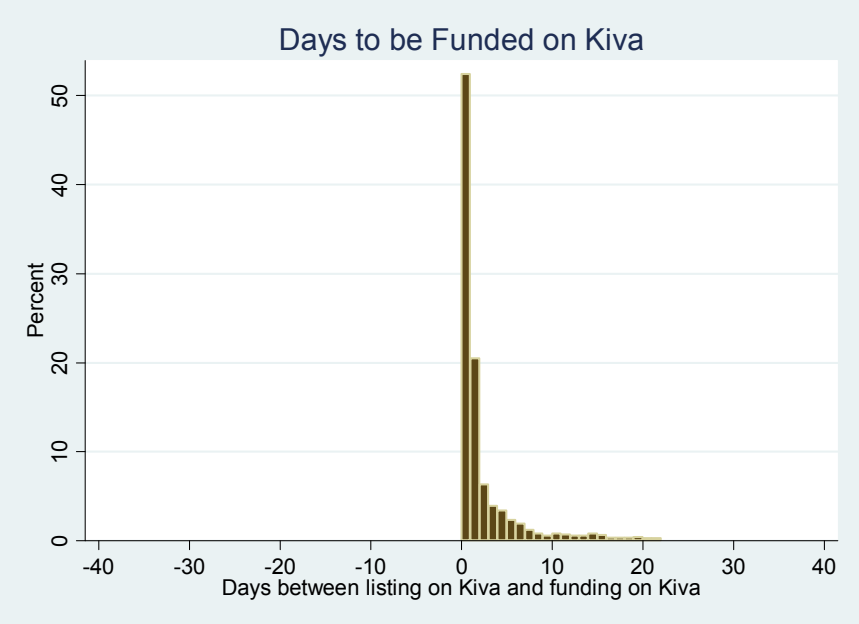
You knew that, right? Well guess what: you're wrong, and so is Kiva's diagram. Less that 5% of Kiva loans are disbursed *after* they are listed and funded on Kiva's site. Just today, for example, Kiva listed a loan for Phong Mut in Cambodia and at this writing only $25 of the needed $800 has been raised. But you needn't worry about whether Phong Mut will get the loan because it was disbursed last month. And if she defaults, you might not hear about it: the intermediating microlender MAXIMA might cover for her in order to keep its Kiva-listed repayment rate high.

In short, the person-to-person donor-to-borrower connections created by Kiva are partly fictional. I suspect that most Kiva users do not realize this. Yet Kiva prides itself on transparency.

Roodman does not provide any detailed statistics on the nature of the pre-lending problem, but he posts an extract of data from the Kiva website that can be used to form a visual representation of the problem. The Kiva data posted by Roodman provides information on 8,204 individual loans from 87 MFIs that were posted on the website between August 22 and October 1, 2009. In the following frequency plots, zero represents the day on which a loan is posted to the Kiva website. While it is the case that fewer than 5% of the loans are disbursed after having been posted on Kiva, it is also the case that fewer than 5% of the loans are disbursed more than a month prior to being posted. Hence while the pre-funding phenomenon is pervasive, it is temporally very limited. In the bottom panel we see that more than 50% of the loans posted are funded in the first day and 95% are funded within two weeks.

Figure 1. Timing of Lending, Posting, and Online Funding through Kiva.





Roodman illustrates the importance of (and potential abuses of) personalization using the 'save a child' campaigns sponsored by numerous international NGOs over several decades. He describes an investigative expose run by the Chicago Tribune in 1998 that documented patchy or no benefits accruing to sponsored children, and at the more extreme end of the spectrum, forged 'Christmas letters' sent from sponsored children who had died several years previously. In trying to understand whether this personalized link is important, Roodman says:

Undoubtedly some hard-sell charlatanry was at work. But the problem was deeper than that: a tension between creating the psychological experience of connection that raised money and the realities of fighting poverty. Often the fairest and most effective way to help poor children is by building assets for the whole community such as schools, clinics, and wells. Often charities contract with locals to build these things. Often things go wrong because of corruption, bad luck, or arrogance among outsiders thinking they know what will work. In the best cases, charities learn from failure. All these factors break the connection between giving and benefit, sponsor and child. But admitting that would have threaten the funding base.

This blog received widespread discussion on online forums such the Development Finance listserve run by the Ohio State University. The furor was sufficient to provoke a response from Matt Flannery, the CEO of Kiva.[4]

Most of Kiva's users have very casual knowledge of microfinance. In fact a large percentage of them had never heard of microfinance before Kiva and had never donated or lent to an international cause. This presents a major challenge in terms of simultaneously educating them and empowering them to make an impact in our field.

Our approach to this challenge has been to provide a very easy way to engage users, and provide a wealth of information to them as they become more curious. The oversimplified nature of our home-page reflects this broad strategy. Certainly the Kiva homepage does not describe the nuances of microfinance or Kiva's approach. In fact, it largely ignores the details. However, it is our intention to provide every last detail of the mechanics of Kiva to those curious users. My hope is that, for those that care to delve deeper, users can learn all they need to know—and more—by looking at our website alone.

Flannery explains the pre-financing of loans on Kiva as a phenomenon that emerged over the course of time; early MFIs did inded wait for funding from Kiva to disburse, but as time passed they worked with larger and more liquid MFIs, and these partners saw that the loans were funded so quickly once posted on Kiva that there was no point in waiting for them to be posted before making the loans (the figures presented above confirm this).

Perhaps Flannery's most interesting rejoinder in terms of thinking through the long-term viability of NGOs as monitoring organizations is the following:

Further, I want to assert that Kiva doesn't fear that complete honesty would undermine growth! In my humble experience, I've learned that honesty creates stronger bonds between the organization and its constituencies. Time after time, this lesson has been reinforced, and it is a lesson which affects many operational decisions within the organization to this day.

[4] http://blogs.cgdev.org/open_book/2009/10/matt-flannery-kiva-ceo-and-co-founder-replies.php

Here, however, his reponse may be disingenuous: while it is certainly the case that the long-term viability of Kiva as an intermediary depends on a reputation for veracity, it is also the case that a large part of the rapid growth of Kiva relative to the more un-personalized vehicles through which private parties in rich countries can fund microfinance is precisely the appearance of a direct human link. Hence, it is far from clear whether Kiva will grow more quickly in the coming years through being straightforward about the real link with the MFIs or through continuing to market an appearance of individualization that is not strictly correct.

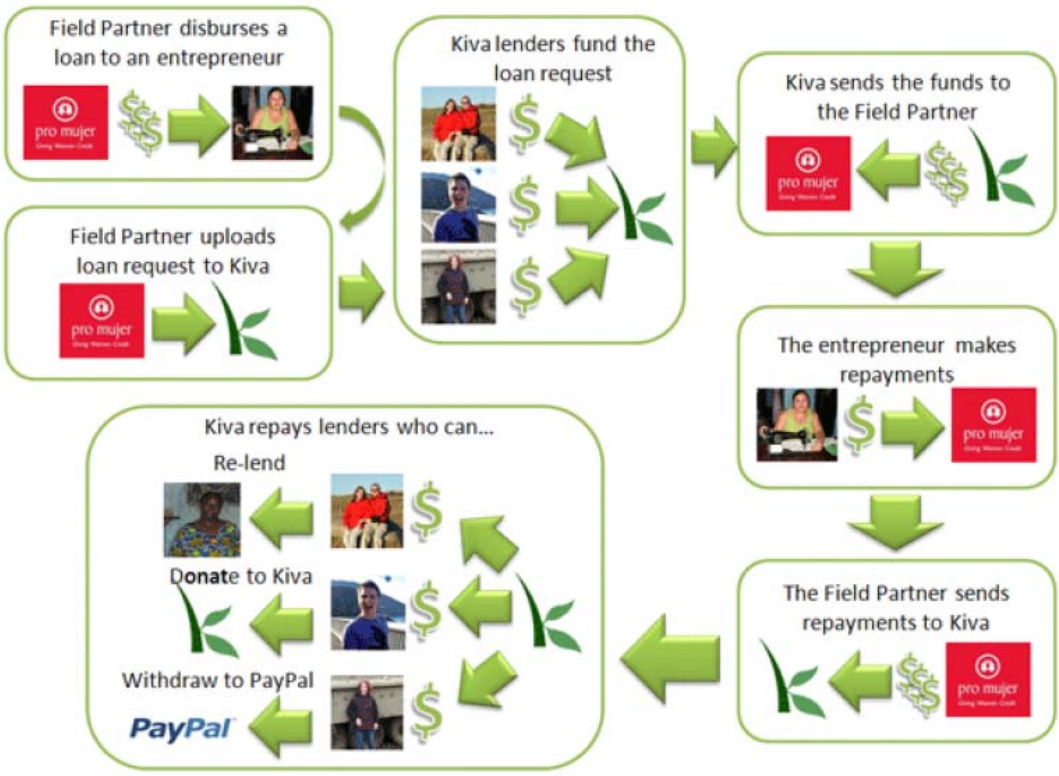
Kiva did, however, undertake a redesign of their website that attempts to clarify the details of the chain that connects 'peer to peer' through their service. It is interesting to compare the old flow chart:

Figure 2a: Old Kiva Website Flow Chart.

with the new one:[5]

Figure 2b: New Kiva Website Flow Chart.

[5] Source: http://blog.givewell.net/2009/10/12/two-pictures-of-kivaorg/



Several substantive changes appear here. First, the new graphic reverses the relative timing of disbursement and posting of the loan. Secondly, the new graphic makes much clearer the central role played by the MFI in collecting and relaying payments. Hence the response to Roodman's criticism seems to have come primarily in amplifying the apparent role of the MFIs and in dropping any explicit claims that the funding of the loan on Kiva preceeds disbursement.

Two primary questions arise in thinking through the timing issue. The first is, should we care? Flannery points out that the MFIs themselves exist in a competitive, customer-focused market and hence have no interest in making borrowers wait for credit when their competitors will not. Flannery does not make the additional relatively obvious point that requiring MFI field staff to make two visits to disburse will impose substantial additional costs on the lender, thereby decreasing the benefits of using Kiva financing and decreasing the sustainability of the organization if they do use Kiva. Hence the issue of having loan prefinanced by a time period rarely exceeding a month may appear relatively unimportant (and indeed efficient) in the grand scheme of things.

Having introduced the current debate over the credibility of Kiva's claims, we now formalize the reputation problem in credit markets in order to argue that the 'target' of Kiva's operations are not in a simple way the personalities viewed on the website at the time that lending decisions are made. We begin by tying the monitoring problem explicitly to the institution of credit bureaus, and describe in some detail the way that Kiva's internal monitoring system works. With this structure established, we explore the specific types of clients likely to be newly lent to as a result of the expansion of P2P microfinance versus those shown on the website, and show that a disconnect exists. We then consider the strategic incentives created by the monitoring systems in terms of default, and show that this implies that the true 'target' of the use of Kiva is not the pictured borrowers but the NGOs from whom they receive credit.

3. Formalizing the Critique of Kiva: The Role of Credit Market Information.

Microfinance lenders typically use joint liability (Besley and Coate 1995, Ghatak and Guinanne 1999), dynamic incentives (Morduch 2000), and social capital as collateral in order to attempt to compel repayment on uncollateralized loans. NGO MFIs lend to loss-making market segments that would be unserved in a purely profit-driven market, and these financial losses are justified by the social impact of the activity. The sources of funding for microfinance (whether private donations, support from development agencies, or concessional loans from development banks) typically have at least partially humanitarian objectives.[6] To achieve its 'double bottom-line', then, a microfinance lender must perform both as a financial institution and as a development institution.[7]

The signal formal institution for screening and monitoring in lending markets is a credit bureau (Jappelli and Pagano (1993), Padilla and Pagano (1997, 2000)). Bureaus expand uncollateralized lending because they strengthen the ability to punish through the scoring mechanism rather than through seizure of assets. In terms of their organizational structure, such information sharing systems may be

[6] An estimated 5 billion US dollars has flowed from the developed world to microfinance lenders over the past decade.

[7] Despite the unarguable success of MFIs as financial institutions, the past year has seen the release of several careful studies indicating that the socio-economic impact of microfinance is likely to be modest (Banerjee et al. 2009, Karlan & Zinman 2009).

public (credit registries) or private (credit bureaus) (Luoto et al, 2007). Public registries may contain broader information on utility payments, legal actions, or liens, but private bureaus offer sophisticated services tailored exactly to the needs of private-sector lenders. Most middle-income countries have for years featured some degree of credit reporting on individuals who participate in the formal banking system, but until recently this represented a small and stable share of the population. With the explosion of microfinance and other 'bottom of the pyramid' lending, however, formal repayment information is now being collected for a large new entrepreneurial class. The creation of credit bureaus to cover these markets, and particularly the integration of such bureaus with well established pre-existent commercial bank bureaus, therefore promises to be an avenue towards building the 'missing middle' of the credit ladder (McIntosh & Wydick, 2005, de Janvry et al 2009).

In developed-country contexts, the presence of dense credit histories and real-time credit reporting systems allow 'reputation' to be captured very succinctly in a credit score, most commonly the FICO score.[8] In the dense U.S. credit reporting environment P2P lending markets such as Prosper.com are enabled by good credit information in two ways. First, the bureau reduces adverse selection by preventing those with bad prior reputations from getting access to P2P loans. Second, once a loan is given the presence of credit reporting incentivizes high repayment by linking credit availability from all lenders to the repayment on the P2P loan, and thereby combats moral hazard. The tremendous punitive capacity of scores such as the FICO score in the US allow countries with strong information systems to dispense entirely with the intermediation of banks: peer-to-peer lending venues such as Proper.com are able to offer limited liability lending to complete strangers by private individuals.

For a borrower located in a developing country, however, few avenues may exist through which to signal quality to prospective lenders. Particularly when these prospective lenders are in a different country and have poor information gathering capacity, the set of feasible contracts may feature such severe asymmetric information as to preclude any transfers at all. If anything, the importance of screening and monitoring are greater in pro-poor credit products such as microfinance lending than in

[8] The U.S. credit reporting system is dominated by three firms: TransUnion, Experian, and Equifax.

mortgage lending, where the collateral on the loan should make the loan self-policing. Microfinance loans are 'limited liability' loans because the lender is only able to force the borrower to surrender assets worth a fraction of the loan in the case of default, and so borrowers are not fully financially liable for the loans they take (Stiglitz, 1990; Besley and Coate, 1995; Ghatak, 1999). In this environment lenders need to maintain other kinds of incentives (such as group lending or the denial of future credit) in order to compel repayment (Wydick 1999). Over the course of the past decade microfinance markets have evolved overlapping formal and informal institutions that serve to screen and monitor (Navajas et al 2001, de Janvry et al 2009).

Microfinance P2P websites can be distinguished strategically by the fact that they do not link to any independent source of information on the reputation of the borrower. They may or may not attempt to create some internal reputation for the borrower, but fundamentally the screening and monitoring required to conduct uncollateralized lending are left to the microfinance lender alone. P2P lending appears to be inherently limited liability in the sense that the infrastructure required to collect and liquidate collateral is complex and difficult to delegate, and therefore cannot be conducted online between strangers in a cost-effective manner. This combination of features focuses the strategic incentives in microfinance P2P lending on the local microfinance lender, the only part that can credibly collect from locals as well as credibly contract in a dynamic sense with outside entities.

To overcome their informational disadvantage, P2P credit markets which connect rich-world lenders to poor-world borrowers must look for creative ways to score institutions, and to enforce contracts with them once money has changed hands. What has emerged with rich-to-poor P2P sites such as Kiva.org is an multi-tiered system of credit scoring. At the most basic level, these new systems are working. From its startup in 2005, Kiva.org has reached 200,000 borrowers and lent almost one hundred million dollars. Despite this breakneck growth, Kiva has an overall default rate of less than 2% and a delinquency rate of less than two tenths of a percent among the lenders currently using the system

(relative to typical microfinance default rates of 2-5%).[9] The premier US-based P2P lending outlet is Prosper.com, which has disbursed almost two hundred million dollars, and reports a 90-day delinquency rate of around 2% on all credit classes of loans[10].

Kiva offers loans only through in-country MFIs, and Kiva scores the MFI on the institution's repayment record to Kiva borrowers, thereby generating strong incentives for the MFI to control default even though the individual carries little or no reputational capital in the system. Kiva does not currently score the individuals requesting loans. Rather, Kiva scores its Field Partners with a five star rating system. This is an amalgamation of reputation scores from third parties such as MIX (The Microfinance Information Exchange[11]), financial information such as current portfolio size and risk, audits conducted by Kiva through local auditing agencies and journal entries about borrowers written by Kiva Fellows. Kiva mostly uses their rating system to distinguish newer partners who do not have an established track record and may not be found on international microfinance indices (like MIX[12]) from their more established counterparts. The most common form of punishment is the closing of the account.

Only one case has been documented where a Kiva rating was lowered rather than closing the account. This was due to a portfolio-wide delinquency in payments. MIFEX, a savings and loan cooperative (credit union) located in Guayaquil, Ecuador, specializes in agricultural loans and has collection periods that do not align well with Kiva's system. Kiva disclosed that "MIFEX has recently come up against liquidity challenges that have affected their repayment performance on Kiva[13]." This was the cause for the demotion from three stars to one star. More commonly Kiva has had to punish their field partners by closing their account for more serious violations, most commonly incorrect use of funds or insolvency.[14] Five cases have been reported where Kiva has had to take such action. Four were for misuse of funds and one was for insolvency. These violations were uncovered during routine field partner audits.

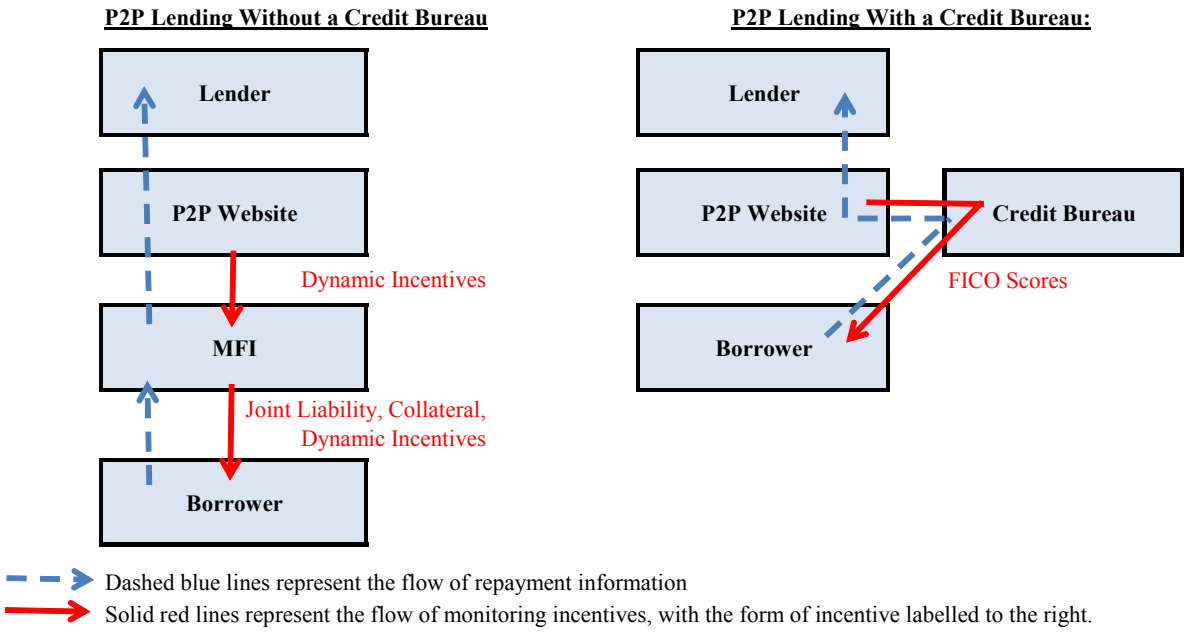
---

[9] http://www.kivadata.org/summary.html
[10] http://www.prosper.com/invest/performance.aspx
[11] http://www.mixmarket.org/
[12] http://www.mixmarket.org/
[13] MIFEX Partner Page: http://www.kiva.org/about/aboutPartner?id=7
[14] Cases of misuse: Seed: http://www.kiva.org/about/aboutPartner?id=32

Individual microfinance borrowers in developing countries have long-term relationships with the MFI and repay under joint liability contracts that tie future credit access both for the individual and the group to the individual's current repayment, thereby generating strong incentives to repay even though these loans are typically uncollateralized. The MFI, in turn, forms a long-term relationship with the P2P site, and the future access of the entire MFI to zero-interest Kiva credit is tied to the repayment performance of each loan made to the MFI. Hence loans are repaid in this four-step chain despite the fact that no party has a credible relationship with an organization more than one link above them in the chain. That is to say, an MFI borrower would not repay Kiva without the MFI in between them, and the MFI would not repay the private 'lender' of funds without Kiva in between them.

We can represent the flow of information and monitoring in the following way:

Figure 3. Flow Chart of Money and Information in P2P Lending.



Information on individual repayment does not need to reach the lender in a MF P2P system (and to our knowledge no such P2P lenders report on the repayment performance of the individual borrower).

WITEP: http://www.kiva.org/about/aboutPartner?id=11
AE&I: http://www.kiva.org/about/aboutPartner?id=53
RAFODE - http://www.kiva.org/about/aboutPartner?id=33
WEEC: http://www.kiva.org/about/aboutPartner?id=6

Without a bureau, only the MFI has the capacity to monitor and enforce repayment on the borrower, and so borrower-level repayment information is irrelevant to the P2P website's ability to maintain the contract. What is necessary is that the MFI's reputation is at stake with the P2P website, and hence the mechanism credibly delegates the responsibility for monitoring on to the only agent able to carry it out. This system is thus fundamentally one of a relationship between institutions, and the bottom-level link of MFI to borrower exists independent of the other links created by the mechanism. The presence of a credit bureau, on the other hand, confers upon the P2P website the ability to directly monitor and punish the behavior of the borrower, and so the P2P mechanism is engaged in a fully individualized contract with the recipient of the loan.

Seen from this perspective, only where a bureau exists can we really refer to such lending as 'P2P'. Where we require a local lender as intermediary to issue and monitor the loan then such lending might better be called 'P2MFI' because the actual repayment of the individual who gets the loan becomes irrelevant and only the MFI's overall record of repayment to the website intermediary determines future access to capital. The critical repercussion of this monitoring regime is that it delinks the apparent 'target' of the use of Kiva (the person whose picture is shown on the website) from the actual target, namely the MFI itself. We now investigate in more depth two ways in which this delinkage takes place.

4. Client Selection and Who Gets Listed on Kiva.

The fact that a borrower gets a loan funded through Kiva does not imply that the borrower would not have gotten a loan in the absence of the P2P NGO. In this sense P2P MF does not necessarily *cause* credit to be extended to all the borrowers funded by their activities. It is entirely possible that there is a new client to whom the MFI would never have made a loan before and who they find knowing that they will be able to get them funded on Kiva. Indeed, the very rapid funding of loans indicates precisely that the MFI would be rational to pre-fund the loan even if it wouldn't have made the loan without access to Kiva. Hence Kiva can be causal to the creation of a new loan even with pre-financing. Conversely, even if the loan is disbursed after posting on Kiva, it appears quite likely on inspection that many if not most of

the clients listed on Kiva would have received funding from the MFI even if the MFI did not use Kiva. Therefore pre-funding and the extent to which Kiva funding *causes* a specific loan to be made are logically distinct concepts.

In order to present a very simple framework in which to consider this question of who would have been funded in the absence of Kiva, we present a stylized model of microfinance lending. Kiva neither pays interest to individuals using its website, nor does it charge interest to the MFIs. Hence it represents a free source of lending capital, except for the (not insubstantial) fixed costs per loan imposed by providing the photographs and narratives required for posting. For an MFI to choose to use Kiva, the P2P portal must represent a new and lower-cost source of capital. Our model considers how this fall in the costs of capital alters selection in a credit market.

We assume that MFIs are interest rate price-takers in local lending markets, and that every potential client wants to borrow one unit of capital. The profitability of a given individual for the MFI is therefore simply a function of the repayment probability and the cost of capital. The lender uses a scoring model to convert a set of borrower-level observable attributes X_i into the predicted probability of repayment, given by $p_i(X_i)$. While it is most straightforward to think of this score is a formalized quantity such as a FICO score in a market that features centralized bureaus and scoring services, it may represent a more informal reputation in markets based more heavily on personal relationships and reputational capital.[15]

An MFI has access to capital at a cost *c,* and it then lends it at a rate *r*, and so the problem of the lender is to maximize the sum of profits across all potential borrowers, or

$$Max \ \sum_i \left[p_i(X_i)(1+r) - (1+c) \right].$$

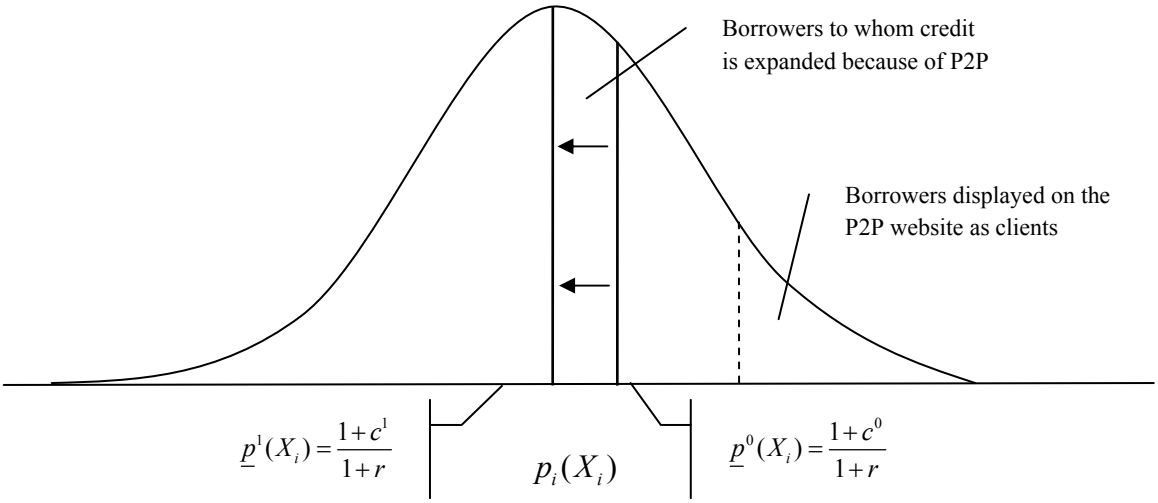
[15] Note that we can considerably broaden the scope of the argument by thinking of $p(X_i)$ as being a social weighting function in microfinance markets, where gender-based or pro-poor targeting will cause clients other than the most profitable to be thought of as desirable in the lender's objective function.

The MFI lender will give loans to all borrowers with positive expected profits, and the lowest-profit individual given a loan is the person on whom the lender expects exactly to break even. We can solve for the identity of this 'breakeven borrower', $\underline{p}(X_i) = \frac{1+c}{1+r}$.

Beginning from this market equilibrium, we can now model the effects of access capital from a P2P institution. The MFI will only use the P2P capital if it is cheaper than the other sources of liquidity available, and so for all participating MFIs we assume that the P2P institution lowers the cost of capital from c^0 to c^1. Examining changes in the break-even borrower, we see that $\frac{d\underline{p}}{dc} = \frac{1}{1+r} > 0$. This says that as the cost of capital falls, the MFI will be willing to lend to an individual with lower expected returns, and so $\underline{p}^0 > \underline{p}^1$. While the MFI may *use* P2P capital to lend to people that it would have lent to before, and while the *profit* from lending to those people may increase as a result of having lower-cost capital, the causal effect of this new liquidity source is to expand access to a group of individuals less reliable as clients than those that were being served before.

We can think of the MFI as a lower-tier lender and the loan targeting process of the P2P site as a higher-tier lender. The simplest assumption to make is that the selection criteria of these two different layers of lenders are the same, meaning that a client who is attractive to one is also attractive to the other. In this case, it is the values with the highest value of $p(X_i)$ that will be most attractive to list on the P2P site. This creates a disconnect between the individual identities of those represented on the P2P site and those causally brought in to the market by the use of P2P credit. Figure 4 draws the density function of $p(X_i)$ to illustrate the tension.

Figure 4. Impacts of P2P Credit on MFI Market Access.



The introduction of less expensive P2P financing pushes the breakeven borrower down from $\underline{p}^0$ to $\underline{p}^1$, and hence brings a new set of borrowers into the MF marketplace. For each loan given, the MFI is asked to provide a specific borrower to the P2P institution, and particularly if these borrowers are individually scored then the MFI begins from the right-hand tail of its repayment distribution in selecting which borrowers to display on the website. Because the number of clients must match, the density between $\underline{p}^0$ and $\underline{p}^1$ will equal the density to the right of the dashed vertical line, which represents the least reliable borrower that will appear on the website.

Hence, there is likely to be a disconnect between the types of people shown on P2P MF websites and the types of people who actually receive credit as a result of the existence of such P2P institutions. There is no direct causal claim of the type 'we will not fund this person if their Kiva loan is not fully funded', and so as long as the picture recipient does in fact get a loan, then the contract fulfilled on the website has been nominally fulfilled. An MFI that was, for example, expanding into new remote areas with marginal credit but posting only those nearby borrowers on whom it easy to gather the information required by Kiva might never show on the website a borrower who would not have received credit in the absence of Kiva.

5. Default in a P2P Microfinance System.

A large literature describes the 'joint liability' contracts used by microfinance lenders. Such contracts are designed to coerce repayment in the absence of collateral by making future lending to any individual member of a group conditional upon successful repayment of the group loan. The idea is that borrowers are then forced to cross-insure, and also have incentives to monitor each others' actions and do what they can to induce their fellow members to repay. In this way the group carries a reputation which drives incentives to select and insure. Again, an analogy exists for the actions of an MFI lender once an organization like Kiva begins to score repayment.

The incentive to cross-insure takes on an unusual dimension with P2P loans, because normal loans to an MFI are made to the institution, which can then deal with default on any specific sub-loan as it wishes. The other sources of lending liquidity available to the MFI are in not linked to the underlying repayment performance of individual borrowers. A development bank making a loan to an MFI will care only about the repayment of the MFI to the bank, and not whether the sub-loans made by the MFI were repaid. Only P2P-linked credit attempts to make this link, and this introduces a very clear set of strategic incentives for the MFI, effectively pushing it to the extreme of perfectly insuring all repayment on sub-loans. Since the cost to the MFI of paying off a loan to Kiva on which there was actually default are very low (the average individual loan size is $650) and the benefits from retaining a good relationship with Kiva are large (the average partner MFI has acquired over $850,000 in lending capital from Kiva), the MFI simply pays off the loans when the borrower defaults.

Take a lender with a stable default rate who has set aside an adequate loan loss reserve. In any period default is predicted correctly on average and the reserve exactly covers default without changing the cost of capital. Default by the portion of the MFI's portfolio arising from P2P funding, however, carries an externality effect on the whole portfolio, because the rating of the MFI will fall, constricting access to P2P credit for the whole institution. If the punitive effect of default on a single group is larger than the cost of repaying that loan, the MFI will face a strictly lower cost of capital if it uses its loan loss

reserve to repay all group loans made through the P2P with the loan loss reserve than if it allows these groups to be registered as defaulters. This says that there is a threshold punitive value of the MFI's reputation to the P2P beyond which the MFI will choose to provide P2P lenders with 100% repayment, regardless of the real performance of those loans. This suggests that no link at all exists between the underlying reliability of the clients and their apparent repayment performance to Kiva.

Kiva also features an option called 'default protection', under which the MFI can explicitly choose to indicate that they will pay off the loan in case of default by the underlying borrower. There are no micro-data available present for the use of the option at the loan level, but a visual inspection shows that even many MFIs not explicitly offering default protection nonetheless have exactly zero default through Kiva. Hence whether this coverage is explicit or implicit, the scoring incentives are sufficiently strong to make all MFIs that use Kiva on an ongoing basis pay them off when they default.

One way of establishing this dissonance in default rates empirically is to compare the default rates reported by partner MFIs to Kiva with the overall institutional default rates of these same organizations as reported to the MixMarket, a microfinance website. Using the sample of loans from Aug-Oct 2009, the historical default rate on all Kiva loans is exactly zero for MFIs representing 99.89% of the loans made through Kiva, and .0103 for the sole institution that records any history of default in this time window. How do these default rates through Kiva compare to default in the MFIs as a whole? To answer this question we can link the MFI-level information provided by Kiva with data from the MixMarket, the most comprehensive repository of performance statistics for microfinance lenders. We are able to match 105 of the 133 MFIs provided by Kiva to the MixMarket, and we can compare repayment performance through the P2P channel to overall repayment in the MFI as a whole.

Table 1. Repayment Performance through Kiva versus Overall, MFI Level.

Table 1 uses the broader Kiva data reflecting the whole history of the institution, and provides average outcomes across MFIs, broken down by the partner risk rating of the MFI as rated by Kiva. The table provides clear evidence of the threshold effect suggested above; there is a clear break in performance in Kiva for those MFIs with two or fewer stars, where the average default rate is 12.3%, and those with three or more, where default is .01%. Interestingly, this does *not* correspond at all to the default rates found in those organizations overall, where the loan write-off rates are 1.29% and 1.55%, respectively. That is, institutional default is *higher* in the group of lenders who maintain virtually zero default to Kiva. Clearly, the Kiva contract of scoring MFIs is dividing them in to two groups, one of which chooses to pay off loans to Kiva all the time no matter what, and the other of which ends up with higher default to Kiva than it does overall. The fact that the detailed lending data on the MFIs still given access to the website as of the Aug-Oct 2009 period shows only a single active MFI with any history of default indicates just how strongly Kiva is using dynamic incentives to select only for those lenders willing to protect Kiva's users against any default risk whatsoever.

Taking the analogy to the level of the lending institution, we see MFIs as 'groups of groups', and the fact that P2P lending scores the institutions on loans made to its underlying clients induces exactly the same incentive to collectivize risk and cross-insure loans. The core difference is that, unlike in the informal and sometimes contentious environment of a microfinance group, the MFI provides a 'firm' to centralize this decision. We would therefore expect that the ultimate success of MFIs at preventing any default from their underlying group loans to Kiva will be much higher than the success of the

microfinance groups at inducing repayment among their individual members. Seen from this perspective, it is the tremendous *success* of P2P microfinance in placing repayment incentives on the parties below them in the funding chain that makes the link between the apparent and actual recipient of credit so tenuous.

6. Conclusion.

P2P microfinance has been enabled by the rise of a creative new set of multilevel monitoring contracts. The general public delegates monitoring to Kiva, who in turn delegates monitoring of the final loans to the MFIs that make them. The system works because Kiva has developed a highly effective, credit-bureau-like system for scoring MFIs and thereby has created a well-defined internal form of reputation. In this financial sense we have a reputation based on clearly monitorable and observable outcomes, and the mechanism is a success. The reputation that Kiva bears as a humanitarian organization, however, is more typical of an international NGO: there are no clear metrics for their performance in terms of social impact on the intended beneficiaries. Kiva's multi-layered system has imposed strong incentives on international intermediaries, has generated vanishingly small default rates, and yet has opened Kiva up to criticism for failing to honor the spirit of the contract offered by their website. Despite its success, Kiva's credibility is at issue.

Peer-to-Peer microfinance websites are complex monitoring institutions that must serve a variety of purposes to be effective. It is unclear, *prima facie,* whether these NGOs should be viewed as financial institutions or humanitarian institutions. One way of synthesizing the issues presented here is that the private standards they have developed to prevent problems on the financial side are so effective that they induce distortions on the humanitarian side. Specifically, the offer of interest-free funding to MFIs on the ground is highly attractive, but in order to receive this funding they must remain in excellent standing with Kiva in terms of repayment. The financial incentives of local MFIs cause them to do three things. First, pre-disburse loans prior to posting them on Kiva so that they do not have to visit clients twice in order to make loans. Then, in order to get the Kiva loans filled quickly they desire to post both needy and

reliable clients on the website, precisely the type of client to whom they would have lent anyway. Finally, the MFIs have very strong incentives to repay the loan for the client even in the event that the loan goes into default. The resulting contract looks a great deal more like a risk-free loan to the MFI, a claim presumably of substantially more limited emotional appeal. Hence systems such as Kiva.org are inherently not P2P, but rather P2MFI; the actual target is the intermediary MFI and not the other peer.

These new multi-party institutions are a great success story in interlinked NGO monitoring of transparent, externally verifiable outcomes such as repayment. The broader reputation of P2P microfinance lenders as an organizations providing social benefits and a meaningful and credible service to the general public, however, is likely to prove the key to their future growth. Ultimately, the question of credibility in the humanitarian dimension of P2P microfinance relates to the precise nature of the service being offered by these NGOs. Does the public see P2P sites as a generalized avenue to support microfinance, analogous to donating/lending money directly to an MFI, or do they value the direct human link created most effectively by P2P lenders? The rapid growth of Kiva and its competitors (combined with a rumored decline in contributions to the websites of major MFIs in recent years) suggests that it is the latter. In other words, the personalization offered by Kiva is a more effective substitute for direct MFI fundraising. More subtly, if indeed people value the direct personal link, do they see the individuals pictured on the website as emblematic of a type of beneficiary, or do they in fact value the idea that their money has gone directly to fund a person who would not otherwise have received a loan? Developing countries may not possess the institutional depth to support genuine *peer* to *peer* lending, in which case the public would need to be satisfied with the less glamorous claim of P2P microfinance as P2MFI.

The argument here is not that Kiva makes any incorrect claims; everything on its website (given the recent revisions prompted by Roodman) is correct: the stated individuals do in fact receive those loans on those terms, and the MFI repays loans to Kiva with exactly the frequency given. The emotional power of KIVA's framing does likely draw in more funds, thus expanding the number of people who get grants. The argument is rather that those individuals in all likelihood would have received loans in the absence of Kiva. Seen in the principal-agent framework, these new P2P lenders serve as a powerful

example of NGOs emerging to solve contracting and credibility problems that are not easily spanned by legal codes (in this case, both because the borrower countries do not have strong credit reporting institutions and because the lender and borrower are in different countries). The strategic indirectness of the linkage however, raises an underlying set of issues about the actual causal effects of institutions seeking to link peer with peer, and the claims that can credibly be made by P2P lenders. These institutions are emblematic of both the promise and the pitfalls of delegating complex networks of NGO intermediaries to serve as monitors. Overall, though, we see Kiva struggling with how to sustain its credibility while still presenting an emotional appeal to its donors. Like other NGOs examined in this volume, Kiva increased the transparency of its processes in response to external criticism. The question for the future is whether this will be sufficient in an increasing crowded marketplace as donors and borrowers become more familiar with the workings of microfinance systems.

Bibliography.

Banerjee, A., E. Duflo, R. Glennerster, and C. Kinnan. 2009. "The Miracle of Microfinance? Evidence from a Randomized Evaluation". Working paper.

Besley, T. and Coate, S., 1995. Group lending, repayment incentives and social collateral, Journal of Development Economics 46, 1-18.

Bruett, Tilman. 2007. Cows, Kiva, and Prosper. Com: How Disintermediation and the Internet are Changing Microfinance, Community Development INVESTMENT REVIEW, Federal Reserve Bank of San Fransisco, Volume 3, Issue 2, 2007

de Janvry, Alain, C. McIntosh, and E. Sadoulet. "The Supply and Demand Side Impacts of Credit Market Information," Forthcoming , *Journal of Development Economics*.

Flannery, M. 2007., Kiva and the Birth of Person-to-Person Microfinance. *Innovations: Technology, Governance, Globalization* Winter/Spring 2007, Vol. 2, No. 1-2: 31–56.

Ghatak, M., 1999. Group lending, local information, and peer Selection, *Journal of Development Economics* 60, 27-50.

Jappelli, Tullio, and Marco Pagano. 1993. "Information Sharing in Credit Markets." *Journal of Finance* 48(5):1693-1718.

Karlan, D., and J. Zinman. 2009. "Expanding Microenterprise Credit Access: Using Randomized Supply Decisions to Estimate the Impacts in Manila." Working paper.

Luoto, J., C. McIntosh, & B. Wydick. 2007. "Credit Information Systems in Less-Developed Countries: Recent History and a Test." *Economic Development and Cultural Change*, 55(2): 313-334.

McIntosh, C., and B. Wydick (2005). "Competition and Microfinance", *Journal of Development Economics,* Vol 78, pp. 271-298.

Morduch, J., 1999. The Microfinance Promise. *The Journal of Economic Literature,* Vol. 37, pp. 1569-1614.

Stiglitz, J., 1990. Peer monitoring and credit markets. The World Bank Economic Review 4, 351-366.

Navajas, Sergio, J. Conning and C. Gonzalez-Vega, 2003. "Lending technologies, competition and consolidation in the market for microfinance in Bolivia," *Journal of International Development,* Vol. 15(6), pages 747-770.

Padilla, Jorge A., and Marco Pagano. 1997. "Endogenous Communication among Lenders and Entrepreneurial Incentives." *Review of Financial Studies*, 10(1): 205-236.

Padilla, Jorge A., and Marco Pagano. 2000. "Sharing Default Information as a Borrower Discipline Device." *European Economic Review*, 44(10): 1951-80.

Vercammen, J. 1995. "Credit Bureaus and Sustainable Reputation Effects in Credit Markets." *Economica,* 62 (248): 461-478.

Wydick, B., 1999. The effect of microenterprise lending on child schooling in Guatemala. Economic Development and Cultural Change, 47 (4), 853-869.