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Microfinance and Family Ties: Challenge to Reduce the Loan Default in Urban Area in Thailand

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Abstract

Due to differences in the social structure of urban areas and rurals area, the group lending efficiency in both societies are different. Group lending with family ties can help reduce problems caused by weak social bondage among group members including the moral hazard problem in low income group lending. In the methodology, this study will test the repayment rate of group lending through the method of a field experiment game. The experiment subjects will be divided into 3 groups: 1) Random matching group 2) Self-selected group and 3) Family ties group. When the experiment ends, individual information will be collected and the results will be tested using an Ordered Logit Model. The conclusion of the research is that in urban areas the group lending with family ties gives a good outcome with a high efficiency of repayment rate, compared to the rate of repayment in random matching group lending and self-selected group lending. When considering the effect of shocks to the loan default, we found out that the family ties group is the most effective type to transfer the shock among group members. Therefore, the family ties group can be more sensitive with loan default and tends to have higher chances of group loan default under shock.

Keywords: Microfinance, Family Ties, Field Experiment Game

1. Introduction

The microfinance system has evolved over the years since 1980, when the Grameen Bank of Bangladesh was set up to provide financial assistance to low income people who could not access the credit from the formal financial sector in the economy. One main reason that normal banks are not able to lend a support to the low-income target group is that the low-income group cannot provide any collateral for the loan guarantee.

To reduce the problem of investing collateral in the low income group, Grameen bank has created a group lending program to help low income borrower access the investment fund under the condition that members must share loan burden. The group lending will apply the concept of joint liability which will reduce "Adverse Selection" (Ghatak (1999) and Abbink et al. (2006)) and "Moral Hazard" (Stiglitz (1990), Besley and Coate (1995), (Aghion and Morduch, 2005) and Cason et al. (2011)) and adverse selection problem occurs when a financial institution does not have enough information to assort a low income group and a moral hazard problem happens when the borrower does not spend the loan as he declares to the financial institution.

To reduce the adverse selection problem, Ghatak (1999) used the benefit of local information because borrowers had more information about their group members and would choose another safe borrower as a new member for the group. To reduce the moral hazard problem, the commitment among people in the group's debt will automatically pressure people in group to monitor and track the investment behavior of each individual among the group member. Moral hazard problems can also occur in another form. Some members succeed in investment but they decide not to repay the debt (Strategic default) (Besley and Coate (1995)). In such cases, the lender might not have known whether the default of the borrower was intentional or the borrower was actually unable to earn enough money to pay back. Group lending can resolve this issue by the principles of the monitoring cost, with the assumption

that the group members know each other well and can monitor each other's behavior. This allows each member to keep track and know circumstances in the group. Therefore, each member of the group will be the one who reveals which reason the default were the causes (Aghion and Murdoch (2005)).

However, the success of the group lending often depends on the intimacy of the group. Differences in the levels of social cost such as the borrower's reputation in the community can reduce the efficiency of group lending (Hofferth and Iceland (2011)). In the weak social ties society, the condition of loan collateral in the group can lead to negative effect of group lending through free-riding problem.

Group lending can mislead high-risk individuals to loan default. This group lending will eventually have additional risk on individual (Fischer (2013)). In some cases, group lending can create negative welfare situations too. When one member has loan default, the intention to repay of other members in the group is reduced. Even though other members are still willing to repay some individual debts, the whole repayment rate is still lower than the total group loan which is still counted as default (Besley and Coate (1995)). Therefore, it comes to the question whether joint liability is still a good tool for microfinance loan when the relationship among members in the group is not strong.

In urban areas, the low income population is migrating from rural areas in order to look for opportunities. The migration creates heterogeneous communities with various racial, ethnic or even different income ranges. This kind of variety in society characteristics can reduce the trust between individuals in the society (Alesina and Ferrara (2000)). With very little bond between members in the society, the group usually makes decisions based on benefits they get. Therefore, the efficiency of group lending in the urban areas is not high when compared to group lending in rural areas (Agihon and Morduch (2005)).

To solve weak social ties problem in urban areas, this study chooses the benefit of family ties to strengthen the bond between each member in the group. Alesina and Ferrara (2000) found that each individual has more reliability if the partner shares similarity with them, for example, family

member's similarity. Ermisch and Gambetta (2008) found that people who come from families with strong family ties tend to trust strangers less than the ones who are from family with weaker family ties. Carrillo (2010) stated that family ties member characteristic help reduce the risk in investment.

Therefore, this study consider whether strong family ties can help solve group default problem in weak social ties since family members help monitor the behavior of each other in the family and also help punish the one that tends to free ride or avoid the repayment of the debt efficiently even in urban areas with weak social bondage.

2. Literature reviews

Regarding the effectiveness of debt repayment in group lending, Gomez and Santor (2003) found that group lending has more efficiency than the individual lending because of its relatively lower borrower default rates. On contrary, Kono (2006) who conducted a test on Vietnam low income group to study the efficiency of low income group lending. The study found that group lending with dynamic incentives condition causes the free riding problem that raise the chance of loan defaults. However, even peer monitoring and penalties among group members cannot solve the default problem. Therefore, individual lending gives a better result than the group lending, especially the result in the rate of loan default. Similar to Kono (2006), Gine et al. (2010) conducted a field experiment to test the efficiency of group lending in Peru. They found that group lending member tended to invest in more high-risk project. Bauer (2008) conducted a survey in South India and found that most of the low income member values the present amount of consumption than the expected amount of consumption in the future, which means the microfinance groups tends to choose to default loans over repaying their debts.

Many literatures employ experimental game to study group lending of microfinance to understand the importance of social ties and to determine the proper size of the group. Abbink (2006) found that group lending with high degrees of solidarity lead to high willingness to repay. This willingness to pay is unstable over time but still comparatively high when compared to other kind of group lending. Under the group lending scheme, Karlan (2005)

found that the closer the group member, the stronger the group tie. He tested the study by letting the borrowers group choose its own members as opposed to the group set up by the researcher. The results showed that those who were closer had a higher payback ratio, which were consistent with Ghatak (1999). In the proper size of the group lending, Abbink (2006) found that if the number of members was too high, a free riding could occur. Carrillo (2010) studied the relationship between Family ties and Social ties by using a field experiment. In conclusion, Carrillo found that without communication among members and with the enforcement the repayment, family ties group had less risky behavior than non-family ties group.

Some empirical studies found that socio-economic factors such as family size, distance from the fund source, total household income and total household expenditure can impact fund accessibility. Kevane and Wydick (2001) tested the differences in gender and found that female entrepreneurs are more likely to have difficulties to access to investment fund due to maternal duties and maternity leave. Moreover, Mokhtar et al. (2002) did the research on Microfinance project in Malaysia and found that gender, age, and repayment schedule has effect on the loan default. Bhatt and Tang (2002) found that education level has good relationship to repayment but no relationship shown between repayment rate and other factors such as gender, household income, or business type.

There are still not many studies about family ties, but family has an important role in the study of microfinance like in the work of Pearlman (2012), who conducted test the entrepreneurs in Peru and found that more than 60% of the sample group use informal networks to access fund, for example, borrowing from relatives or friends. They believe that this network can reduce negative shocks. Apart from that, Okten and Osili (2004) stated that borrower who seeks for loan, family and community networks is a good channel that provide effective and reliable loans. Yamagishi et al. (1998) found that people who come from families with strong family ties, tend to trust strangers less than the one who are from family with weaker family ties. In the term of monitoring and sanctioning, strong bond groups like family ties increase the chances of monitor and sanction than non-family ties group. In the study of Ahlin and Townsend (2006), the researcher found that low

income groups in Thailand with family-ties have inversely relationship to repayment ability because their strong bond decreases their ability to impose penalties.

From many literature reviews, we found that the success of group lending is based on the strength of the bond in the group. In the time when society gradually urbanizes, the bond between group decreases; therefore, group lending tends to be less effective. This research will study whether the family ties can strengthen the social bondage in case of low intimacy society or not.

3. Method

3.1 Data Collection

The definition of urban area in this study is the area in Muang District and the definition for rural area is the area outside Muang District. This study employs field experiment in five local morning markets. Four of which are located in difference areas in Bangkok, namely 1.Thon Buri Train Market 2.Bangkhea Market 3.Talad Thai Market 4.Wongwian Yai Market and the last one is located in the rural area, Bang RaKam district in Nakhon Pathom province will be used as the benchmark for the experiment in this study.

The sample groups are divided into 3 types of group in 2 areas (rural area and urban area). Group in rural society will be the benchmark to study the differences in repayment behavior among rural and urban areas. The characteristics of each group will be 1) Random matching group of 30 persons, 10 sub-groups with 3 members each where mongers in random matching groups will be picked randomly by the game moderator, 2) Self-selected group, 10 sub-groups with 3 members each. In the second group where subjects are asked to be grouped in three with people they know from the experiment, either coming from the same area or knowing each other before and we will call this type of group is self-selected group and 3) Family ties group, 10 sub-groups with 3 members each where members in the group must be related in some kind of family bond (such as parents, children and relatives). The experimental subjects in total will be 180 divided into 60 groups.

3.2 Field Experiment Game and Ordered Logistic Regression

Normally, when the questions about loan are asked, no sincere answer is given. For example, a subject may reply that there was no loan default. To avoid bias from the interview, we use an experimental game based on the experiment by Abbink (2006) to study the decision on loan default. After the field experiment ends, we also do Ordered Logit Model to study the factors that affect the loan default

3.3 Game Introduction

Before the game starts, the game moderator will explain how to play the game in details to all members. Questions about the game will be asked until every member truly understands the rule and how to play the game. To prevent the information from leaking in the group and talking with each other, one assistant moderator will bring one member in group to a different corner of the room and to prevent information bias problems, each assistant moderator will say and ask the questions following the script only. Each assistant game moderator is not allowed to say anything that is not written in the script. In total, the game will take 20 minutes and at the end, the game moderator will announce the value of the token. 100 Tokens will value as 5 Baht. At the end of the game, the maximum amount of money one member can earn is 365 Baht and the minimum is 0 Baht.

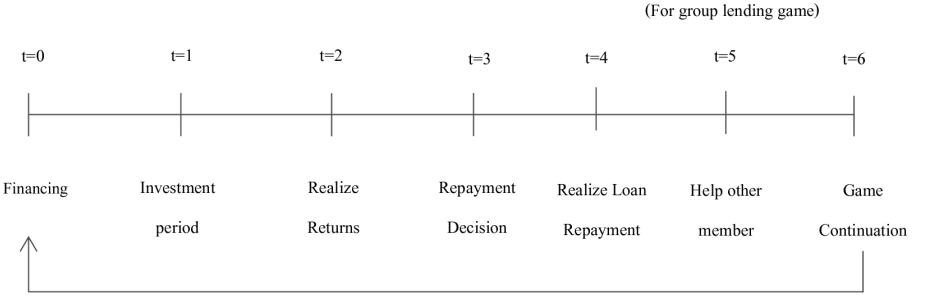
Each assistant moderator will pass the result of the member they are in charge of through an instant message tool in order to share the information to the other assistant moderators in the room. For example, if member no.1 failed the investment or loan default decision. The result will be passed to the second and third assistant moderator to ask for their financial help from the second and third members. However, the second and third members will not know each other's decision. All they will know is one of the members has financial problems.

3.4 Game Procedure

The structure of the game in this paper is developed from Abbink et al. (2006) where the game will be divided into 3 styles.1) Individual lending 2) Group lending game 3) Group lending game with shock.

3.4.1 Individual lending game and group lending game

Figure 1. Timing of Events



Individual lending game (Appendix A. for game answers sheet)

Stage 1: Game moderator will give each participant 300 Tokens as his/her the investment fund.

Stage 2: Game moderator will ask members to toss the dice to specify the investment result. If the dice turns out to be 4-6 (probability of ½), we will assume that the investors succeed and receive the investment return of 300 token but if the dice shows 1-3 (probability of ½), 300 tokens will be taken from the investor.

Stage 3: Each member finds out the result.

Stage 4: Game moderator will ask each member whether they willing to repay the debt or not.

Stage 5: Member will be asked to confirm their repayment decision. If the member decides to repay the debt to the game moderator, they can continue to invest in the next round. However, if they decide to make loan default, the game will stop.

Group lending game

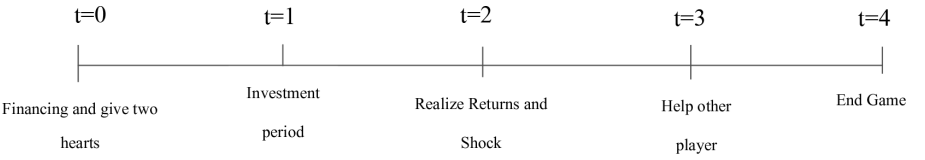
Once the members have already participated in individual lending, each member will start the group lending game. Each member will form a group according to the form provided by the game (Random Matching group,

Self-selected group and Family ties group). For Stage 1 - Stage 5, the process of group lending game is identical to the same that of individual lending game.

Stage 6: After every member repay the debt, the game moderator must count the total repayment and it must equal to 900 tokens (300 for each member). If the total token is fewer than 900 tokens, moderator will ask each member to help other members who failed their investment. In the search for help, each member will not know which member in the group is the one who did not repay the debt but will only know that the total repayment is fewer than 900 tokens. Therefore, no one in the group will know other members' decision whether they will help repay the leftover debt or not. In particular, the group lending can collect 900 token to repay the moderator, the whole group will have a chance to go for the next round. Otherwise the game will stop.

3.4.2 Group lending game with shock

Figure 2. Timing of Events



Stage 1: Game Moderator will give each member 300 Tokens and 2 hearts. Each heart is worth 500 token.

Stage 2: Each member will choose one card from 3 cards.

Stage 3: The result of the investment will be announced. 2 out of 3 cards has the following message written on them "your investment is successful and you will receive 300 Tokens" and one of the 3 cards, "you lose 300 Tokens and 2 hearts".

Stage 4: The member that succeeds in the investment will be informed that "one of the member in the group loss the investment money along with the 2 hearts" and his/her will be asked for his decision after the hearing.

This game will be played only one round. However, to reduce the loan default decision, in the case that the member knows that there will be only one round, moderator will not let any members know the number of rounds in the game. There will be more additional conditions to play in the game with shock. These conditions are:

1) When the game ends and the member holds 2 hearts, he/she will receive the return on investment plus 500 Tokens for each heart left.

2) When the game ends and the member has 1 heart left, he/she will not receive any return on investment but receive 500 Tokens for a heart instead.

3) When the game ends but the member has no heart left, he/she will not receive anything.

3.4.2.1 Assistance conditions

In the form of the game with shock, if a member requests any assistance after loss of heart, the assistance can be provided in 2 ways, 1) They can assist with the tokens they hold or 2) with the hearts they possess. They can choose only one style. Tokens together with heart are not allowed.

If they choose the way first option, the whole group except the member with shock can continue to the next round the investment. If they choose second option, the member with shock will finally gain token as the amount of heart they receive, but the whole group's investment chance in the next round will become zero and the group cannot continue its future investment because it cannot repay the debt to the lender.

3.5 Ordered Logistic Regression Analysis

After the field experiment ends, each member will complete the information on the survey: demography variables and family variables as shown in Appendix B. To test the effects of all control variables on debt default, this study applies a different approach on the dependent variable to eradicate some behaviors that affect the repayment decision but cannot be easily observed; for example, personalities, life styles, characters or attitudes. The dependent variable data are transformed from the period that each member in group decide to default in group lending game minus period that the individual decides to default in the individual lending game and we get a new dependent variable in the form of the changes in debt repayment after

group lending is formed. After the inquiry is completed, all data will be used to testing the Ordered Logit Model. (Appendix B. for description of variables)

$$Y = \beta_1 \mathbf{X}_{\text{Re } mit \text{ tan } ce} + \beta_2 \mathbf{X}_{More\ than\ one\ source\ of\ fund} + \beta_3 \mathbf{X}_{sex} + \beta_4 \mathbf{X}_{child} + \beta_5 \mathbf{X}_{income} + \varepsilon \quad (1)$$

4. Results

From testing 180 field experimental subjects, 30 random matching groups in rural and urban areas (3 members/group), 30 self-selected group lending in rural and urban areas (3 members/group), and 30 family ties groups in rural and urban areas (3 members/group), the result is as follows 1

Result 1: Low-income group in the form of random matching group and self-selected group living in urban areas has more tendency to flee the debt than the member living in rural areas.

To test the effectiveness of the repayment between subjects in urban area and rural area. This study compares the rate of repayment between subjects from rural areas and from urban areas and found the evidence of the difference in the repayment pattern between random matching group and self-selected group in both areas.

Table 1: Average repayment rate in rural and urban areas

Type of group lending	Rural area	Urban area
Random Matching group	0.78	0.73
Self-selected group	0.87	0.72
Family ties group	0.83	0.81

From table 1 we found that the average rate of return in the random matching group is 0.78 and 0.73 accordingly. In self-selected group, the difference in the rates of return is clearly of 0.87 in rural area and 0.72 in urban area. In family ties group, we found that the rate of return in rural areas and urban areas is 0.82 and 0.81 respectively. Even though the rate of return of family ties group in rural area is lower than the data from self-selected group, the finding shows that there is no difference in term of repayment efficiency between rural area and urban area.

To test the differences in the debt repayment between members living in urban area and rural area, we studied the repayment ability of the market vendors by using Simple Regression Method.

Table 2: Simple regression on period of group default.

	Random matching group	Self-selected group	Group with family ties
Constant	2.4***	3.0***	2.6***
	(0.159)	(0.176)	(0.162)
Rural/Urban	-0.8**	-1.3**	0.3
	(0.225)	(0.25)	(0.23)
R-squared	0.178	0.31	0.02

Standard errors in parentheses *, ** and *** indicate significance at the 10%, 5% and 1% levels respectively

From table 2, we found that both random matching groups and self-selected groups in urban areas have significantly different repayment abilities. The study shows that periods of group lending in urban areas were shortened by 0.8 and 1.3 periods for random matching groups and self-selected groups respectively than those in the rural areas. When we compare the result to the group in rural area, members know each other even in the random matching group that is different from the random matching group in urban area. This reason may drive from the difference between the size of markets in the rural and urban areas. In the self-selected group, the period of grouping is quite different due to the difference in strength of the social ties in both areas. In rural area, most of the vendors know each other quite well while market vendors in urban area has only superficial contact. We discovered this from the basic questions such as where do the other members in the group live? or have you ever attended other members' ritual ceremonies (for example, wedding or funeral)?. Urban group subjects hardly know the exact location of other members in the same market or hardly ever attended their ceremony. Instead of attending this ceremony, they only help other members in the form of money. In the family ties group, there are no differences in term of debt repayment when the areas change from rural to urban.

The result confirms the result in the study from Adriana (2010) that the effectiveness of the loan relies on the area of loan providing. The result

is also compatible with the survey from Thailand Development Research Institute. (2013) stating that urban areas have a higher default rate than rural areas. However, we found no differences in the debt repayment ability of the family ties group in both rural area and urban area, which means that family ties group may reduce the problem of weak bonding in urban areas.

Nowadays, Government Savings Bank use group lending as the main tools to help low income people around the country regardless of the relationship between group members and the difference in geographic data. The result shows that lending does not perform well in urban area and the loan default rate is still high in urban area group.

Base on the testing 90 field experimental subjects only in urban areas, 30 random matching groups (3 members/group), 30 self-selected group lending (3 members/group), and 30 family ties groups (3 members/group), the results are as follow

Result 2: Under urban society that the relationship among member is weak. Group lending with family ties can increase the repayment rate.

To test the ability of loan repayment in each group, this study calculated the rate of repayment of each group (Appendix C.) to compare the repayment abilities as shown in Figure 3.

Figure 3. Average rate of repayment for all group in urban area

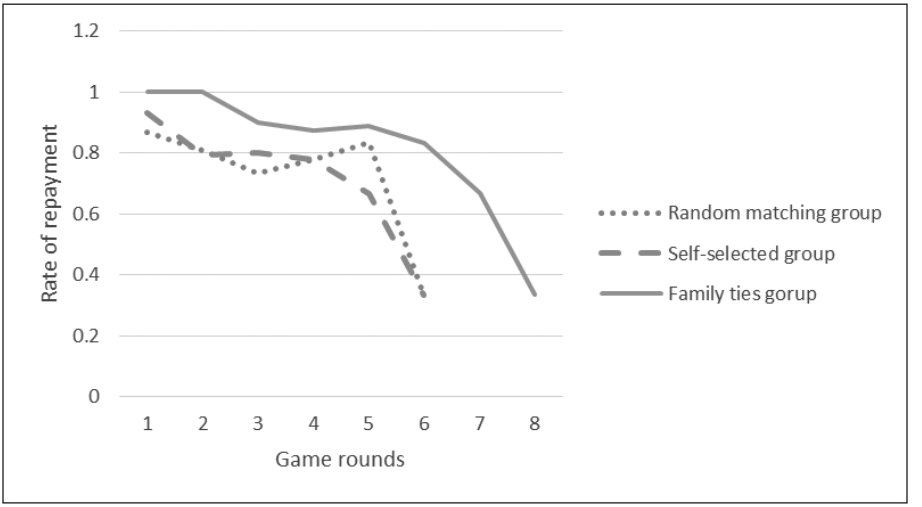


Figure 3 shows the average repayment rate in the urban area where social bondage among group members is weak. The average rate of repayment are 0.72 (6 rounds) 0.71 (6 rounds) and 0.81 (8 rounds) for random matching group, self-selected group and family ties group respectively.

If we compared the result between the random matching group and the self-selected group. The study shows that in the beginning of the game (round 1-3), the self-selected group has a better rate of repayment than random matching group. The average rate of repayment of self-selected group are 0.84 and 0.8 for random matching group. However, when the first stage ends, loan default in the self-selected group increases exponentially compared to the random matching group that had better rate of repayment. The average rate of repayment of round 4-6 are 0.64 and 0.59 for random matching group and self-selected group accordingly.

However, the rate of repayment alone cannot lead to the conclusion that one group has better repayment efficiency than the other group. This is because the loan default can be caused by 2 main reasons. (1) Unintentional default because of the failure in investment resulting in not having enough money to make the repayment. (2) Intentionally avoiding repayment (Free-riding problem).

Therefore, if the repayment rate decreases from reason number 1, we cannot conclude that the group with low repayment rate has lower group efficiency. To study the result of the free-riding problem, we calculate the percentage of default occurring in stage 4 in the experiment game (section 3.4.1). The repayment decision in stage 4 of the experiment game determines the real repayment in the whole group without the effect of loan default from other members. The study also calculate the percentage of group assistance when other members in the group face a default problem. The result is shown in table 3

Table 3: Percentage of members who succeed in investment and no repayment of the debt

Group	Random matching Group	Self-selected Group	Group lending with Family ties
Members succeed and do not repay in all 1-3 rounds	12.03%	5.89%	1.19%
Members succeed and do not repay in all 4-6 rounds	17.77%	37.22%	3.73%
Members succeed and do not repay in all 7-8 rounds	-	-	33.33%
Members succeed and do not repay in all 1-6 rounds	14.9%	21.55%	10.18% (1-8 rounds)
Member assistance in all 6 rounds	0	0	33.33% (in all 8 rounds)

Table 3 shows the decision to repay debt in the members who have successful investment. We found high percentage of the free-riding problem in the random matching group in the beginning period (round 1-3). The percentage of the experimental subjects who decide not to repay is 12.03%, very high when compared with 5.89% in self-selected group and 1.19% in family ties group. However, when we look at the result of the latter half of the game (round 4-6), the result is reversed. Free-riding problem in self-selected group increases rapidly. The free-riding problem in the self-selected group increases to 37.22% and 17.77% for the random matching group. The increasing free riding shows the lack of efficiency in self-selected group in long term. When considering the average result from the game, Free-riding in self-selected group is higher than that of the random matching group with the percentage of 21.55% and 14.9% respectively. This problem is one of the factors that influence the rate of repayment in self-selected group that has the lowest number of repayment among the 3 types of grouping. The result is compatible to the study by Basley and Coate (*1995)*. They concluded that in the case of strategic default, areas with weak social ties have lower social cost which increase loan default problem.

Loan default rates in the urban area shows that the self-selected group in weak tie society is no better than random group type. This result contradicted the work by Abbink (2006), Gomez and Santor (2003) found that the self-selected group has higher efficiency than random matching group. However, when we study on family ties group, Free-riding problem is low averaging at only 10.18% even without any monitoring. Group assistance in the family ties group has the highest rate of assistance among the 3 groups, which is 33.33%. No assistance was found in both random matching group and self-selected group simulation.

The result from Cheewatrakoolpong et al. (2011) shows that the group lending that is grouped by occupation by Government Savings Bank in urban area gives higher rate of loan default when compared with the same type of group lending in rural area. However, the result shows that if we change the self-selected group lending type to family ties type, we can increase the group lending efficiency and reduce the default rate.

Result 3: Remittance is one of the factors that contribute to increase of the bond in the group, but if group formed by a member that has more than one source of loan, the strength in the group drops.

Table 4: Ordered Logit regresstion of difference in repayment rounds against set of controls

	Random matching group	Self-selected group	Group with family ties
Remittance	0.734*	1.7613**	1.774**
	(0.809)	(0.82)	(0.883)
More than one source of fund	-1.512	-1.643**	-1.799**
	(0.879)	(0.823)	(0.879)
Sex	0.710	0.1517	1.26
	(0.725)	(0.8572)	(0.117)
Child	-0.647	-1	-1.52
	(0.779)	(0.771)	(1.01)
Income	-0.001	0.0015	0.0021*
	(0.001)	(0.0012)	(0.0012)
Pseudo R-squared	0.107	0.1	0.32

Standard errors in parentheses, * , ** and *** indicate significance at the 10%, 5% and 1% levels respectively

Table 5: Odds Ratio

	Random matching group	Self-selected group	Group with family ties
Remittance	2.084 (1.687)	5.82** (4.776)	5.89** (5.206)
More than one source of fund	0.22 (0.193)	0.159** (0.159)	0.165** (0.145)
Sex	2.034 (1.475)	1.163 (0.9977)	3.545 (2.868)
Child	0.523 (0.407)	0.367 (0.283)	0.218 (0.22)
Income	0.998 (0.001)	1.001 (0.0012)	1.002* (0.001)
Pseudo R-squared	0.108	0.108	0.22

Standard errors in parentheses, *, ** and *** indicate significance at the 10%, 5% and 1% levels respectively

From table 4, when we test the factors that affect the repayment, we found that the remittance is one of the main factors that have a direct impact on group efficiency significantly. The result shows that the group with at least member with remittance burden has higher repayment discipline than the group with no remittance. The number of sources of fund is also another important factor. If members have more than one funding source, the repayment efficiency is reduced significantly in both self-selected group and family ties group. Apart from that, in the family ties group, we found that personal income is one of the factor affecting the efficiency of the group.

From table 5, when we look at the odds ratio we found that the group with remittance burden has 5.82 times a longer group period in self-selected group and 5.89 times longer in family-ties group than the group without remittance. Carrillo (2010) also did the study on remittance. However, the work is done on the side of the subjects who receive remittances and found that low-income people who receive remittances and borrow money tend to have higher loan default rate than those without remittances. This study will concentrate on the member with remittance instead. The member with remittance burden shows discipline on their spending and their loan repayment. From the subject interview, we found one interesting issue shown in Example 1.

Example 1: Remittance burden or being the family main source of income helps build spending discipline.

Fruit parlor owner in Talad Thai Market said that he currently has no default but he has co-mortgage loan together with his wife using the land in the suburb as collateral. They have 1 year to pay of 40,000 THB loan. When they have revenues, he will spare about 3,500 baht per month for debt repayment and another THB 1,000 as remittance to send their to hometown. They will use the rest of the revenues for private consumption such as socializing with his market fellows.

From the interview with the experimental subjects about accessibility to fund, household consumption are the main reason to get a loan and other reason is an unpredictable event such as family member's illness. However, when we ask further about the loan channel, the experimental subjects will separate the loan channels by the amount of expected loan. If the amount is huge and for future investment, they will choose Government Savings Bank as their loan source. If amount is small and for personal consumption, they will use shark loans service because it is faster to get money even if the interest rate is high. Most of the experimental subjects have confidence that they can repay when they decide to use shark loan services. The problem of this situation is shown in Example 2.

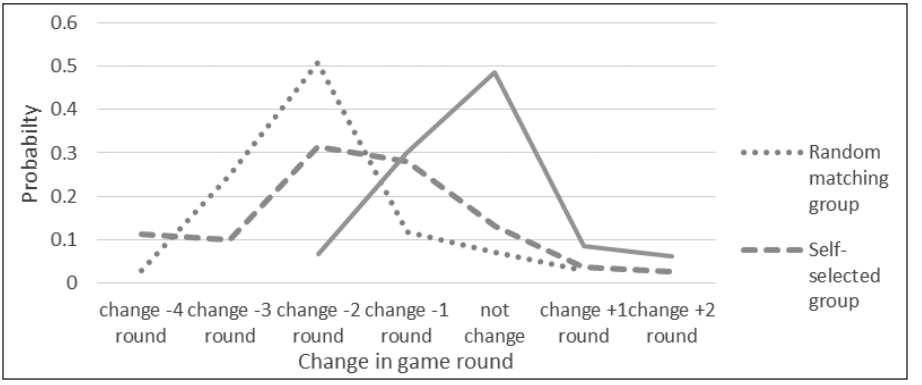
Example 2: Lack of discipline in spending is the main reason of loan default.

Food stall owner in the Wongwian Yai market said that now she has 5 sources of debt, 4 are sharks loan and one from Government Savings Bank. She started from borrowing from Government Savings Banks to invest in the shop. Half a year later, she borrow more from the shark loan to purchase new technology gadgets that the shop next door had installed. After borrowing from shark loan and facing daily loan interest, she finally could not repay the first debt and started to find more funding from other sources to recover the debt. The debts are getting more and more serious that she could not handle them anymore and that is the time her family knew about them. Her family has helped to monitor the spending and eventually cleared the debt for her.

This study also use the number of fund sources as one of factors in the study to explain the loan default behavior. We found that if the experimental subjects have more than one source of funding, the period of grouping decrease to 0.159 times in self-selected group and 0.165 times for family ties group compared with the group that has one source of loan.

We checked the change in probability in different kinds of grouping methods (figure 4). When we look at the probability of the game round, we found that the random matching group has *50%* chance to reduce the grouping period by *2* rounds when compared to the rounds in the individual game. The self-selected group has *31%* chance to reduce the grouping period by *2* round compared to the rounds in individual lending game. The family ties group has *49%* chance to keeping the same number of round as in individual lending game.

Figure 4. The probability that the number of the game round will change in many different types of group forming.



Therefore, in the area with weak social bondage between members, the study found that the self-selected group has no efficiency in reducing the loan default. We found that in weak social ties environment, the self-selected group has high rate of loan default. The repayment rate in the self-selected group is very close to the rate of repayment in the random matching group and the default period in the random matching group is even closer than the default period in the self-selected group lending.

Result 4: When faced with idiosyncratic shock in group lending with family ties, a member is more likely to pass the effect of the shock to other members than in other types of group lending.

When one member in a group lending experiences a severe shock, it can cause the member to loose his/her income which sometimes include his/her saving. Under this situation, which one of 3 kinds of group can insulate the shock the best?

Idiosyncratic shock such as accidents, unemployed or illness is used in this study, and is faced by low income people the most. The key characters of idiosyncratic shock is that the shock will occur to individual only and its effect cannot be passed to the other members.

Table 6: Number of members who contribute to group survival

	Contribute to group (give a token)		Contribute to member (give a heart)	
	N	Percent	N	Percent
Random matching group	20	66.7%	10	33.3%
Self-selected group	22	73.3%	8	26.7%
Family ties group	11	36.67%	19	63.3%

The members that do not facing the shock (still hold the hearts) will choose to give assistance in the form either token or heart. Token will help other member to continue investing and the heart will help them to receive compensation when the game ends with the risk that the whole group will not be able to invest in the next round.

From table 6, we found that the random matching group and self-selected group have good protection from idiosyncratic shock because when one member faces the shock, the other members are only interested in their own chance of investment in the next round. They will choose to give some token to repay the group loan in total of 900 token and the group can continue their investment in the next round.

In the random matching group, the loan assist rate is 66.7% for the random matching group and 73.3% for the self-selected group. The result is different from the result in the family ties group. The family ties group are not concerned about future investment but they care for the other member. They choose to give out their hearts as their assistance decision with the rate as high as 63.3%. By giving out the heart, the group will automatically turn into default status since their total repayment is lower than 900 token. The assistance rate in random matching group and self-selected group are only 33.3% and 26.67% respectively.

Therefore, when the shock occurs, the shock can pass to the other player in the family ties group and this is the reason why family ties group has faster default than the random matching group and the self-selected group.

From the study, we can conclude that in strong social ties like in rural area, the self-selected group lending can decrease the loan default rate efficiently. This outcome is the same as the result from Abbink (2006), Floro and Yotopolous (1991). However, in weak social ties, the self-selected group lending reduces the efficiency of the group and increase the default rate. The reason for higher loan default is that when members in the group are not close to each other, they feel no bond and tend to choose loan default even when they succeed in investment. They will hardly help other member financially. This result is the same as the work by Besley and Coate (1995) and Kono (2006). They found that the group with low social cost has higher a loan default rate.

Unlike other group lending studies, this study uses family ties group lending. This kind of grouping gives a very interesting result. The family ties group lending is very efficient towards default rate especially in weak social ties society. This is because the bond in the family is tighter than the bond in self-selected group. The better efficiency is shown in the form of higher repayment rate and lower loan default than other types of group lending. The family ties group lending also gives better assistance rate among group members. Even though family ties group lending is better for weak social ties society, this type of group lending is very sensitive to shock which can increase the loan default rate.

5. Conclusion

From the difference in the social cost between urban areas and rural areas, the group lending in the form of random matching and self-selected group will not perform well in urban area. This study focuses on an alternative type of lending for microfinance (i.e. Family ties group) to help them increase the repayment rate under the low social bondage environment.

The study is divided into two parts. Firstly, the field experimental game which is adapted from the work by Abbink (2006) to test the repayment ability in three types of group lending. Secondly, we brought the data from field experimental to analyze the factors that affect the length of grouping period by using Ordered Logit Model. We can conclude that under low social bondage environment, the efficiency of group lending is reduced. The random matching group and self-selected group in urban area have lower rate of return than low-income group from rural area because the group lending is formed under the weak social ties condition. As long as the social cost in the group lending in urban area is not high enough, the free-riding problem will still exist and can become more severe than in the rural area.

In strong social ties area like in rural areas, the self-selected group lending is the most effective type of group lending in both repayment term and shock persistence among efficiency is reduces. The repayment rate is indifferent from the result of random matching group, where the family ties group gives better repayment rate even in the weak social bondage area. However, family ties group lending is very sensitive to shock compared to the other group lending types.

In urban area, the family-ties group lending with mutual collateral gives a good outcome with high efficiency of repayment rate, compared to the rate of repayment in the random group lending and the self-selected group lending. When we tried to find the factor that impact the length of grouping time through Ordered Logit Model, we found that remittance is a very important factor that helps increase the grouping period. In the self-selected and family ties group, more than one source of loan is also the main factor that leads to the lack of repayment discipline which mostly ends up in loan default.

However, group lending with family ties is more sensitive to shock than the normal type group loan (the random matching group and the self-selected group) because when shock occurs, every member in the group will tend to get involved and suffer together. This will reduce group ability to repay the debt and if the shock is too harsh, the whole group has high potential to decide on the loan default. However, in the case of normal type group lending, we found that the shock effect will not be passed to other member in the group.

6. Policy Implication

One of the problems of group lending in urban area is the low bond between group members. This study purpose is to show that the change in the type of group lending from self-selected group to family ties group can reduce the default of loan caused by weak relationship among group members. Good relationship between members in family ties group allows each member to offer help to other members when they face default problem. In rural area, the study found out that self-selected group has ability of repay the principal amount of their investment.

In Thailand, family ties group lending is still not very popular but the example of MFIs can be represented the family ties group for example, Cashpor microcredit in India that use collateral from family in rural area for group lending if the borrower lives in an isolate area and cannot join the training program (Puhazhendhi 2013). Abazamukana (Pilot project in Rawanda) that allow the family members combine with 20% of loan deposit in savings account to guarantee the loan (Wilson) or in Islamic microfinance, they tends to lend to whole family rather than individual (Abdul Rahman, 2007).

The public agency that involves in the policy implementation is Specific Financial Institutions (SFIs) such as The Government Savings Bank, which is responsible for helping poor people to have access to financing sources.

References

Abbink, K., Irlenbushch, B. & Renner, E. (2006). Group size and social ties in microfinance institutions. *Economic Inquiry*, 44: 614-628.

Abdul Rahman, A. R. (2007). Islamic microfinance:A missing component in Islamic Banking. *Kyoto Bulletin of Islamic Area Studies*, 1-2 (2007), pp. 38-53.

Adriana, de la Huerta. (2010). Microfinance in rural and urban Thailand: Policies, Social Ties and Successful Performance. University of Chicago

Aghion, A. B., & Murdoch, J. (2005). The economics of microfinance. Cambridge: MIT Press.

Ahlin, C. & Townsend, R. M. (2006). Using repayment data to test across models of joint liability Lending. *Economic Journal*, 117(517): F11-F51

Alesina, A. & Ferrara, E. L. (2000). Who Trusts Others?. Centre for Economic Policy Research, Discussion paper No. 2646.

Bauer, M., Chytilova, J. & Morduch, J. (2012). Behavioral Foundations of Microcredit: Experimental and Survey Evidence from Rural India. *American Economic Review*, 102(2): 1118-39.

Besley, T., & Stephen, C. (1995).Group lending, repayment incentives and social collateral. *Journal of Development Economics* 46(1), 1-18.

Bhatt, N. & Tang, S. Y. (2002). Determinants of repayment in microcredit: Evidence from programs in the United States. *International Journal of urban and Regional Research*, 26(2), 360-376.

Carrillo, N. R. (2010). Family and group ties in Microfinance activities framed field experiments in Mexico. Masterstudiengang in Industrial and Network Economics (MINE)

Cason, T., Gangadharan L., & Maitra, P. (2008). Moral hazard and peer monitoring in a laboratory micro_nance experiment. Institute for Research in the Behavioral, Economic and Management Sciences, Paper No. 1208.

Cheewatrakoolpong, K., S. Kiatsupaibul, P. Kulwalairat, S. Mallikamas, A. Pawasutipaisit & S. Terapat (2011). Demand for microfinance products in Thailand and the Government Savings Bank strategies‖. Government Savings Bank, Bangkok

Ermisch, J., & Gambetta, D. (2008). Do strong family ties inhibit trust? Economic and Social Research Council, 37.

Fischer, G. (2013), Contract Structure, Risk-Sharing, and Investment Choice. *Econometrica*, 81: 883–939. doi: 10.3982/ECTA9100

Floro, S., & Yotopolous, P. (1991). Informal credit market and new institutional economics: The case of Philippine agriculture, Westview Press: Boulder

Ghatak, M. (1999). Group lending, local information and peer selection. *Journal of Development Economics*, 60(1), 27-50.

Gomez, R. & Santor, E. (2003). Do peer group members outperform individual borrowers? A test of peer lending using Canadian micro-credit data. Bank of Canada Working paper, 33.

Hofferth, S. & Iceland, J. (2011). Social capital in rural and urban communities. Rural Sociology 63(4), 574-598.

Karlan, D. (2005). Using Experimental Economics to Measure Social Capital and Predict Financial Decisions. *American Economic Review*, 95(5): 1688-1699.

Kevane, M. & Wydick, B. (2001). Microenterprise lending to female entrepreneurs: Sacrificing economic growth for poverty alleviation?. World Development, 29:1255-1236.

Kono, H. (2006). Is Group Lending a Good Enforcement Scheme for Achieving High Repayment Rates? Evidence from Field Experiments in Vietnam, Mimeo, Institute of Developing Economies, Chiba, Japan.

Mokhtar, S. H., Nartea, G. & Gan, C. (2002). Determinants of microcredit loans repayment problem among microfinance borrowers in Malaysia. *International Journal of Business and Social Research*, 2(7): 35-45.

Okten, C. & Osili, U. O. (2004). Social Networks and credit access in Indonesia. World Development 32(7).

Pearlman, S. (2012). Too vulnerable for Microfinance?: Risk and Vulnerability as Determinants of Microfinance Selection in Lima. *The Journal of Development Studies*. 48(9), 1342-1359.

Puhazhendhi, V. (2013). Microfinance India : State of the Sector Report 2012. India, Sage Publication India Pvt Ltd.

Wilson, T. "Lessons From a Microfinance Pilot Project in Rwanda." from http://www.ennonline.net/fex/20/lessons.

Stiglitz, J. (1990). Peer Monitoring and Credit Markets. *World Bank Economic Review*, 4(3):351-366.

Thailand Development Research Institute. (2013). Microfinance Inclusion Map – MIM. Thai Health Promotion Foundation.

Xavier, G., Jakiela, P., Karlan, D., & Morduch, J. (2010). Microfinance Games. *American Economic Journal: Applied Economics*, 2(3): 60-95.

Yamagishi, T., Cook, K.S., & Watabe, M. (1998). Uncertainty, trust, and commitment formation in the United States and japan. *American Journal of Sociology*, 104:165-194.

Appendix A

Appendix A1. Answer sheet for individual lending game.

Round	Investment success (Yes/No)	Repayment (Yes/No)	Group assistance (Yes/No)	Total group repayment in the round	Go to next round (Yes/No)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Group no. ..... Member no. .....

Appendix A2. Answer sheet for group lending game with shock.

Round	Investment success (Yes/No)	Group assistance		Total group repayment in the round	Go to next round (Yes/No)
		Money	Heart		
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Group no. ..... Member no. .....

Appendix B: Description of independent variables.

Variables	**Description**
Difference in the number of default round	-2 if member has more game round in individual game than in Group lending game 2 period -1 if member has more game round in individual game than in Group lending game 1 period 0 if member has the same game round in individual game as in Group lending game 1 if member has less game round in individual game than in Group lending game 1 period 2 if member has less game round in individual game than in Group lending game 2 period
Sex	Male=1
Number of Children (persons)	if any = 1
Income (Baht)	Numbers
number of sources of fund	If more than 1 = 1
Rural/Urban	Urban= 1
Remittance or Head of household	remittance back to home area/Main source of household income = 1

Appendix C.

C.1 Repayment Rate.

Case1: When only one member in the group succeed in the investment. Lender will expect the successful member to repay 300 Token.

Rates of return = R1/300 ; R = Return from member

Case 2: If 2 members in the group succeed, lender will expect to receive the total of 900 Token repayment.

Rates of return = (R1+ R2) / 900 ; R = Return from member

Case 3: If 3 members in the group succeed, lender will expect to receive the total of 900 Token repayment.

Rates of return = (R1+ R2+ R3) / 900 ; R = Return from member ;
R= Real return from member