Choice of Microfinance Contracts and Repayment Rates under Individual Lending: An Artefactual Field Experiment from Pakistan

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Pakistan Institute of Development Economics, Islamabad

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ABSTRACT

An artefactual field experiment in a semi-rural town of district Sialkot, Pakistan was conducted using the randomly drawn subjects from the pool of potential microfinance borrowers in that area. Two different types of contracts were employed including a Non-Interest Based- Profit Sharing (PS) and a Conventional Interest Based (IB) contracts. The subjects were split into two groups where one had the option to choose from the set of available contracts while the other did not. Strong preference for PS contracts over IB contract had been observed, however the repayment rates did not differ significantly across the contracts. The female subjects showed a higher repayment rate than the male subjects. At the same time, the enforcement and penalty treatments and religiosity of the subject had a significant and positive effect on the repayment behaviour.

1. INTRODUCTION AND MOTIVATION

Microfinance refers to an organised framework of providing financial services to poor and low-income households of the society that aren't served by or have no access to formal financial institutions and banks [Conroy (2003)]. Microfinance is also described as banking for the poor. The microfinance programs have expanded the opportunities for the poor and marginalised segment of society through an easy access to capital for increasing their income and financial resources leading them in the way of self-sufficiency. The most significant aspect of these programs is the provision of microfinance facility for non-bankable poor without any physical collateral [Hulme and Mosley (1996)]. There are broadly two different formats under which loans can be obtained under such microfinance programs: individual liability and group liability loan contracts, where the latter was being the more used option by the existing Microfinance Institutions (MFIs).

A considerable part of literature studying conventional microfinance programs has evolved over the last two decades. Studies such as Banerjee, Duflo, Glennerster, and Kinnan (2013), Carpenter and Williams (2010), Dutta and Magableh (2006), Ghatak (1999), Ghatak and Guinnane (1999), Giné and Karlan (2014), Varian (1990), Wydick (1999) have focused on conventional microfinance system; whereas, Hassan (2010), Karim, Tarazi, and Reille (2008), Khan (2008), Morduch (1999), Obaidullah and Khan (2008) and Yousfi (2012) have focused on non-interest-based or Islamic microfinance systems. However, very few of them have studied the comparative efficacies of both interest- and non-interest-based microfinance systems—even in an economy with Muslim-dominated population. A notable exception, however, is a paper by El-Komi and Croson (2013) that reported the comparative performance of the conventional (interest based) and Islamic (non-interest based) microfinance programs. In particular, they compared two non-interest based contracts (Profit Sharing-PS and Joint Venture-JV) with the conventional interest-based (IB) contracts using a set of laboratory experiments. They found that PS and JV contracts

outperformed the IB contract in terms of repayment rates. Traditionally, the Profit Sharing (PS) contracts are more prone to enterprise failure, adverse selection, moral hazard and costly verification due to asymmetric information [El-Gamal (1997)]. To overcome the problem of moral hazard and costly state verification the effective tool of peer monitoring is widely adopted [Cornee and Masclet (2013)]. On the other hand, it has been argued that there has been risk pooling between borrower and lender in PS contracts due to its sharecropping phenomenon resulting in generating different power structure among both the borrowers and lenders. Thus, PS contracts are considered more equitable than IB contacts in creating a strong obligation for the borrower to comply with the terms of the contract to repay the loan in case of project success [El-Komi and Croson (2013)].

Traditionally, microfinance institutions (MFIs) prefer using group lending approach where members are held jointly responsible for the repayment of the entire loan. It has been argued that the use of joint liability contracts allows self-selection of the borrowers as each borrower has an incentive to join the group with safer borrowers. This thus saves on the ex-ante "screening costs" of the lender to identify the safe borrowers [Ghatak (1999), Van Tassel (1999)]. However, individual lending programs also exhibit several advantages. For example, Armendáriz and Morduch (2010) explained that role of guarantor who could apply adequate social pressure on the clients to repay their loans to MFI in Russia and Eastern Europe. On the other hand, Jaunaux and Venet (2009) questioned the effectiveness of guarantee mechanism in absence of assets that can be pledged as surety. This raises many technical issues such as transfer of pledged liquid asset to the permanently or otherwise, further, the transfer of non-tangible assets to the MFI if the institutional framework permits. In most of the cases, these conditions are not met in many developing countries. Another advantage of individual lending is that it saves the borrower's time in group meetings and maintain the privacy of their investment while discussing with the MFI [Giné and Karlan (2014), Lehner (2009)]. Although, numerous studies such as Aniket (2009), Dixon, Ritchie, and Siwale (2007), Guttman (2007), Hill and Sarangi (2012) have pointed out the merits and demerits of both group and individual lending microfinance programs, there is no conclusive statement of supremacy of one over the other. Interestingly, a few studies have observed the subjects had a choice from individual and group lending contracts [De Quidt, Fetzer, and Ghatak (2012)]. While Razzaque (2018), examined the effect of contract choice (among Profit Sharing (PS) and Interest Based (IB) microfinance contracts) and peer monitoring on repayment behaviour using the laboratory test-bed in Australia. He concluded that given the choice, people may prefer PS contract over the IB contract, but not necessarily resulting in high repayment rates in the absence of peer monitoring.

Contrary to the conventional finance, microfinance has been invented to achieve a more broader and just agenda, i.e. the economic mainstreaming and empowerment of marginalised and poorest of the poor groups such as women and minorities. Among this, the gender issue always remained an important aspect while examining the microfinance market. Several studies have investigated gender differences in the repayment behaviour in microfinance programs. Using laboratory experiments, El-Komi, and Croson (2013) compared the compliance rates of male and female borrowers under both Islamic and conventional microfinance and found the females better complying. In another related study, D'espallier, Guérin, and Mersland (2011) used data from 350 MFIs from 70 countries found a similar pattern with female borrowers being better re-payers than their male counterparts. Overall the gender behaviour in microfinance literature showed mixed results [Armendáriz and Morduch (2005), Banerjee and Duflo (2010), Khandker (1998), Nafziger (1997), Sharma and Zeller (1997), Thomas (1990), Thomas, Contreras, and Frankenberg (2002)].

While, there also exist a few papers on the religiosity and repayment behaviour of the microfinance agents [Haar and Ellis (2006), Marshall and Keough (2004), Thomas and Tutu (2005)]. It might be expected that other things being constant, a more religious borrower would exhibit better repayment behaviour. The evidence on this, however is still inconclusive [Ashta and De Selva (2011), Noland (2005)]. Mersland, D'espallier, and Supphellen (2013) compared the Christian MFIs and secular (conventional) MFIs and found that lowering the interest rates on loans (compared to secular MFIs) negatively affected the performance of Catholic MFIs. This paradoxical result suggests that behaviour of the "religious borrowers" might be governed by factors other than the purely economic ones as perceived by neo-classical economists. Finally, El-Gamal, El-Komi, Karlan, and Osman (2014) conducted artefactual field experiments in Egypt to study the incidence of borrowing and repayment behaviour using an Islamic microfinance model implemented by Rotating Savings and Credit Association (RoSCAs). They found a significant increase in the take up rate of 91 percent in the RoSCAs against a take up rate of 75 percent in Grameen Model and concluded that Islamic microfinance has great potential in the Muslim world.

In this paper, the effects of choice of microfinance contracts (Profit Sharing-PS and Conventional Interest Based-IB) faced by a set of potential microfinance borrowers[1] in an artefactual field experiment[2] from semi-rural

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[1]This group satisfies the minimum criteria of obtaining loans from MFIs. For further discussion, on this please refer to Appendix-1.

[2]Artefactual field experiments are the experiments using real-world subjects in a laboratory settings for more details see Barboni, Cassar, Trejo, and Wydick (2013) Adverse Selection and Moral Hazard in Joint Liability Loan Contracts: Evidence from an Artefactual Field Experiment. *Journal of Economics and Management* 9, 153–184.

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town in Pakistan were examined. The key objective of this study was to investigate the demonstrated preferences/ choices over the contract and its effect on the repayment behaviour of the subjects. The contract design, payoffs and treatment structure of both PS and IB contracts were similar to the ones that were used by El-Komi and Croson (2013). Based on the contract choice structure adopted by Razzaque (2018), the subject's behaviour when given option to choose between either of the above two contracts to the one where no choice of contract was offered. The reason for using this particular treatment was to examine the change in the repayment responses of subjects affected by the choice of contracts. In particular, the gender differences in the repayment and choice differences with the role of religiosity of subjects affecting the behavioural responses were also explored.

The results of the study indicated significantly higher repayment rates in PS contracts compared to that in the IB contract. A high degree of preference for the PS contracts in choice of contract case against the IB contract was observed. While the repayment rates did not differ significantly. At the same time, when the choice of contract was not an option for the subjects the repayments rates for both PS and IB contract were not significantly different. On the other hand, there were no significant differences in male and female subjects for the choice of PS contract and repayments. Further, significantly positive effect of enforcement with penalty treatment was showed during the choice and no choice situation for both PS and IB contract. However, the religiosity of the subjects remained one of the important and consistent factors that positively affected the repayment responses.

The rest of the paper is organised as follows: section 2 describes the experimental contracts, design and execution of the artefactual field experiment in Pakistan while the results of these experiments are discussed in section 3 and section 4 concludes.

2. EXPERIMENTAL CONTRACTS, MODEL AND DESIGN

2.1. Contracts

Two types of microfinance contracts such as Profit Sharing (PS) is a non-interest based and the other is the conventional interest based (IB) contract were employed in this study. Below, a brief description of both the contracts is given:

2.1.1. *Profit Sharing (PS) Contract*

Under the *PS* contract, the financier/lender offers the investment capital, while the borrower gives his time, labour and expertise to work on the investment project. The profits from the investment are shared according to the agreement made at the time when the loan was provided. In case of a loss, however, the lender suffers all of the financial losses, while the borrower loses

his/her time and effort spent on the investment. But if, the loss has resulted from the negligence, misconduct or any breach of agreement by the borrower, then the borrower is held responsible for the repayment of the entire investment amount to the lender.

2.1.2. *Interest Based (IB) Contract*

Under the *IB* contract, the lender provides the total capital for the investment at certain agreed upon interest rate. The borrower has to pay the lender the loan amount plus the interest rate conditional upon a success of the project. In case of default[3], the lender made forced collection of their investment.
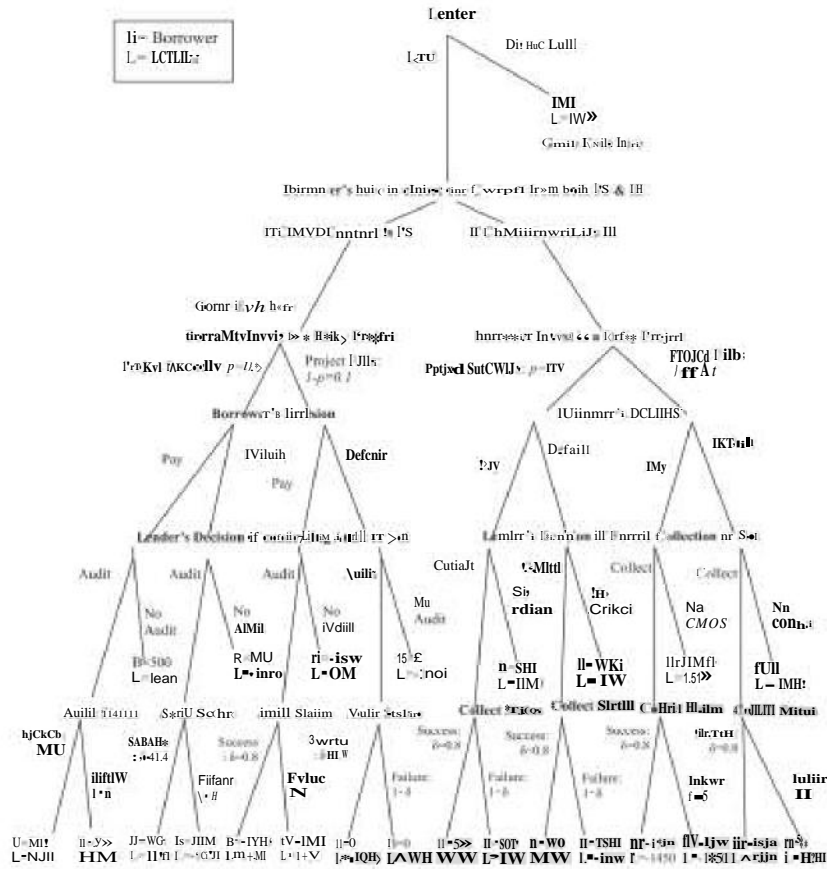
2.2. Model

This experiment is based on a game theoretic model with equal degree of risk sharing. The model constitutes three separate treatments for both contracts and extensive form representation is shown in Figure 1 and 2. The three treatments are: *No-Enforcement (T1), Enforcement (T2)* and *Enforcement with Penalty (T3).* In T1, based on the report of the borrower, the game ends with appropriate payoffs. In case of reporting default, the lender can either audit the project's return (in case of PS) or forcing collection (in case of IB) in T2. In T3, the lender also enforced penalties on the borrowers who wrongly reported project's success in addition to the actions in T2. Thus, 80 percent success rate of auditing the project's outcome for the PS contracts and enforcing the collection of the IB contracts was set. The borrowers were aware of the stages in T2 and T3 where the lender succeeds in the enforcement stage with probability δ *(80 percent)* and that the enforcement costs γ *=5 percent* of the total loan amount. The penalty amount equaled the cost of enforcement action by the lender.

Under these settings, lender (the experimenter in our study) has the opportunity of offering loans to the borrowers (the student subjects). Thus, the subjects/ borrowers were given a loan of the size *(L)* to be invested in a risky project. The project returns βL (where β is investment multiplier, $\beta > 1$) with probability *(p)* or return zero with probability *(1-p)*. Upon success, the borrower has to decide whether he wanted to pay back his loan or not. The borrower has to pay back $L (1+i)$ in case of IB contract while he has to pay $S\beta L$ under PS contract, where i is the interest rate $0 < i < 1$ in case of IB contract and S is the share of lender in the project returns $0 < S < 1$ in case of PS contract. We

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[3]For serious defaults, collateral (if any) can be seized, or guarantors called upon microfinance customers are normally excessively poor, making it impossible to offer any property as collateral, so microfinance lenders use alternative methods to encourage repayment. The most well-known strategies are: i) threatening not to offer loans later on to customers who default and ii) enforcing peer pressure to ensure that borrowers repay.

Fig. 1. Extensive Form—With Choice of Contract (WC)

adjusted the parameters to equalise the payoff of the borrower across the treatments when the project is successful (*90* percent of the time) and he/she complies with the conditions of the contract. This condition determined the loan size for the IB and PS contracts by *L = 1000* points. We set the probability of project success as high as *p=0.9* in order to ensure that subjects may have sufficient opportunities to comply with their contracts (repay the loan). On the other hand, setting the share of lender *S=0.75* and interest rate *i=0.5* in case of PS and IB contracts respectively ensured the equality of payoff across contracts. Thus, IB payoffs equal PS payoffs *SβL= L(1+i)*. Under these specifications for each of these scenarios, if the borrower did not falsify its report, its payoff would have been 500 points while the lender would have retained 1500 points, while the payoff from reporting failure 2000 points. Since both the contracts PS and IB have the same consequence and resulting payoffs, it is assumed that their choice would reflect their tendency toward the terms and condition of the contract instead of payoffs.

It is safe to predict that the lender will lend the loan and the borrower regardless of his/ her contract and will default to maximise payoffs. In contrast, it is anticipated that the enforcement and enforcement with penalty conditions have a positive consequence on loan repayments. It is also believed that the PS loan contract would fetch better repayments as the borrower may feel it more equalising in terms of power sharing between lender and borrower. Hence, the borrower would reciprocate by increasing repayment to the contractual settings.

2.3. Design

The subjects were randomly chosen from the localities living in the semi-urban area of District Sialkot, Pakistan. The recruitment of the subjects was made by advertisement through posters/flyers at the AUTAQ, local bus stands and workshops. No personal contact between the experimenter and the people was ensured during recruitment/enrolment process. Initially, the prominent and influential people were approached to seek their approval for the experimentation, and they granted permission to use the AUTAQ. Moreover, four support persons[5] were available to help the experimenter in conducting the experiment. All the completed consent forms (of those who satisfy the minimum eligibility criterion[6]) were separately placed in two boxes (one box for male and the other one of female consent forms). One male and one female from the locals (voluntary) were selected to randomly pick 100 consent forms[7] from each of these two boxes. The only consideration in selection of subjects was that they must be qualified to obtain a microfinance loan from an MFI.

A total of 188 people (100 males and 88 females) were selected who participated and completed the experiment. A short speech was delivered in the local language, i.e., Punjabi and Urdu at the AUTAQ (common gathering place of the town) to explain the purpose and justification of the experiments to the participants. The male and female subjects were seated separately[8] in the AUTAQ.

The subjects were paid Rs 500/- (AU$5 approximately)[9] for their time and participation in the experiments as a show-up fee. The subjects were not permitted to talk to each other while in the room and before the start of the experimental session. The experimenter explained the structure of the

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[5] The resource personals (including two male and two females) were also anonymous to the subjects.

[6] See Appendix- 1.

[7] There were 100 consent forms for female subjects, but at the time of experiment only 88 female subjects were present.

[8] Due to social and cultural restrictions, male and female subjects were seated in separate rooms.

[9] At the time of experimentation, the daily wage rate for a skilled worker ranges between Rs 400-600 per day (on average) in Pakistan. Therefore, show up fee was set to Rs 500, which was equal to a complete day wage of a skilled labour.

experiment to all the subjects and provided them a handout of general instructions (translated in the local language) regarding the experimental procedures. All the subjects were given 30 minutes time to read the instructions given in the handout.

Each participant was endowed with 5000 points at the beginning of the session[10], and earned (and lost) points based on the decisions they made. At the end of the experimental session, point balance for each participant was encashed for them into Pak Rupee (at the rate of 1000 points = Rs 100 or ~ AUS 1) as their take home earning.

Before the start of experimental sessions, the subjects were randomly classified into four categories and were seated in four separate rooms: i) Male subjects with choice of contract; ii) Male subjects without the choice of contract; iii) Female subjects with choice of contract and; iv) Female subjects without the choice of contract. The session lasted for approximately 60 minutes. All the subjects were allotted a distinct roll number and they were asked to write it on the contract file (either self-selected or allocated by the experimenter). Importantly, in all of the treatments the subjects had full information about the outcome of their investment projects. To ensure this, the subjects were provided with the ten sealed envelopes. Each envelope contained a card showing success or failure of the project. In total nine envelopes contained cards showing the success and one showing failure (as the probability of success of the project was 90 percent). At the start, each subject had to pick one envelope randomly from the given ten envelopes, checked the success or failure status of their project marked on the card inside the envelope and then returns the envelope back into the box. This procedure was repeated for both the contacts under with choice and without choice conditions and across all the three treatments. Once outcome of their project is known, the subjects were to open the file and make repayment decisions for each treatment of the available contract.

After completing the experimental session, the subjects were asked to fill out a post-experimental questionnaire that sought information on some personal characteristics including questions on their religious belief. After this, subjects were called individually (roll number wise) for payment that includes the show up fee plus the earnings they made during the sessions.

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[10]According to endowment theory the mere ownership of a thing causes people to assign greater value to it than they otherwise would. It also posits that ownership sets one's reference point, the movement from which triggers either a perceived gain or loss, and that people perceive the transfer or sale of endowments as losses. Finally, Endowment theory predicts that, other things being equal, giving a person something will change her expressed preferences with respect to it see Thaler, R. (1980): "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behaviour & Organisation*, 1, 39-60.Therefore, we believed that the initial endowment played a key role in extracting the behaviour of the subjects in No Enforcement as well as under the Enforcement treatments. In this connection, each subject was endowed with 5000 points at the beginning of the session.

3. RESULTS AND DISCUSSION

In this experiment, the primary interest was to study the repayment decision of the subjects to explore the dominant choice preference between PS and IB contracts using the repayment percentages, the McNemar's test and Panel Logit regressions. For demographic details, see Table 1.

Table 1

Demographic Summary

Description	Percentage	Average
Sex		
Female	46.81	
Male	53.19	
Education		
Never went to School	5.26	
Primary	21.58	
Middle	33.68	
Secondary	27.89	
Higher Secondary	6.32	
Diploma	2.11	
Graduations	3.16	
Marital Status		
Married	44.74	
Unmarried	55.26	
Age		28.3 years
Income		Rs. 10002 per month
Experience		3 years
Skill level		
Skilled	59.53	
Unskilled	40.47	
Property Residence		
Parents/ Family Owned	24.74	
Rented	21.05	
Self Owned	54.21	
No. of Family Members		8 persons
Modes of Transportation		
Bicycle	6.32	
Motor Cycle	11.53	
No transport	66.84	
Public Transport	15.31	
Degree of Religiosity		3.1

3.1. With Choice of Contract Session

The analysis starts with the findings from the session where the subjects had the option to select between the PS and IB contracts. From the total subject pool of 188, only half of the subjects (i.e., 94) participated in these sessions. Of these, 50 were male subjects and the rest were female.

Table 2 shows that given the choice between PS and IB contracts, almost 86 percent of the subjects chose the PS contract while the rest opted for the IB contract. It was also found that the repayment rates were comparatively higher in the PS compared to IB contract under all treatments. Furthermore, the repayment rates in PS contract increased from 77 percent in T1 to 85 percent in T2 and finally to 94 percent in T3 treatments. Similarly, for IB contract an increase in repayment rates in T1 from 62 percent to 77 percent in T2 and 92 percent in T3 had been observed. Thus, suggesting that the presence of enforcement treatments (T2 and T3) had a positive effect on the loan repayment behaviour across the contracts. These results were consistent with the findings of El-Komi and Croson (2013). Gender wise percentages of repayment rates are presented in Table 3 showed that 88 percent of males and 84 percent of females chose PS contract over the IB contract. Under the PS contract, the female subjects registered a slightly higher repayment rate compared to the male subjects, whereas conditional on the IB contract being the choice, the male subjects repaid marginally higher than the females. In the aggregate, it has been found that the enforcement conditions (T2 and T3 treatments) had a positive impact of both male and female subjects.

Table 2

Percentage of Repayment Rate-With Choice of Contract Case

Treatments	With Choice of Contract			
	No. of Participants		Repayment (%)	
	PS	IB	PS	IB
T1	81	13	80	62
T2	81	13	85	77
T3	81	13	91	92
Overall (%)	**86**	**14**	**85**	**77**

Table 3

Percentage of Repayment Rate- With Choice of Contract (Gender Wise)

| Treatments | With Choice of Contract | | | |
	No. of Male Participants	Male Repayment (%)	No. of Female Participants	Female Repayment (%)
P1	44	73	37	89
P2	44	77	37	95
P3	44	86	37	97
Overall (%)	**88**	**79**	**84**	**94**
I1	6	67	7	57
I2	6	83	7	71
I3	6	100	7	86
Overall (%)	**12**	**83**	**16**	**73**

P1=PS-T1, P2=PS-T2, P3=PS-T3, I1=IB-T1, I2=IB-T2, I3=IB-T3

Table 4 gives the results of the McNemar's test for the behavioural differences of the subjects in this session. As it turns out, the differences in the repayment rates across PS and IB contract were not statistically significant. *P-value*s were higher than the level of significance, indicating that the difference between the treatments T1 and T2, and T2 and T3 were not significantly different for either PS or IB contract. For PS contracts, however, there was a significant increase in the repayment rates while comparing T1 and T3 treatment. On the other hand, it was not found in the IB contract.

Table 4

Within Treatment Analysis-With Choice of Contract Case (McNemar's Test)

| Treatments | With Choice of Contract-Within Treatment | |
	McNemar's χ^2	p-value
P1-P2	1.33	0.388
P1-P3	5.40**	0.035
P2-P3	1.67	0.302
I1-I2	0.67	0.688
I1-I3	3.00	0.25
I2-I3	0.20	1

*** $p<0.01$, ** $p<0.05$, * $p<0.1$*

The gender wise repayment differences within the treatments of the contracts using the McNemar's test are depicted in Table 5. The results did not indicate any significant difference in male and female repayment rate for either of the contracts. Thus, the McNemar's test failed to reject the null hypothesis of equality of behaviour across the treatments.

Table 5

Gender Wise Within Treatment Analysis-With Choice of
Contract Case (McNemar's Test)

Gender	Treatments	With Choice of Contract-Within Treatment	
		McNemar'sχ^2	p-value
Male	**P1-P2**	0.50	0.73
	P1-P3	3.00	0.15
	P2-P3	1.33	0.39
	I1-I2	0.33	1.00
	I1-I3	1.00	1.00
	I2-I3	0.00	0.50
Female	**P1-P2**	1.00	0.63
	P1-P3	3.00	0.25
	P2-P3	0.33	1.00
	I1-I2	0.33	1.00
	I1-I3	2.00	0.50
	I2-I3	0.33	1.00

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

3.2. Without Choice of Contract Session

In this session, the subjects did not have the choice over the contracts. Instead, the experimenter allocated the contracts. For this session, a total of 94 subjects; 50 of them were male subjects and the rest of them were female subjects participated.

Of the 94 subjects, 47 subjects including 25 males and 22 females were allocated the PS contract while the remaining 47 were given the IB contract. The proportion of the male and female subjects participating under each of these contracts remained the same. The subjects with PS contract across all three treatments showed a higher repayment rate compared to those allotted the IB contract (Table 6). The behaviour of subjects was quite similar to that of with choice of contract case. Marginally high repayment tendency in female subjects compared to male subjects for both PS and IB contract had been observed (Table 7). These results were also consistent with the results of El-Komi and Croson (2013). However, the gender wise differences in the repayment rates were insignificant. Looking at the effects of enforcement conditions T2 and T3 against T1, we noticed that the outcomes are positive, and similar to that of with choice of contract situation. These positive effects were observed in the overall behaviour of the subjects as well as the gender specific conditions.

Table 6

Percentage of Repayment Rate-Without Choice of Contract

| Treatments | Without Choice of Contract | | | |
| | No. of Participants | | Repayment (%) | |
	PS	IB	PS	IB
T1	47	47	70	60
T2	47	47	77	68
T3	47	47	89	79
Overall (%)			**79**	**69**

Table 7

Percentage of Repayment Rate-Without Choice of Contract (Gender Wise)

| Treatments | Without Choice of Contract | | | |
	No. of Male Participants	Male Repayment (%)	No. of Female Participants	Female Repayment (%)
P1	25	64	22	77
P2	25	72	22	82
P3	25	84	22	95
Overall (%)		**73**		**85**
I1	25	52	22	68
I2	25	64	22	73
I3	25	76	22	82
Overall (%)		**64**		**74**

The results of the McNemar's test in Table 8 and 9 showed significant differences in repayment pattern among T1, T2 and T3 of PS contract ($P < 0.05$), thus, highlighting the significant effect of enforcement and penalty mechanism on subject's repayment behaviour. One could argue that the imposition of penalty in the T3 treatment was responsible for the increase in the repayment rate compared to T1, which did not have any enforcement. The repayment behaviour in the rest of the treatments, i.e., T1 with T2 and then T2 with T3 for both of the contracts were not significantly different at the 5 percent significance level. Furthermore, the gender wise difference across the treatments was also found to be insignificant (Table 9). The repayment behaviour of subjects was similar to the pattern observed in with choice of contracts situation.

Table 8

Within Treatment Analysis-Without Choice of Contract
(McNemar's Test)

| Treatments | Without Choice of Contract-Within Treatment | |
	McNemar's χ^2	p-value
P1-P2	0.60	0.607
P1-P3	5.40**	0.035
P2-P3	3.00	0.146
I1-I2	0.80	0.503
I1-I3	4.26	0.064
I2-I3	1.09	0.405

*** p<0.01, ** p<0.05, * p<0.1*

Table 9

Gender Wise Within Treatment Analysis-Without Choice of Contract
(McNemar's Test)

| Gender | Treatments | Without Choice of Contract-Within Treatment | |
		McNemar's χ^2	p-value
	P1-P2	0.50	0.73
	P1-P3	2.78	0.18
Male	**P2-P3**	1.29	0.45
	I1-I2	0.82	0.55
	I1-I3	3.00	0.15
	I2-I3	0.69	0.58
	P1-P2	0.14	1.00
	P1-P3	2.67	0.22
Female	**P2-P3**	1.80	0.38
	I1-I2	0.11	1.00
	I1-I3	1.29	0.45
	I2-I3	0.40	0.75

*** p<0.01, ** p<0.05, * p<0.1*

3.3. Regression Analysis

The panel logit regression methodology with clustered robust standard errors[11] had been used by including controls for demographics and the religiosity of the subjects. The repayment response of the subjects was used as the dependent variable which took the value 1 when the individual has repaid the loan 0 otherwise.

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[11] Since, there were multiple observations on each of the subject, the clustered robust standard errors model was the appropriate specification.

The following model has been tested separately for both with and without choice of contracts:

$$R_{ijk} = \alpha_0 + C_j'\beta + T_k'\Omega + D_i'\psi + \rho_1 DR_i + \epsilon_{ijk} \qquad \dots \qquad \dots \quad (1)$$

In Equation 1,[12] R_{ijk} denote individual borrower i's repayment response when the contract is j and the treatment is k. whereas, $j = PS, IB$ and $k = T1$-No Enforcement, T2-Enforcement, T3- Enforcement with Penalty.

In these specifications, R_{ijk} are the binary variables and takes the value 1 when the loan was repaid and 0 otherwise. C_j' is the set of contracts *(PS and IB)* and takes the value 1, if the contract j is a PS contract and takes the value zero otherwise.T_k' is the set of treatments T1, T2, T3 and takes the value 1 if subject responded to *kth* treatment of *jth* contract and zero otherwise.D_i' is the vector of demographic variables for the *ith* subject, DR_i refers to the degree of religiosity[13] of the *ith* subject. Finally, ϵ refers to the random error term.

The regression results are presented in Table 10. When the subjects were given the option to select from the given two contracts, i.e., PS and IB, it has been observed that the repayment rates for PS contracts were consistently positive, but not significantly different from the IB contract. There were significant positive effects of T3 on the repayment behaviour of the subjects. Interestingly, the education and the income level showed significant negative effects on the repayment rate implying that those with higher levels of education and income were more likely to default than those with lower levels of income and education. However, the coefficients of experience and degree of religiosity were positive and significant at the 5 percent level, indicating that experienced and religious subjects were more likely to repay their loans. The results for without choice of contract case showed statistically insignificant differences in the repayment rates under PS and IB contracts. While the coefficients for T2 and T3 treatments were positive, the coefficient for T2 treatment was insignificant whereas that of the T3 was statistically significant reflecting a positive impact of repayment behaviour of the subject. In case of gender difference, the female repayment coefficient was statistically significant showed that female repaid more. The effect of education was insignificant but higher skills and experience resulted in a significantly lower repayment rate means that subjects with higher

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[12] We used the following coding arrangement for the variables.
Loan Repayment Response*: Repaid = 1, Default = 0,* Contract*: PS=1, IB=0,* Gender*: Male = 1, Female = 0,* Marital Status*: Single=0, Married=1, Divorced=2, Separated=3,* Education*: Illiterate=0, Primary=1, Middle=2, Secondary=3, Higher Secondary=4, Diploma=5, Graduation=6, Post graduation=7,*Residence*: Nil=0, Parents/ Husband Owned=1, Self Owned=2, Rented=3, Land=4,* Skill level*: Unskilled=0, Skilled=1,*Transport*: Nil=0, Bicycle=1, Motor Cycle=2, Scooter=3, Car=4, Public Transport=5,*Degree of Religiosity*: Atheist (Not religious) = 0, Weak religious = 1, Moderate religious = 2, Strong religious = 3.*
[13] For the measure of degree of religiosity see Appendix-2.

skills and experience were more likely to default. The degree of religiosity had a significantly positive effect on the repayment behaviour of the subjects. This result, thus, reinforced the findings of El-Komi and Croson (2013).

To summarise, the study found a significant and a high degree of preference for PS contracts given the high take up of PS contracts when the subjects could choose between the contracts. The difference in the repayment rates in these two sessions (choice vs. no choice), however, was insignificant. It has also been found that the repayment rates for females were significantly higher than that of the males. Religiosity of the subjects remained a significant positive factor affecting the repayment behaviour.

Table 10

Panel Logit Regression of Repayment Rate

Variables	With Choice of Contract			Without Choice of Contract		
		Including Demographics	Including Religiosity		Including Demographics	Including Religiosity
PS Contract	0.415	0.182	0.0962	0.535**	0.397	0.320
	(0.270)	(0.314)	(0.308)	(0.215)	(0.295)	(0.322)
Enforcement-T2	0.236	0.267	0.274	0.352	0.378	0.431
	(0.166)	(0.183)	(0.209)	(0.416)	(0.447)	(0.517)
Enforcement with Penalty-T3	0.550***	0.618***	0.637**	1.061**	1.129**	1.269**
	(0.191)	(0.210)	(0.249)	(0.442)	(0.473)	(0.561)
Gender		-0.662***	-0.733***		-0.847**	-1.007**
		(0.237)	(0.248)		(0.366)	(0.444)
Age		0.00692	0.00768		0.0189	-0.00149
		(0.0189)	(0.0212)		(0.0248)	(0.0281)
Marital status		0.230	0.141		-0.404	0.274
		(0.313)	(0.263)		(0.335)	(0.395)
Education		-0.164	-0.213**		0.109	0.00485
		(0.110)	(0.0970)		(0.114)	(0.111)
Family Size		0.0539	0.0259		-0.0331	-0.0284
		(0.0463)	(0.0432)		(0.0499)	(0.0511)
Income		-1.171***	-0.766*		-0.0399	-0.0768
		(0.386)	(0.419)		(0.120)	(0.112)
Residence		0.0708	0.117		0.0242	-0.127
		(0.177)	(0.186)		(0.310)	(0.275)
Skill Level		0.0660	0.0720		-0.649***	-0.557***
		(0.267)	(0.274)		(0.235)	(0.184)
Experience		0.227***	0.141**		0.0294	0.0215
		(0.0719)	(0.0693)		(0.0592)	(0.0637)
Transport		0.128	0.104		0.0873	-0.0889
		(0.0871)	(0.0820)		(0.0862)	(0.0969)
Degree of Religiosity (DR)			0.501***			0.816***
			(0.142)			(0.181)
Constant	0.412	11.60***	6.990*	0.357	1.190	0.864
	(0.261)	(3.858)	(4.249)	(0.382)	(1.452)	(1.628)
Observations	282	282	282	282	282	282

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

4. CONCLUSION

This paper explains the comparative analysis of two microfinance contracts PS and IB. The contract designs were identical to that used by El-Komi and Croson (2013) but an artefactual laboratory setting was used with the subjects from the poor community of a semi-rural town in Pakistan instead of student subjects in a classroom/ laboratory situations. The main contribution is the introduction of a treatment in which the subjects had the choice between the two contracts, PS and IB. A major finding was that the majority of subjects in the experiment showed a strong preference for using the Profit Sharing contract over the interest-based contract. This result is probably expected in a country like Pakistan where the majority of the population is Muslim with strong religious sentiments against the interest based contracts. Interestingly, the repayment rates in PS contract were marginally higher than that of IB contract even though the differences were statistically insignificant. Positive impact of the enforcement conditions (T2 and T3) on the repayment behaviour in comparison to the no enforcement condition T1 was observed. This explains that enforcement threat in T2 and imposition of penalty in T3 for false reporting of project outcome positively affected the repayments and such treatments had the tendency to affect the subject behaviour in case of information asymmetry on the part of lender. In case of gender difference in repayment behaviour, the repayment rates for females were significantly higher. This also satisfies the existing literature that female subjects perform better than the male subjects. Overall, the repayment rates did not show significant variations across with choice and without choice treatments of the experiment. However, the by offering the choice of contract will attract those microfinance borrowers who were keeping them away from the microfinance programs due to the interest on loan.

This study suggests quite strongly that individuals have an innate preference for borrowing under the PS contract. While the reasons for such preferences may stem from religious motivation, it also appears to us that the contractual structure of PS in which the borrowers have to pay in case of a success may be perceived as more fair compared to an interest-based contract. This contractual difference, thus, created a higher level of motivation for the borrowers to comply with the loan conditions under PS. One problem associated with the use of the PS contract at the ground level is the problem of information and the associated costs require verifying the actual state. Our experiments, however, suggested that the other things the same, the subjects have a strict preference to use PS contracts and this preference may be an important factor in increasing the take up rates of microfinance loans.

Like any experimental study this study also has some limitations. Such as, it was confined to the lab in the field settings. Although, the subjects were the potential microfinance borrowers from the general public rather than students

but still there is need to test these contracts in the field where borrowers/ subjects would receive enough time to invest in the project (at varying degrees of risk). In this way, it would help in understanding the effect of social interaction affecting their repayments and effective monitoring can be carried out of their counterparts as the stakes for everyone in the will be eminent. More importantly, in the actual field the borrowers would have sufficient time to follow the effect of his investment and he would be able to put his true effort and the group members/ partners can also keep a record of their effort level.

Finally, this study suggests that higher cost of state verification by the lenders is not a serious problem, as it has been observed that at least 60 percent of the subjects had repaid their loans in the case of no enforcement. Further, it can provide a new dimension for the researcher to discuss the microfinance contracts from the borrower's perspective. It will be helpful in driving the attention of MFIs and microfinance banks to diversify their contract pool by offering borrowers the opportunity to choose the products they prefer for their planned investment. Eventually, this will significantly help in increasing the take up rates with fewer defaults and higher compliance.

APPENDIX-1

MINIMUM ELIGIBILITY CRITERIA FOR THE POTENTIAL MICROFINANCE BORROWERS IN ARTEFACTUAL FIELD EXPERIMENT IN PAKISTAN

(1) Applicants may be male or female.
(2) Applicants should be over 18 years of age.
(3) Applicants should have been residing in the program target area for at least last two years.
(4) Applicants should not be involved in activities considered criminal or immoral.
(5) Applicants may be from any ethnic group.
(6) Applicant must have NADRA[14] (Pakistani) identity card.
(7) Applicants should be those considered as "relatively poor" or from other vulnerable section of the population (such as widows, registered disabled, etc.).
(8) Applicants should accept and abide by the terms and conditions of the loan.
(9) There should not be more than one loan held by a household at any one time.
(10) Applicants should possess some relevant business and management skills.

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[14] NADRA refers to National Database and Registration Authority, Government of Pakistan.

APPENDIX-2

PARTICIPANTS DETAILS
(Artefactual Field Experiment in Pakistan)

1.   NAME   _____

2.   EDUCATIONAL QUALIFICATION _____

3.   SEX (M/F) _____

4.   MARTIAL STATUS _____

5.   AGE   _____

6.   No. Of FAMILY MEMBERS_____

7.   PROPERTY_____

8.   SKILL LEVEL   (i) SKILLED   (ii) UNSKILLED

9.   EXPERIENCE (Years)_____

10. MEANS OF TRANSPORTATION_____

11. INCOME/POCKET MONEY Rs: _____

12. SUBARB/ CITY /POSTCODE_____

13. NATIONALITY_____

14. RELIGION _____

15. DEGREE OF RELIGIOSITY (Select any one out of the given options below).

Degree of Religiosity	Criteria	Grade
Not Religious	Not prayer Salat at all and not reciting Quran	0
Weak Religious	Praying Jumma Salat only and reciting Quran very Occasionally.	1
Moderate Religious	Must praying Salat on Jumma but not been regular in daily prayers and reciting Quran on Once or twice a week.	2
Strong Religious	Praying Salat regularly 5 times a day (or can miss one Salat a day only) and reciting Quran once a day.	3
Very Strong Religious	Praying Salat regularly 5 times a day (Never miss a single Salat), reciting Quran with every Salat.	4

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