Emergence of Financial Intermediaries on Electronic Markets: The Case of Online P2P Lending

Sven C. Berger[1], Fabian Gleisner[2]

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Abstract: We analyze the role of intermediaries on electronic markets using detailed data of more than 14,000 originated loans on an electronic P2P (person-to-person) lending platform. On such an electronic credit market lenders bid for supplying a private loan. Screening of potential borrowers and the monitoring of loan repayment can be delegated to designated group leaders. We find that these participants act as financial intermediaries between borrowers and lenders and significantly improve borrowers' credit conditions. Our findings are robust to self-selection and characteristics of the financial transactions, and may be surprising given the long discussion on disintermediation due to electronic marketplaces.

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[1] University of Frankfurt, E-Finance Lab, Mertonstrasse 17, 60325 Frankfurt/Main, Germany. Phone: +49 (69) 798-22839. Fax: +49 (69) 798-28973. E-mail: sberger@wiwi.uni-frankfurt.de.

[2] Corresponding Author. University of Frankfurt, E-Finance Lab, Mertonstrasse 17, 60325 Frankfurt/Main, Germany. Phone: +49 (69) 716-77890. Fax: +49 (69) 716-77891. E-mail: gleisner@wiwi.uni-frankfurt.de.

1. Introduction

The evolution of information technology in recent years has led to the development of electronic marketplaces where traditional intermediaries may be less important or even redundant for economic interaction of market participants (see Evans and Wurster, 1997 for an literature overview, Benjamin and Wigand, 1995, Malone et al., 1989, Malone et al., 1987). There has been a long discussion on disintermediation and on the future relevance of financial intermediaries within the financial service industry (Nellis et al., 2000, Allen and Santomero, 2001, Schmidt et al., 1999).

The increasing role of electronic lending marketplaces (*P2P Lending* or *Social Lending*) leads to disintermediation by replacing a bank as the traditional intermediary (Meyer, 2007, Hulme and Wright, 2006). A recent study by the consultancy Gartner predicts that by 2010 such social banking platforms will grow to control ten percent of the worldwide market for retail lending and financial planning (Gartner Inc., 2008).

An electronic lending platform enables brokerage of consumer loans directly between borrowers and lenders. Still, new types of additional intermediaries emerge within these electronic marketplaces (Chircu and Kauffman, 2000, Methlie and Pedersen, 2002) as market participants provide paid intermediary services. We argue here that internet-based e-commerce may lead to greater rather than less intermediation as new roles for intermediaries evolve (Bakos, 1991, Bakos, 1998, Sen and King, 2003). Intermediation might always be important in the interaction of economic agents despite electronic marketplaces taking over some functions formerly provided by traditional intermediaries.

To address this question, we examine the role of intermediaries in more than 14,000 credit transactions on the American electronic P2P lending platform *Prosper.com*. Our empirical analysis is based on the literature on intermediation (e.g. Diamond, 1984, Leland and Pyle, 1976) from which we derive hypotheses on the role of intermediaries on electronic marketplaces.

The electronic lending platform Prosper provides an excellent laboratory for studying intermediaries on electronic marketplaces. Prosper is the largest provider with nearly USD 90 Mio in loans originated in the examination period from 2005-11 until 2007-09, as market participants were permitted to act as paid intermediaries in this time period. All loans on Prosper have an identical maturity of 36 months. Our data sample includes detailed information on 14,321 financial transactions as well as the involved market participants and

covers transactions with and without the use of an intermediary. This allows us to test for aspects of the financial transaction as well as individual factors that might influence the usage of intermediary services.

In line with traditional intermediation theory, we find that financial intermediaries on electronic P2P lending platforms have significant impact on borrowers' credit conditions, suggesting that intermediation helps to reduce the prevalent information asymmetries. A mandatory screening process by means of the intermediary's commitment to screen every loan listing within the group significantly improves borrowers' access to credit. The intermediary primarily contributes by screening potential borrowers. Following diligent screening, the intermediary's recommendation of a borrower signals better information about the creditworthiness and thus leads to better credit conditions. Moreover, bidding on the screened borrower's credit listing has an even stronger impact on the resulting interest rate.

Our results indicate that borrowers should consider the reputation of an intermediary. Furthermore, intermediation costs tend to offset potentially lower interest margins for borrowers. These results are robust to self-selection regarding the choice of an intermediary and characteristics of the financial transaction. All in all, our results suggest that financial intermediaries on electronic credit marketplaces may create substantial value for borrowers and, generally, that electronic markets create business opportunities for new intermediaries.

Our approach to examine the role of financial intermediaries on electronic lending platforms makes three important contributions to the existing literature on electronic markets and disintermediation. First, this is to the best of our knowledge the first study to empirically examine intermediation on an electronic P2 lending platform. Second, we provide insights into the role of intermediaries on the marketplace and estimate the impact of intermediation on borrowers' interest rates. Third, we analyze a potential self-selection in the demand for intermediation services on electronic marketplaces by applying a matching procedure.

The remainder of the paper is organized as follows: the next section gives an overview of electronic marketplaces and online P2P lending platforms. Section 3 summarizes the relevant previous literature on financial intermediation and derives hypotheses about the role of intermediaries on electronic lending platforms. Section 4 overviews the employed methodology. Section 5 describes the data and presents the empirical results of our analysis. Section 6 concludes with a summary and the limitations of our study.

2. Intermediaries on electronic credit marketplaces

2.1 Electronic marketplaces and disintermediation

Markets are essential for economic activity in mediating demand for and supply of goods and services. Intermediaries help to facilitate transactions between buyers and sellers by (1) providing transaction processing capabilities (2) bringing enhanced levels of knowledge and expertise (3) adding to the transactability of a given good or service (Chircu and Kauffman, 2000).

The internet has enabled electronic commerce (e-commerce) where electronic markets are becoming more important in coordinating supply and demand (Segev et al., 1999, Grieger, 2003). Electronic markets can facilitate economic activity even under complex and insecure conditions (Cordella, 2006), significantly reduce information and transaction costs, and may thereby displace traditional intermediaries (Chircu and Kauffman, 2000).

Many authors argue that once electronic markets emerge, traditional intermediaries may be threatened by an electronic brokerage effect also called *disintermediation* (see Chircu and Kauffman, 2000 for a literature overview). In sharp contrast to that, the theoretical contributions on electronic markets and disintermediation have not been supported by convincing empirical evidence yet (Chircu and Kauffman, 2000, Sen and King, 2003). Moreover, the displacement of traditional intermediaries may never occur. Authors like Sakar (1998) or Hagel / Singer (1999) argue that electronic markets may lead to new forms of intermediation.

2.2. Electronic lending platforms

Electronic lending platforms are electronic markets that mediate borrowers and lenders of loans. We focus here on consumer loans between individual borrowers and lenders and exclude platforms for bonds or syndicated loans (Meyer, 2007, Mitschke, 2007).

The electronic credit marketplace as a website in the World Wide Web constitutes the general conditions for person-to-person lending and provides administration of current loans. Electronic lending platforms differ in the way loans are originated. Some providers mediate borrowers and lenders themselves whereas other providers match borrowers' credit listings and lenders' bids with an auction mechanism (Meyer, 2007). There are numerous providers that operate nationally due to differing regulatory frameworks. Table 1 provides an overview of the three major Anglo-American and German providers and their business models.

< Table 1 >

Despite differing business models, there is one distinctive feature that these marketplaces have in common. Transactions on electronic credit marketplaces occur anonymously between fictitious “screen names”. Therefore information between borrowers and lenders is asymmetrically distributed. Loans are not collateralized and the marketplace faces inherent risk of default (Meyer, 2007).

In order to reduce information asymmetries lenders must screen potential borrowers. It can be costly or impossible to process the available information on potential borrowers given the large number of credit listings. Therefore intermediaries emerge on the electronic marketplace offering intermediary services in order to assess and limit credit risk.

2.3 Groups as intermediaries on Prosper.com

Prosper.com is America's largest people-to-people lending marketplace. In the observation period from February 2006 until September 2007 a total of USD 87.5 Mio in loans were funded. Although interaction occurs anonymously between “screen names”, loan listings contain additional information on potential borrowers. Lenders can evaluate individual creditworthiness through *quantitative* as well as *qualitative* figures.

As the two main *quantitative* figures, an individual rating and an indicator of indebtedness (a *Debt-to-Income Ratio,* DTI) are provided by Prosper in cooperation with the credit reporting agency Experian. The informational value of these *quantitative* figures should be considered high, although the degree to which consumer credit reports are accurate, complete or consistent is in dispute (Avery et al., 2003).

Market participants are able to provide additional personal information about their background, their financial standing and the purpose of the loan. This *qualitative* information is mandatory and its validity is a priori not controlled. Borrowers thereby might have an incentive to overemphasize their “quality” (the present value of the prospective projects, their financial standing or repayment morale) in their personal descriptions (*moral hazard*).

In addition to personal profiles, borrowers and lenders can form groups. These smaller communities within the marketplace review and assess the creditworthiness of individual members. Groups thereby act as financial intermediaries and are potentially beneficial for market participants by providing and verifying information or obtaining additional information about borrowers that is not publicly available.

Every participant of the online lending platform can found a group and become a group leader. Group leaders set membership criteria and administrate the group. Groups aim at lowering the risk of defaults and therefore

enable lending at better rates. Among the most important tasks of the group leader is therefore the screening of borrowers within the group (a voluntary due diligence known as “vetting”). Within groups, it is common that borrowers send personal documents regarding their identity, income and other pertinent information to the group leader. The group leader reviews the disclosed personal information and usually also establishes personal contact in order to recommend a borrower’s credit listing. The incentive for borrowers to disclose information to the group leader is to attract more bids on their credit listing in order to borrow at better interest rates. Group leaders also supervise the repayment of loans within their group. In case of default, Prosper informs the group leader who can encourage loan repayment and arrange limited repayments (called “community payments”) on behalf of a member who is not able to do so.

Group leader were permitted to receive compensation (“fees”) for their effort, acting as a paid intermediary. Group leaders could collect a fee in the form of additional interest for providing intermediation services until 2007-09-12, when Prosper.com modified the fee concept (Prosper Marketplace Inc., 2007). Considering intermediary services, borrowers faced the choice between “free” or “paid” intermediaries. It is a priori not clear if intermediation created value for the electronic marketplace and especially for the borrowers. We focus here on the value of intermediation for borrowers.

3. Development of hypotheses

There is extensive research on financial intermediation. In this section we review the relevant intermediation literature in order to derive hypotheses about the role of intermediaries on electronic credit marketplaces.

Traditionally, transaction costs and information problems have provided the foundation for understanding intermediaries (Allen and Santomero, 1997, Bhattacharya and Thakor, 1993, Dewatripont and Tirole, 1994, Santomero, 1984). Due to asymmetric information between borrowers and lenders, financial markets can perform poorly or even fail when borrowers know their characteristics (the present value of the prospective projects) but lenders cannot distinguish between them. Market value then reflects average project quality (Akerlof, 1970, Leland and Pyle, 1976). As a result “good risks” are driven out of the market and average project quality decreases (*adverse selection*). This can be the case if borrowers cannot be expected to be entirely straightforward about their characteristics since there may be a substantial reward for exaggerating positive qualities (*moral hazard*).

In his seminal article, Diamond (1984) argues that intermediaries can help overcome problems of asymmetric information by acting as “delegated monitors”. When several lenders in a loan syndicate want to monitor a borrower and monitoring is costly, there will either be inefficiently high monitoring expenditures or a free riding problem, where no lender has an incentive to monitor. In this case, a financial intermediary as a delegated monitor minimizes the costs of monitoring.

The argumentation is applicable to the lending platform Prosper for two reasons. Firstly, the capital of several lenders is syndicated into one loan. Secondly, lenders face a large number of credit listings on the marketplace. Lenders benefit from additional private information about borrowers in order to better assess credit risk and appropriate required interest rate. Acquiring private information about credit listings implies a time-consuming (repeated) interaction with the borrower which is costly. Therefore there are group leaders acting as intermediaries in producing additional private information about credit listings within groups. The intermediary realizes significant economies of scale in producing information for the marketplace.

Intermediaries can solve another information problem prevalent on electronic marketplaces. Borrowers might not be willing to disclose proprietary information to a large number of lenders in a public financial market. Following Bhattacharya / Chiesa (1995), an intermediary acts as facilitator of knowledge sharing whereby proprietary information is only disclosed vis-à-vis the intermediary.

On the marketplace, participants can voluntarily disclose additional private information regarding their credit listing. Within the group, borrowers may disclose proprietary information regarding their financial standing solely to the group leader. As group member, borrowers can thereby avoid disclosing private information to the marketplace. Group leaders assess and recommend borrower's credit quality based on additional private information, and at the same time preserve the privacy of proprietary information. Groups enable a better assessment of borrowers' credit quality, resulting in potentially lower rates for borrowers. This leads to:

> *Hypothesis H1: Group leaders reduce informational asymmetries through efficient review and assessment of credit listings within their group. Group membership leads to lower interest rates.*

With imperfect information on borrowers' credit quality lenders can use publicly observable signals to assess credit risk (Spence, 1973, Rothschild and Stiglitz, 1976, Riley, 1975). Observable characteristics or actions can serve as signals. On the electronic lending platform Prosper, recommendation of a credit listing through a group leader is a strong observable signal of credit quality. Borrowers can voluntarily provide additional private information regarding their financial standing to their group leader. Group leaders can then recommend credit

listings within their groups. The observable recommendation serves as a signal of good credit quality for the marketplace. This leads to:

Hypothesis H2: The recommendation of a credit listing by the group leader leads to lower interest rates.

The reliability of information produced by an intermediary is a prevalent problem in the intermediation literature. Group leaders might recommend credit listings within their group without prior diligent screening. It may be difficult or impossible for potential lenders to distinguish good information from bad. Group leaders can signal credibility of a recommendation by bidding in the recommended credit listing. The potential investment of the group leader is an observable signal for information quality (Leland and Pyle, 1976). We derive:

Hypothesis H3a: A group leader's bidding serves as a credible signal for the quality of the credit listing and results in lower interest rates.

Hypothesis H3b: A group leader's bidding on a credit listing signals information quality and has a stronger impact on interest rates than a recommendation by the group leader.

Past activities within a group, especially regarding the assessment of individual borrowers by the group leader, are only imperfectly observable. In contrast, the reputation of a group on the electronic marketplace is observable through a group rating. The group rating is a measurement of a group's performance in paying back its loans in comparison to expected (historical) default rates. A defaulted loan worsens a group's rating and thereby its reputation. The group rating implies a group's ability of assessing borrowers' credit quality. Tirole (1996) shows theoretically how a group's good reputation positively influences individual behaviour. We deduce:

Hypothesis H4: A good group rating leads to lower interest rates.

Herding behaviour on financial markets describes excessive collective behaviour where individual investment decisions are not based on adequate information but the behaviour of other market participants (Bikhchandani and Sharma, 2000). Herding might occur also on electronic capital markets. A bigger group within the marketplace might attract more investors resulting in increased bidding on credit listings within bigger groups. This leads to:

Hypothesis H5: The probability for herding behaviour during auctioning of a credit listing increases with group size. Increasing group size leads to lower interest rates.

Economic agents participating in capital markets are subject to self-selection (Alexander et al., 1997). Self-selection arises if those participating in an activity are systematically different from those who are not participating (Bjorklund and Moffitt, 1987). In financial transactions, self-selection arises due to different levels of financial literacy as well as characteristics of financial transactions (Alexander et al., 1997, Zumpano et al., 1996). Self-selection might be present on electronic marketplaces when individuals turning to intermediaries might differ significantly from those not using intermediary services. This could be the case if for example high risk borrowers would systematically turn to intermediaries when borrowing through electronic lending platforms. Also, transaction characteristics like loan amount might lead to self-selection towards using intermediary services. We conclude:

Hypothesis H6: Self-selection biases the usage of groups as intermediaries on electronic lending platforms.

4 Empirical Study

4.1 Methodology

We apply OLS regression analysis in order to determine the impact factors on the interest rate (as the outcome of the credit transactions on the market place) and test the hypotheses H1 until H5.

As a robustness test to control for a potential self-selection in the choice of an intermediary and in order to test hypothesis H6, we further apply the matching method explained in section 4.5. Econometric matching techniques were developed by Rosenbaum and Rubin (1983) and extended by Heckman and Robb (1985). The methods takes into account the fact that the characteristics of group member may differ significantly from non group members and ensures that such observed characteristics are not driving the results.

4.2 Dependent and Independent Variables

In our empirical analysis of intermediaries on an electronic P2P lending platform, the interest rates (after costs for intermediation services) measure how successful borrowers can access capital. Lower interest rates indicate better access to capital. The interest rates on Prosper should generally be interpreted with respect to market interest rates (de Bondt, 2005). As *dependent variable* we therefore analyze the *spread above the prime rate* (measured in basis points, i.e. a one-hundredth of one per cent) in order to control for differing market interest rates in our data.

To facilitate the testing of our hypotheses from chapter 3, we employ listing- and group-specific variables. We present an overview of our *independent variables* in table 2.

< *Table 2* >

In order to test hypothesis H1, H2, H3a and H3b we rely on the group-related variables *Group Affiliation*, *Certification*, *Group Leader Bid* and *Mandatory Review*. They measure the effect of group membership, a group leaders screening of potential borrowers, and the group leader's bid on a recommended loan listing. To be able to assess the usage of a paid intermediary we look at *Paid Group* as well as *Group Fee*. In order to evaluate the effect of a group's reputation we rely on the independent variable *Group Rating*. *Group Size* measures a potential herding effect hypothesized in hypothesis H5.

We incorporate a number of *control variables* into our analysis. First we look at four criteria based on individuals' credit reports commonly used by banks (Avery et al., 1996). *Credit Grade* and *Debt-to-Income (DTI) Grade* reflect repayment history as well as indebtedness and are provided by Prosper in cooperation with the credit reporting agency Experian. *Loan Amount* and *Homeownership* typically serve as additional risk characteristics.

We include two important transaction characteristics related to internet-based e-commerce. As self-disclosure may reduce uncertainty in electronic marketplaces (Tidwell and Walther, 2002), we control for *Visual Self Disclosure* in borrowers' loan listings with the provision of personal photographies. We include *Auction* as a control variable reflecting usage of the auction mechanism on Prosper as this may significantly influence price determination (Klemperer, 2004). Borrowers can choose the auction mechanism if they want to give lenders the chance to bid down the interest rate. Not using the auction mechanism will close a loan listing as soon the requested loan amount is met by bidders.

As it is well-known that consumers tend to adopt innovations in a process over a certain time (Olshavsky, 1980), there could be distortions in the database caused by consumers' hesitant use of intermediaries on the marketplace. Therefore we include *quarter* dummies into each regression model.

4.3 Description of data set

Our empirical analysis of financial intermediaries on the electronic P2P lending platform Prosper is based on 14,321 credit transactions between 2005-11 and 2007-09. 5,373 transactions involved the use of a paid intermediary. As of 2007-09-12 the marketplace consisted of a total of 385,161 registered users.

Our data set includes detailed information on these credit transactions and there is also comprehensive information on the course of the loan originating auction including individual bidding and its impact on interest rates. At this point in time the dataset is still heavily right censored with respect to subsequent information on ex post realized loan defaults. For this reason we adopt the borrowers' perspective and focus our analysis on the realized interest rates.

Table 3 presents descriptive statistics for loan amount and borrower rate by borrowers' credit grade as well as borrowers' group affiliation. Several interesting patterns emerge from this table.

< *Table 3* >

Out total sample of 14,321 loans 9,187 transactions were carried out by group members and 5,134 transactions without group affiliation. 58 percent of total group-affiliated borrowers were members of paid groups. We find borrowers of all credit grades in paid and unpaid groups as well as without group affiliation. Borrowers with the best credit grades AA, A and B were in relative terms more frequent in the sub sample of borrowers without group affiliation (40 percent versus 25 of all group-affiliated borrowers).

The average loan amount over the total sample was 6,102 USD. Borrowers with a better credit grade borrowed higher loan amounts. We see a mean loan amount in the total sample for borrowers with the best credit grade AA of 8,264 USD whereas for "high risk" borrowers (credit grade HR) only about one third of that. The average loan amount was higher for borrowers without group affiliation. However, when comparing by credit grades, we find higher average loan amounts for group members than for borrowers without group association. When comparing unpaid and paid groups, we find that borrowers with better credit grades borrowed significantly higher amounts in groups with a paid group leader that in unpaid groups.

Table 3 also lists the average borrower rate by credit grade as the spread over the prime rate. We see that the average spread was 10.11 percent. Comparing by credit grade we find that average spreads were lower for borrowers with group affiliation. Borrowers with credit grades of D, E and HR on average borrowed at a lower spread within groups than without group affiliation. Then again borrowers with top credit grades and without group affiliation borrowed at lower spreads than borrowers in paid groups.

To gain a better understanding of the patterns documented in table 3, we offer some further insights into the role of groups on the electronic lending platform in table 4.

< *Table 4* >

The first three rows in table 4 represent the distribution of variables based on individuals' credit reports by group membership. As already presented in table 3, the median credit grade of borrowers without group affiliation tends to be better. Group affiliated borrowers are on average more indebted which is reflected in the *Debt-to-Income* (*DTI*) *Grade*. We find an average *DTI* Grade of 40 percent within groups compared to 32 percent with transactions outside of groups. Within the sample, 41 percent of borrowers owned a house, and homeownership was more frequent in transactions outside of groups (45 percent). Average *Credit Grade* and *DTI Grade*, as well as the distribution of *Homeownership* seem to confirm the finding that borrowers with better risk characteristics are more frequent in the sub sample of borrowers without group affiliation.

Regarding characteristics of the transaction, we find that two out of three bidders within the sample disclose personal photographies (*Visual Self Disclosure*). This is far more often the case with transactions involving groups (71 vs. 55 percent). This corresponds with anecdotal evidence that group leaders often encourage group members to include personal pictures in their loan listings. Table 4 shows that 63 percent of all transactions within the sample made use of the auction mechanism of the marketplace. Borrowers with group affiliation use the auction mechanism more often (68 vs. 54 percent in transactions out of groups), and auctioned transactions are more frequent in paid groups. An auction enables lenders to bid down the interest rate and may lead to lower interest rates for borrowers. Not using the auction mechanism may accelerate the access to credit by potentially reducing the time until a loan is fully funded, since the loan listing is closed once the required loan amount is fully funded. Facing this trade-off, borrowers outside of groups decide to use the auction mechanism less often. There are two possible explanations for this finding. It could be that borrowers with better credit grades expect to benefit less from an auction of their loan listing. As an alternative explanation, group leaders might encourage borrowers to make use of the auction mechanism.

Table 4 further presents the distribution of five group-related variables. Table 4 strongly indicates that group leaders create value by serving as intermediaries on the electronic marketplace in order to help overcome problems of asymmetric information. The majority (55 percent) of groups enforces a mandatory review process and commit to screening of every loan listing within a group. Yet there is evidence of important differences in the role of group leaders in unpaid and paid groups. We find that certification of screened loan listings as well as

group leaders' bidding is more frequent in paid groups. Group leaders assess and then observably signal borrower's credit quality through a certification in 36 percent of transactions in paid groups compared to 24 percent in unpaid groups. Furthermore, paid group leaders bid on more than every second recommended loan listings and thus credibly signal information quality. Comparing the average size of unpaid and paid groups we find that unpaid groups tend to be smaller, even though the difference (average 1,552 vs. 1,760 members) is not very large. Finally, table 4 presents the average costs inherent with the choice of a paid intermediary. The average fee that group leaders impose amounts to 110 basis points or about one additional percentage point of interest for the borrower. From univariate analysis it is not possible to draw conclusions on the net value creation of a (paid) intermediary. In a next step we analyze the role of intermediation on the electronic marketplace in a multivariate set-up.

4.4 Empirical results

We present our analyses on the role of intermediation on the electronic lending platform in table 5. In three different regression models we look at the influence of (1) general group membership, (2) the usage of a paid group, and (3) the hypothesized functions of the intermediary on borrowers' credit conditions. Several interesting patterns emerge.

< *Table 5* >

The results from regression models (1) regarding Group Affiliation as well as from model (3) regarding the group-specific variables confirm our fundamental hypothesis H1: the use of an intermediary on the electronic marketplace significantly lowers borrowers' interest rates. Group affiliation ceteris paribus lowers the credit spread by 24 basis points. In regression model (2) and (3) we shed more light on the function and value creation of the intermediary.

Should borrowers always make demand on intermediary services? Regression model (2) confirms that the choice of the intermediary matters: the choice of a paid intermediary (*Paid Group*) increases the credit spread for borrowers by 84 basis points. From a borrower's point of view, the fee associated with usage of a paid group makes the loan more expensive. However, the analysis from the borrowers' perspective does not evaluate the intermediary's role in overall access to credit or the long run performance of the originated loan. In model (3) we analyse in greater detail how the intermediary creates value for the borrower.

All group-specific variables in regression model (3) have significant impact on credit spreads. The variables *Certification* and *Group Leader Bid* in regression model (3) significantly reduce borrowers' interest rates. Hypotheses H2 and H3a cannot be rejected: an important function of the intermediary is the screening of a potential borrower. The intermediary may then recommend the borrower's credit listing. There is further evidence for the hypothesized value creation by the intermediary: we find significant lower credit spreads in groups where group leader committed to screen every potential borrower (*Mandatory Review*).

Regression model (3) also shows that "actions speak louder than words": the group leader's bid on the borrower's credit listing exerts a significant stronger impact on borrowers' credit conditions than a recommendation. We can confirm Hypothesis H3b: the regression coefficient of *Group Leader Bid* excels *Certification*.

We find that a group's reputation serves as a proxy for the future diligent assessment of borrowers by the group leader. Lenders seem to bid down the interest rate in groups with a good reputation resulting in lower credit spreads for borrowers. Hypothesis 4 cannot be rejected as a group's reputation (*Group Rating*) significantly lowers interest rates.

Table 5 further shows evidence for the negative effect of group size on interest rates. This finding seems to indicate herding behaviour on the electronic marketplace and confirms our hypothesis H5. Increased bidding activity through herding behaviour seems to drive down interest rates in bigger groups.

Overall, our results show that even though the electronic P2P lending platform leads to disintermediation by enabling direct brokerage of loans between borrowers and lenders, a new type of financial intermediary emerges. Market participants become group leaders and provide intermediary services, reducing information asymmetries prevalent on the electronic marketplace. The intermediary primarily creates value by screening potential borrowers. This finding is supported by the significant reduction of borrowers' credit spread by mandatory screening process as well as the intermediary's recommendation of a borrower (*Certification*). Moreover, bidding on the screened borrower's credit listing has an even stronger impact on the resulting interest rate. Given a mandatory screening process, the recommendation of a borrower and the group leader's bid on the recommended loan listing, the credit spread will ceteris paribus be 164 basis points lower. This more than compensates the average required fee of 110 basis points (as shown in section 4.3).

These results are stable controlling for borrowers' credit history as well as transaction characteristics. In all three regression models we find that the control variables based on individual credit reports significantly

influence credit conditions, and that a borrower's *Credit Grade* has the strongest impact. In model (1) for example we find that ceteris paribus a decline in credit grade by one grade is associated with an average of 280 basis points increase in credit spread. Increasing indebtedness (*DTI Grade*) or a higher loan amount (*Amount*) significantly increases credit spread. Interestingly, we cannot find significant impact of home ownership. We further control for usage of the auction mechanism (*Auction*) and self disclosure (*Visual Self Disclosure*) and find a significant and negative impact on credit spreads.

4.5 Self selection bias

The evaluation of an intermediary's impact is complicated due to the potential existence of a self selection bias. Insights from practice induce that especially borrowers with a weak market access, i.e. a bad credit history resulting in a low credit score, use group membership as mitigation. This results in a more complicated evaluation of the success of an intermediary and interferes with the identification of the actual impact factors on the interest rate.

One possibility to ease the problem lies in the matching method (Rubin and Waterman, 2006), by which one can construct pairs of comparable credit transactions with and without using intermediaries. Pairs are selected from both groups that do not differ in their relevant characteristics, i.e. they are identical („statistical twins") or close to. It is most relevant for building the pairs that the characteristics are linked with the relevant measure determining the outcome of the credit transaction. Due to the similarity of the pairs with and without using intermediaries one can assume that the self selection bias can be excluded from the analysis.

As there are usually a lot of explanatory variables on interest rates (Avery et al., 2004) , we need to find adequate matching partners by several variables. This is also a multi-dimensional problem, complicating the search for adequate partners for every credit transaction. As a solution, Rosenbaum/Rubin (1983) propose the use of a balancing score, i.e. a function of all relevant characteristics. The matching partners selected are similar with respect to that balancing score. The propensity score, as a special balancing score, equals the probability of using a group as an intermediary. The propensity score is usually determined with Logit or Probit models (Titus, 2007).

When constructing matching pairs, all relevant characteristics of the customer are implicitly taken into consideration by the propensity score. Therefore, when searching for the matching partner, one has to consider only one dimension in terms of the propensity score (D'Agostino, 1998). The multi-dimensional problem of

searching an adequate matching partner is thereby reduced to a one-dimensional problem. An in-depth discussion of the method as well as adequate searching algorithms is provided by Gensler et al. (2005) and Titus (2007), the method has recently established in finance research (e.g. Drucker and Puri, 2005).

Table 6 presents our estimates for the matched sample in comparison to the estimated regression models with the total sample. We present the corresponding three models from table 5.

< *Table 6*>

Controlling for self selection, all regression model estimations remain largely unchanged and significant. We do not find support for a self-selection bias in the usage of intermediary services on the electronic credit marketplace. Hence, we cannot support hypothesis H6.

5 Conclusions

This paper presents new empirical evidence on electronic markets and disintermediation. We analyze the role of intermediaries on the American electronic P2P lending platform Prosper.

Prior literature provides arguments in favour of disintermediation due to the increasing role of electronic markets. Our analysis of an electronic credit lending platform provides differentiated results: we find that there are participants on the electronic marketplace acting as financial intermediaries, and that intermediation services significantly improve borrowers' credit conditions.

As suggested by traditional intermediation theory, the intermediary creates value by reducing information asymmetries between borrowers and lenders. We document the positive impact of the intermediary's screening activities. Based on superior private information, the recommendation of a credit listing significantly improves borrowers' credit conditions. Moreover, the intermediary's bid has an even stronger impact on the resulting interest rate. Our results indicate that intermediation costs could be more than compensated by lower interest margins for borrowers. Our results indicate that borrowers should also consider the intermediary's reputation. These results are robust to self-selection regarding the choice of an intermediary as well as other control variables relevant to the electronic lending platform. Based on our analysis, one can quantify the effect of each possible listing feature on the credit spread.

Our results contribute to the existing literature on disintermediation electronic markets and yield some interesting implications for the setup of online credit lending platforms and the behaviour of its participants.

However, the deduction of broad conclusions from our study is limited in so far as we focus on the impact of intermediation on borrowers' credit conditions mainly. It would be interesting to include ex post realized loan defaults into further analysis. Also, our data sample consists of consumer credit transactions on an American marketplace. Generalization to potential electronic markets for corporate or governmental debt, to other electronic markets, and to markets in other countries may provide interesting avenues for future research.

References

Akerlof, G. A. (1970) 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism'. *The Quarterly Journal of Economics*, 84**:** pp. 488-500.

Alexander, G. J., Jones, J. D. and Nigro, P. J. (1997) 'Investor Self-Selection: Evidence from a Mutual Fund Survey'. *Managerial & Decision Economics*, 18**:** pp. 719-729.

Allen, F. and Santomero, A. M. (1997) 'The Theory of Financial Intermediation'. *Journal of Banking and Finance*, 21**:** pp. 1461-85.

Allen, F. and Santomero, A. M. (2001) 'What do financial intermediaries do?' *Journal of Banking and Finance*, 25**:** pp. 271-294.

Avery, R. B., Bostic, R. W., Calem, P. S. and Canner, G. B. (1996) 'Credit Risk, Credit Scoring and the Performance of Home Mortgages'. *Federal Reserve Bulletin*, 82**:** pp. 621-648.

Avery, R. B., Bostic, R. W., Calem, P. S. and Canner, G. B. (2003) 'An Overview of Consumer Data and Credit Reporting'. *Federal Reserve Bulletin*, 89**:** pp. 47-73.

Avery, R. B., Calem, P. S. and Canner, G. B. (2004) 'Consumer credit scoring: Do situational circumstances matter?' *Journal of Banking & Finance*, 28**:** pp. 835-856.

Bakos, J. Y. (1991) 'A Strategic Analysis of Electronic Marketplaces'. *MIS Quarterly*, 15**:** pp. 295-310.

Bakos, Y. J. (1998) 'The Emerging Role of Electronic Marketplaces on the Internet'. *Communications of the ACM*, 41**:** pp. 35-42.

Benjamin, R. and Wigand, R. (1995) 'Electronic Markets and Virtual Value Chains on the Information Superhighway'. *Sloan Management Review* 36**:** pp. 62-72.

Bhattacharya, S. and Chiesa, G. (1995) 'Proprietary Information, Financial Intermediation, and Research Incentives'. *Journal of Financial Intermediation*, 4**:** pp. 328-357.

Bhattacharya, S. and Thakor, A. V. (1993) 'Contemporary Banking Theory'. *Journal of Financial Intermediation*, 3**:** pp. 2-50.

Bikhchandani, S. and Sharma, S. (2000) 'Herd Behavior in Financial Markets'. *IMF Staff Papers*, 47**:** pp. 279-310.

Bjorklund, A. and Moffitt, R. (1987) 'The Estimation of Wage Gains and Welfare Gains in Self-Selection Models'. *The Review of Economics and Statistics*, 69**:** pp. 42-49.

Chircu, A. M. and Kauffman, R. J. (2000) 'Reintermediation strategies in business-to-business electronic commerce'. *International Journal of Electronic Commerce*, 4**:** pp. 7-42.

Cordella, A. A. C. (2006) 'Transaction costs and information systems: does IT add up?' *Journal of Information Technology*, 21**:** pp. 195-202.

D'agostino, R. B. (1998) 'Propensity score methods for bias reduction in the comparison of a treatment to a non-randomized control group'. *Statistics in Medicine*, 17**:** pp. 2265-2281.

De Bondt, G. J. (2005) 'Interest Rate Pass-Through: Empirical Results for the Euro Area'. *German Economic Review*, 6**:** pp. 37-78.

Dewatripont, M. and Tirole, J. (1994) *The Prudential Regulation of Banks*, Cambridge, MA: MIT Press.

Diamond, D. W. (1984) 'Financial Intermediation and Delegated Monitoring'. *The Review of Economic Studies*, 51**:** pp. 393-414.

Drucker, S. and Puri, M. (2005) 'On the Benefits of Concurrent Lending and Underwriting'. *The Journal of Finance*, 60**:** pp. 2763–2799.

Evans, P. B. and Wurster, T. S. (1997) 'Strategy and the New Economics of Information'. *Harvard Business Review*, 75**:** pp. 70-82.

Gartner Inc. (2008) ‘Gartner Says Social Banking Platforms Threaten Traditional Banks for Control of Financial Relationships', accessed 2008-02-26.

Gensler, S., Skiera, B. and Böhm, M. (2005) 'Einsatzmöglichkeiten der Matching Methode zur Berücksichtigung von Selbstselektion'. *Journal für Betriebswirtschaft*, 55**:** pp. 37-62.

Grieger, M. (2003) 'Electronic marketplaces: A literature review and a call for supply chain management research'. *European Journal of Operational Research*, 144**:** pp. 280-294.

Hagel, J. and Singer, M. (1999) *Net worth: shaping markets when customers make the rules*, Boston: Harvard Business School Press.

Heckman, J. J. and Robb Jr, R. (1985) 'Alternative Methods for Evaluating the Impact of Interventions'. *Journal of Econometrics*, 30**:** pp. 239-267.

Hulme, M. K. and Wright, C. (2006) ‘Internet Based Social Lending: Past, Present and Future', London, Social Futures Observatory.

Klemperer, P. (2004) *Auctions : theory and practice*, Princeton: Princeton Univ. Press.

Leland, H. E. and Pyle, D. H. (1976) 'Informational Asymmetries, Financial Structure, and Financial Intermediation'. *The Journal of Finance*, 32**:** pp. 371-387.

Malone, T. W., Yates, J. and Benjamin, R. I. (1987) 'Electronic Markets and Electronic Hierarchies'. *Communications of the ACM*, 30**:** pp. 484-497.

Malone, T. W., Yates, J. and Benjamin, R. I. (1989) 'The Logic of Electronic Markets'. *Harvard Business Review*, 37**:** pp. 166-170.

Methlie, L. B. and Pedersen, P. E. (2002) A Taxonomy of Intermediary Integration Strategies in Online Markets. *15th Bled Electronic Commerce Conference.*

Meyer, T. (2007) ‘The power of people : Online P2P lending nibbles at banks' loan business', *E-Banking Snapshot 22.* Frankfurt, Deutsche Bank Research.

Mitschke, U. (2007) '"Kreditauktionen" im Internet und die bankaufsichtsrechtliche Erlaubnispflicht der Beteiligten'. *BaFinJournal: Mitteilungen der Bundesanstalt für Finanzdienstleistungsaufsicht BaFin,* 5**:** pp. 3-5.

Nellis, J. G., Mccaffery, K. M. and Hutchinson, R. W. (2000) 'Strategic challenges for the European banking industry in the new millennium'. *International Journal of Bank Marketing,* 18**:** pp. 53-64.

Prosper Marketplace Inc. (2007) ‘What's New on Prosper?' http://www.prosper.com/help/topics/whats_new.aspx, accessed 31 January 2008.

Riley, J. G. (1975) 'Competitive Signalling'. *Journal of Economic Theory,* 10**:** pp. 174-86.

Rosenbaum, P. R. and Rubin, D. B. (1983) 'The central role of the propensity score in observational studies for causal effects'. *Biometrika,* 70**:** pp. 41-55.

Rothschild, M. and Stiglitz, J. (1976) 'Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information'. *The Quarterly Journal of Economics,* 90**:** pp. 629-649.

Rubin, D. B. and Waterman, R. R. (2006) 'Estimating Causality via Propensity Scores - Estimating the Causal Effects of Marketing Interventions Using Propensity Score Methodology'. *Statistical science,* 21**:** pp. 206-222.

Santomero, A. M. (1984) 'Modeling the Banking Firm: A Survey'. *Journal of Money, Credit and Banking,* 16**:** pp. 576-602.

Sarkar, M., Butler, B. and Steinfield, C. (1998) 'Cybermediaries in Electronic Marketspace: Toward Theory Building'. *Journal of Business Research,* 41**:** pp. 215-221.

Schmidt, R. H., Hackethal, A. and Tyrell, M. (1999) 'Disintermediation and the Role of Banks in Europe : An International Comparison'. *Journal of Financial Intermediation,* 8**:** pp. 36-67.

Segev, A., Gebauer, J. and Farber, F. (1999) 'Internet-based Electronic Markets'. *Electronic Markets,* 9**:** pp. 138-146.

Sen, R. and King, R. C. (2003) 'Revisit the Debate on Intermediation, Disintermediation and Reintermediation due to E-commerce'. *Electronic Markets,* 13**:** pp. 153 - 162.

Spence, M. (1973) 'Job Market Signaling'. *The Quarterly Journal of Economics,* 87**:** pp. 355-374.

Tidwell, L. C. and Walther, J. B. (2002) 'Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations: Getting to know one another a bit at a time'. *Human Communication Research,* 28**:** pp. 317-348.

Tirole, J. (1996) 'A Theory of Collective Reputations (with applications to the persistence of corruptions and to firm quality)'. *Review of Economic Studies,* 63**:** pp. 1-22.

Titus, M. (2007) 'Detecting selection bias, using propensity score matching, and estimating treatment effects: an application to the private returns to a master’s degree'. *Research in Higher Education,* 48**:** pp. 487-521.

Zumpano, L. V., Elder, H. W. and Baryla, E. A. (1996) 'Buying a house and the decision to use a real estate broker'. *The Journal of Real Estate Finance and Economics,* 13**:** pp. 169-181.

Table 1: Overview electronic P2P lending platforms

Provider	**Prosper Marketplaces, Inc.**	**Zopa Ltd.**	**Smava GmbH**
URL	www.prosper.com	www.zopa.co.uk	www.smava.de
Market	USA	UK, USA planned	Germany
Members	484,037*	150,000**	25,000***
Cooperating Credit Reporting Agency	Experian	Equifax	Schufa
Loan Processing Bank	Wells Fargo, Inc.	The Royal Bank of Scotland plc	biw Bank für Investments und Wertpapiere AG
Maximum Amount	25,000 USD	25,000 USD	10,000 EUR
Pricing of Loans	Second Price Auction / Determined by BR	Second Price Auction	Determined by BR
Fee (% of LA)	BR initial 1%-2%; LN annual 0.5%-1% of LA outstanding	BR initial 0.5%; LN initial 0.5%	BR initial 1%

* As of 2007-12-31; ** As of 2007-08-15; *** As of 2008-01-18 BR = Borrower; LN = Lender; LA = Loan Amount

Table 2: Description of independent variables

Variable	Description
CREDIT GRADE	Assessment of credit provided by credit reporting agency Experian.Credit grades assigned are AA,A,B,C,D,E and HR.
AMOUNT	Loan amount.
DTI GRADE	Debt to income ratio based on credit report and self-reported annual income.
VISUAL SELF DISCLOSURE	Dummy variable equal 1 (0 if otherwise) if borrowers included at least one picture in loan listing.
HOMEOWNERSHIP	Dummy variable equal 1 (0 if otherwise) if borrower is home owner.
AUCTION	Dummy variable equal 1 (0 if otherwise) if loan listing in "auction" format. Allows for bidding on interest rate.
GROUP AFFILIATION	Dummy variable equal 1 (0 if otherwise) if borrower is member of a group.
PAID GROUP	Dummy variable equal 1 (0 if otherwise) if borrower is member of a group that imposes a fee.
GROUP RATING	Group's historic repayment performance against expected (historical) default rates. Rating from 1 to 5 stars.
CERTIFICATION	Dummy variable equal 1 (0 if otherwise) if group leader recommends a credit listing within the group.
GROUP LEADER BID	Dummy variable equal 1 (0 if otherwise) if group leader bid on loan listing.
GROUP FEE	Optional fee group leader can impose as additional percentage of interest.
GROUP SIZE	Number of group members at the time of loan listing.
MANDATORY REVIEW	Dummy variable equal 1 (0 if otherwise) if a group's loan listings require approvement by the group leader.

Table 3: Descriptive Statistics for Loan Amount and Borrower Rate

		Total Sample	***No Group (36%)***	***Group Members (64%)***		
	Credit Grade			*Total*	*Paid Group*	*Unpaid Group*
Mean (Median) Loan Amount	AA	8,264 (5,000)	7,924 (5,000)	8,624 (6,000)	10,321 (8,500)	7,181 (5,000)
	A	9,170 (7,000)	8,431 (6,000)	9,835 (8,000)	10,089 (8,100)	9,466 (7,000)
	B	8,681 (7,000)	8,172 (6,000)	9,057 (7,500)	9,596 (8,000)	8,157 (6,100)
	C	7,143 (5,100)	6,402 (5,000)	7,588 (6,000)	7,877 (6,500)	7,104 (5,000)
	D	5,630 (4,750)	5,045 (4,000)	5,952 (5,000)	6,228 (5,000)	5,454 (4,500)
	E	3,917 (3,000)	3,897 (3,000)	3,926 (3,000)	3,965 (3,100)	3,872 (3,000)
	HR	2,629 (2,500)	2,616 (2,500)	2,632 (2,500)	2,625 (2,500)	2,641 (2,500)
	Total	*6,102 (4,000)*	*6,226 (4,300)*	*6,033 (4,000)*	*6,406 (4,800)*	*5,506 (3,500)*
Borrower Rate: Mean (Median) Spread over Prime Rate	AA	130 (64)	123 (54)	137 (74)	233 (175)	55 (0)
	A	340 (275)	341 (265)	339 (284)	384 (322)	274 (224)
	B	605 (553)	611 (555)	601 (542)	662 (605)	499 (445)
	C	891 (805)	928 (875)	868 (775)	943 (870)	743 (675)
	D	1,205 (1175)	1,297 (1,280)	1,154 (1,125)	1,212 (1,175)	1,051 (990)
	E	1,591 (1600)	1,701 (1,819)	1,545 (1,575)	1,584 (1,575)	1,492 (1,575)
	HR	1,604 (1675)	1,667 (1,975)	1,589 (1,670)	1,635 (1,670)	1,537 (1,675)
	Total	*1,011 (975)*	*922 (825)*	*1,060 (1,025)*	*1,116 (1,110)*	*981 (875)*
Absolute (relative) number of transactions	AA	1,472 (10)	756 (14)	716 (7)	329 (6)	387 (10)
	A	1,363 (9)	645 (12)	718 (7)	425 (7)	293 (7)
	B	1,768 (12)	751 (14)	1,017 (11)	636 (11)	381 (9)
	C	2,494 (17)	937 (18)	1,557 (16)	975 (18)	582 (15)
	D	2,592 (18)	920 (17)	1,672 (18)	1,075 (20)	597 (15)
	E	2,167 (15)	638 (12)	1,529 (16)	885 (16)	644 (16)
	HR	2,465 (17)	487 (9)	1,978 (21)	1,048 (19)	930 (24)
	Total	*14,321 (100)*	*5,134 (100)*	*9,187 (100)*	*5,373 (100)*	*3,814 (100)*
	% AA,A,B	31	40	25	24	26
	% D,E,HR	50	38	55	55	55

Table 4: Descriptive Statistics for independent variables

	Total Sample	***No Group***	***Group Members***		
			Total	*Unpaid Group*	*Paid Group*
Observations	*14,321*	*5,134*	*9,187*	*3,814*	*5,373*
CREDIT GRADE: Median	D	C	D	D	D
DTI GRADE: Mean (Median)	37% (18%)	32% (17%)	40% (19%)	38% (17%)	43% (17%)
HOMEOWNERSHIP	40.9%	45.4%	38.3%	36.4%	39.7%
VISUAL SELF DISCLOSURE	65.4%	54.7%	71.4%	69.7%	72.7%
AUCTION	63.2%	54.3%	68.1%	63.5%	71.3%
MANDATORY REVIEW			55.3%	54.7%	55.7%
CERTIFICATION			30.8%	23.7%	35.8%
GROUP LEADER BID			48.3%	38.5%	55.3%
GROUP SIZE: Mean (Median)			1,677 (433)	1,552 (316)	1,760 (458)
GROUP FEE: Mean Basis Points					109.7

Table 5: Effect of intermediation and characteristics of the transaction

	(1)	(2)	(3)
Variable	Spread (Prime Rate)		
INTERCEPT	-136.316	-133.150	-76.677
	(-10.123)***	(-9.950)***	(-3.774)***
CREDIT GRADE	279.363	273.500	266.723
	0.810	*0.793*	*0.783*
	(139.564)***	(139.220)***	(98.288)***
AMOUNT	0.025	0.025	0.027
	0.218	*0.211*	*0.236*
	(40.704)***	(39.605)***	(33.025)***
DTI GRADE	22.362	20.973	27.375
	0.041	*0.039*	*0.057*
	(8.557)***	(8.071)***	(9.111)***
VISUAL SELF DISCLOSURE	-61.651	-71.476	-58.803
	-0.045	*-0.052*	*-0.042*
	(-9.036)***	(-10.594)***	(-6.657)***
HOMEOWNERSHIP	-4.393	-6.368	-22.410
	-0.003	*-0.005*	*-0.017*
	(-0.637)	(-0.929)	(-2.615)***
AUCTION	-289.492	-308.577	-242.295
	-0.213	*-0.227*	*-0.179*
	(-41.553)***	(-44.674)***	(-26.356)***
GROUP AFFILIATION	-24.294		
	-0.018		
	(-3.503)***		
PAID GROUP		84.410	
		0.063	
		(12.633)***	
GROUP RATING			-25.407
			-0.048
			(-7.394)***
CERTIFICATION			-19.819
			-0.015
			(-1.860)*
GROUP LEADER BID			-68.741
			-0.055
			(-7.341)***
GROUP FEE			1.049
			0.134
			(19.380)***
GROUP SIZE			-0.014
			-0.056
			(-7.040)***
MANDATORY REVIEW			-51.954
			-0.041
			(-4.891)***
N	14,335	14,335	14,335
Prob > F	0	0	0
R^2	0.684	0.687	0.684
Adj. R^2	0.684	0.687	0.683

Reported are regression coefficients and standardized coefficients in italics, t-ratios in parenthesis.
*** Indicates significance at 1%.** Indicates significance at 5%. * Indicates significance at 10%.

Table 6: Propensity score matching

	(1)		(2)		(3)	
	Total Sample	**Matched Sample**	**Total Sample**	**Matched Sample**	**Total Sample**	**Matched Sample**
Variable	Spread (Prime Rate)					
INTERCEPT	-136.316	-120.867	-133.150	-126.508	-76.677	-76.682
	(-10.123)***	(-7.686)***	(-9.950)***	(-8.106)***	(-3.774)***	(-3.289)***
CREDIT GRADE	279.363	275.828	273.500	271.752	266.723	256.998
	0.810	*0.795*	*0.793*	*0.784*	*0.783*	*0.777*
	(139.564)***	(117.131)***	(139.220)***	(117.609)***	(98.288)***	(84.245)***
AMOUNT	0.025	0.026	0.025	0.025	0.027	0.028
	0.218	*0.221*	*0.211*	*0.215*	*0.236*	*0.242*
	(40.704)***	(35.541)***	(39.605)***	(34.771)***	(33.025)***	(29.505)***
DTI GRADE	22.362	24.947	20.973	23.988	27.375	30.146
	0.041	*0.047*	*0.039*	*0.045*	*0.057*	*0.062*
	(8.557)***	(8.212)***	(8.071)***	(7.931)***	(9.111)***	(8.596)***
VISUAL SELF DISCLOSURE	-61.651	-69.163	-71.476	-75.797	-58.803	-67.546
	-0.045	*-0.051*	*-0.052*	*-0.056*	*-0.042*	*-0.050*
	(-9.036)***	(-8.830)***	(-10.594)***	(-9.779)***	(-6.657)***	(-6.811)***
HOMEOWNERSHIP	-4.393	-9.618	-6.368	-11.203	-22.410	-29.477
	-0.003	*-0.007*	*-0.005*	*-0.008*	*-0.017*	*-0.023*
	(-0.637)	(-1.191	(-0.929)	(-1.393)	(-2.615)***	(-2.949)***
AUCTION	-289.492	-293.646	-308.577	-305.707	-242.295	-253.319
	-0.213	*-0.218*	*-0.227*	*-0.227*	*-0.179*	*-0.189*
	(-41.553)***	(-35.980)***	(-44.674)***	(-37.831)***	(-26.356)***	(-24.011)***
GROUP AFFILIATION	-24.294	-16.671				
	-0.018	-0.012				
	(-3.503)***	(-2.050)**				
PAID GROUP			84.410	70.617		
			0.063	*0.053*		
			(12.633)***	(9.157)***		
GROUP RATING					-25.407	-22.118
					-0.048	*-0.041*
					(-7.394)***	(-5.431)***
CERTIFICATION					-19.819	-23.376
					-0.015	*-0.017*
					(-1.860)*	(-1.864)*
GROUP LEADER BID					-68.741	-67.531
					-0.055	*-0.053*
					(-7.341)***	(-6.197)***
GROUP FEE					1.049	0.962
					0.134	*0.117*
					(19.380)***	(14.796)***
GROUP SIZE					-0.014	-0.012
					-0.056	*-0.049*
					(-7.040)***	(-5.443)***
MANDATORY REVIEW					-51.954	-33.451
					-0.041	*-0.026*
					(-4.891)***	(-2.731)***
N	14,335	10,090	14,335	10,090	14,335	10,090
Prob > F	0	0	0	0	0	0
R^2	0.684	0.695	0.687	0.698	0.684	0.703
Adj. R^2	0.684	0.695	0.687	0.698	0.683	0.702

Reported are regression coefficients and standardized coefficients in italics, t-ratios in parenthesis.
*** Indicates significance at 1%.** Indicates significance at 5%. * Indicates significance at 10%.