

## Homogeneity, Peer Monitoring, and Group Size on Joint Liability Lending Costs

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### Abstract

*This paper aims to present evidence based on experimental method on the causal relation between homogeneity, peer monitoring (fatwa), size, and cost of non-repayment in Joint Liability Lending (kafalah). Given mixed findings and the importance of this issue to cost managerial, it is important to understand the condition under context to improve repayment rate and reduce cost of non-repayment. This finding provides a mechanism for reducing cost of non-repayment in Joint Liability Lending (kafalah). This study designed to find out the impact of homogeneity, peer monitoring (fatwa), and group size on cost of Joint Liability Lending (kafalah). Data for this research were collected by conducting laboratory experiment with pre-test post-test control group design. The research findings shows homogeneity, peer monitoring (fatwa), and affect cost of non-repayment. This findings should be considered when develop Joint Liability Lending (kafalah) policy.*

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### 1. Introduction

Microfinance institutions are an important part of the economy at the grassroots level, both in urban and rural areas. Microfinance institutions play an important role in meeting the capital needs of SMEs (Haryanto, 2011; Abara & Banti, 2015; Amsi et al., 2017; Geoffrey & Emenike, 2018); Paramita & Zulkarnain, 2018; Santoso, 2020; and N'Guessan & Hartarska, 2021). The existence of microfinance has been able to become an alternative source of capital for SMEs. microfinance is able to improve the performance of SMEs (Amsi et al., 2017; Worokinasih & Potipiroon, 2019; Moussa, 2020; Zhang & Ayele, 2022; Jelena Šišara & Šarlija, 2023; and Agaba & Mugarura, 2023).

Microfinance institutions apply a more flexible system of credit services to the community. The community tends to have limited access to bank institutions. The flexibility of microfinance institutions is a form of service that suits the needs and conditions of the middle and lower classes.

Lenders are always faced with credit risk. High credit risk will result in decreased performance. Microfinance institutions are faced with high risk in lending. So that microfinance institutions try to reduce risk. The joint liability loan system is one way to reduce risk (Baag & Malhotra, 2022; Ranabahu & Wickramasinghe, 2022; Cao et al, 2023; Pratiwi et al., 2023; and Pratiwi & Yulita, 2023). The results show that joint liability loans have advantages over individual loans. This mechanism reduces three main problems. These problems are: (1) moral hazard problem, which is the proper utilisation of the loan, (2) adverse selection, which is the risk of not paying as a member, and (3) law enforcement, which is a self-pressure mechanism. This mechanism is widely used by microfinance in developing countries. The group members are jointly and severally liable for each member's loan. Therefore, when a member defaults on the loan, it will be a threat to the social bond. In this mechanism, the group as social capital can replace or reduce physical collateral (Wydick, 1999;

Attanasio et al., 2015; Postelnicu & Hermes, 2018; Gutiérrez-Nieto & Serrano-Cinca, 2019; Nogueira et al., 2020; and Sangwan et al., 2021).

A number of reserachs shows that joint liability loans has an advantage over individual loans. This mechanism mitigates three major problems. These are: (1) moral hazard problems, it makes proper utilization of loans, (2) adverse selection, risk of non repayment as a member, and (3) enforcement, pressure mechanism is self willed. This mechanism is widely used by microfinance in developing countries. The members of group are jointly liable for each member loan. For that, when individual member fails to repay loans, he/ she would pose a threat to social ties. In this mechanism, group as social capital may be able to replace or reduce the physical collateral (Wydick, 1999).

Poor and low-income individuals face challenges in accessing formal credit due to limited means for lenders to screen applicants, track fund usage, and ensure repayment. Recently, many development organizations have turned to group lending to extend credit to these demographics. Additionally, group loans assist traditional lenders in overcoming the high fixed costs associated with providing small loans. While monitoring and enforcement are distinct concepts, they are challenging to differentiate empirically. Monitoring doesn't guarantee repayment but aids lenders in identifying those accountable for non-repayment. Despite the potential, commercial banks find it difficult and expensive to monitor borrowers' business and personal outcomes. Group lending schemes incentivize borrowers to mutually monitor repayment abilities. Monitoring methods vary, including observing loan repayments, verifying business operations, providing receipts for purchases, and confirming community-reported incidents like illness.

Joint liability method is frequent and massive occurs for the absence of collateral. Most of poor citizens perceived collateral is the major impediment to access credit from financial institution. They are cannot ascertain risk type or non-repayment risk of borrower. For that, joint liability loans could help financial institution for reduces its risk.

In islamic financial institution, Joint liability method (*kafalah*) is the guarantee for a loan for poor citizens must be repaid by all members in group and in due course according to Islamic law. For that, *kafalah* is "Unify the responsibility of the guarantor to the responsibility of the person guar-

anteed in the commitment to perform the compulsory rights, either at that time or in the future"

Cost of non-repayment in financial institution is primary problems. This cost will reduces profit of organization. Based on previous studies, this cost will reduces about 80-95 per cent nonpayment rate (Chauhan and Verma, 2001; Puhazhendi and Badatya, 2002; Ferozea et al., 2011; Shaikh & Kadam, 2017; Hundekar, 2020; and Hundekar & Munshi, 2020) when it is a community-based participatory approach. It proves that that group lending reduces non-repayment cost.

The empirical work in joint liability has lagged relatively far behind. Large body of evidences in *Joint Liability Lending (kafalah)* indicate that it does not improve repayment rate (Attanasio et al., 2015). However, based on *Joint Liability Lending (kafalah)* experiment in five countries: India, Kenya, Guatemala, Armenia, and the Philippines shows that societal trust positively and significantly influences repayment rates (Cassar and Widdyick, 2010). Given mixed findings and the importance of this issue to cost managerial, it is important to understand the condition under context to improve repayment rate and reduce cost of non-repayment. Consequently, it is important for investigating factors that may attenuate the impact of social capital on cost of non-repayment.

This paper is to attempt to give empirical evidences for providing recommendations for cost managerial. This paper focuses to provide evidence on the relation homogeneity, peer monitoring (*fatwa*), and group size on cost of non-repayment.

This study focuses on context as possible explanation for mixed result on previous studies such as social homogeneity (Floro and Yotopolous, 1991; Besley and Coate, 1995; Zeller, 1998; Wydick, 1999; Cassar et al., 2007) and peer monitoring (*fatwa*) (Stiglitz (1990), Banerjee et al. (1994), and Wydick (2001). These contexts are important variables to study in management control system. First, it is likely that performance of repayment rate depends on varying on social homogeneity. Second, it also most of managerial topic in monitoring and retaliation. Third, it is likely that cost of non-repayment depend on group size.

In Indonesian context, the empirical study in joint liability loan has lagged relatively far behind. Based on contingency approach that suggests the applicable of managerial system is dependent on the context of the situation and the process of adoption. In Indonesia, based on 35.9% of the country population, it is lowest bankable populations in the

world (DBS Bank, 2017). Finally, it is important for conducting in Indonesia contexts. The remainder of this study organized as a follow. First, it discusses theory and hypothesis regarding how homogeneity of social, peer monitoring (*fatwa*), and group size are likely to affect cost of non-repayment in *Joint Liability Lending (kafalah)*. Next, it review studies of *Joint Liability Lending (kafalah)* and develop hypotheses based on social homogeneity and type of peer monitoring (*fatwa*). Second, it discusses method for conducting experiment. Third, it discuss result of this research. In the final section, it provides conclusion.

Homogeneity of group members, effectiveness of peer monitoring, and group size significantly influence joint liability lending costs. We hypothesize that more homogeneous groups with efficient peer monitoring mechanisms and optimal group sizes will result in lower lending costs due to enhanced risk management and accountability.

The objective of this study is to investigate the impact of homogeneity, peer monitoring effectiveness, and group size on joint liability lending costs. By examining these factors, we aim to provide insights into how the composition of lending groups and monitoring mechanisms affect the overall costs associated with joint liability lending. This research seeks to contribute to the understanding of factors influencing lending costs in joint liability schemes, thereby informing policymakers and financial institutions in designing more effective lending strategies.

## 2. Hypothesis Development

### Theory of Planned Behavior

Theory of planned behavior (TPB) is relevant for describing joint liability loan repayment. Based on this theory, Ajzen (1991); Ajzen (2020); Hagger et al. (2022); and Lim & Weissmann, 2023) point out that human behavior is guided by three considerations such as behavioral beliefs, normative beliefs and control beliefs. Behavioral beliefs describes consideration about results of the behavior, normative believe about expectations of other people (members or group), and control beliefs describes about factors that may affect behavior performance.

Francis et al (2004); Cooke et al., 2016; and Dorce et al. (2021) explains that attitude of members towards the behavior, subjective norms, and perceived behavioral leads to behavioral intention and behavior. Makorere (2014) used this theory for identifying the relationship between the theory of

planned behaviour and borrowers' behaviour .This mechanism could be described as a figure 1.

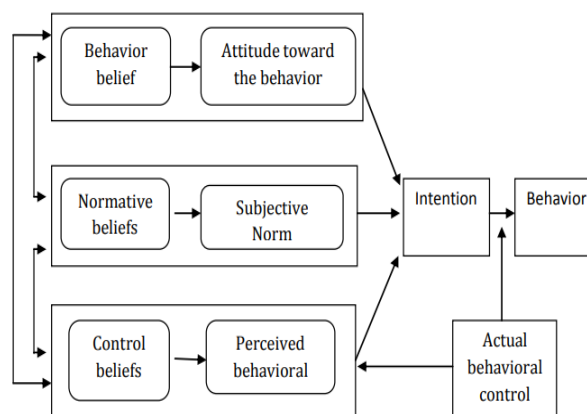


Figure 1. The Planned Behavioral Model (Source: Francis et al., 2004)

### Type of Social Homogeneity

Homogeneity of groups increases level of social capital and group loan repayment. It is critically important for making interpersonal trust, which leads successful group borrowing. Based on social identity theory (McLeod, 2008); (Mangum & Block, 2018), Tian et al (2023) person's sense of membership of group. This sense from its homogeneity such as social class, family, and hobbies (Tajfel (1979). Identity of this group could be important sources of self-esteem or pride. For that, it argue that the search for social identity is categorized based in-group homogeneity relative to out-group perception. It consistent with finding of previous research, which indicated that members are perceived more homogeneity in-group than out-group.

Strong homogeneity have high potential for sanctions for every group members, hence it help mitigate moral hazard problems in *Joint Liability Lending (kafalah)* (Cassar et al., 2007). Cassar found that clan homogeneity in South Africa has significant negative effect on group cost of loan repayment. The finding support that group homogeneity fosters repayment rates of group.

Based on Gilster & Watson (1999) experiment, it also found that societal trust (homogeneity group) significant positive influences group loan repayment rates. Test for its homogeneity based on greatest social divisions in each country. In Armenia (Gilster, P., & Watson, 1999) categorized group into pre- and post-Perestroika generations. In Guatemala, homogeneity based on their town or residence such as San Pedro Atitlan and San Juan Atitlan. Besides that, groups that were homogeneously also categorized based on religion such as Catholic, homogeneously Evangelical, and mixed

groups with three of each. That group homogeneity will reduce the risk of loan non-repayment (Al-Azzam et al., 2020; Kitomo et al., 2020; Msangi, 2021; and Pilatin & Ayaydin, 2022). Based on previous explanation, first hypothesis as stated below:

H<sub>1</sub>: Homogeneity of groups' members leads to a lower cost of joint liability non-repayment.

### Type of Monitoring

Peer monitoring (*fatwa*) could increase social capital level. Based on theory of peer monitoring (*fatwa*), group members have an incentive to control partner who misuses her loan. It could be concluded that in joint-liability lending also reduces non-repayment cost. Peer monitoring (*fatwa*) consists of two types, (1) direct peer monitoring (*fatwa*), it occurs when borrowers correct their team member who makes mistakes, (2) indirect peer monitoring (*fatwa*), it occurs when borrowers gossip about non-performing peers. Peer monitoring (*fatwa*) occurs when members of group notice and respond to their peers' behavior or performance. For that, peer monitoring (*fatwa*) has a negative association with non-repayment cost.

Peer monitoring (*fatwa*) between group members could reduce moral hazard and cost of non-repayment. As stated by DBS Bank (2017) Stiglitz (1990), Banerjee et al. (1994), and Wydick (2001) which indicate posit that peer monitoring (*fatwa*) in *Joint Liability Lending (kafalah)* helps mitigate the hidden action in credit transactions. Cassar and Wydick (2010) carried out empirical studies and found that peer monitoring (*fatwa*) is an effective tool in Guatemala and Philippines.

About 80-95 per cent recovery rate Chauhan and Verma (2001; Puhazhendi and Badatya (2002) when it is a community-based participatory approach with high level of peer monitoring (*fatwa*). It proves that that group lending reduces non-repayment cost. Some studies show that peer monitoring (*fatwa*), group size and female percentage have a negative influence on cost of non-repayment (Feroze et al., 2011; Kritikos and Vigenina, 2005). Peer monitoring (*fatwa*) reduces cost of joint liability non-repayment (Ananth, 2020; Malhotra & Baag, 2021; and Cornée & Masclet, 2022). Based on previous explanation, second hypothesis as stated below:

H<sub>2</sub>: Peer monitoring (*fatwa*) reduces cost of joint liability non-repayment.

### Type of Group Size

Third hypothesis in this study discusses about role type of group size interact with group lending influences cost of non-repayment. Group size defined as number of people in the group. The hypothesis for this type is difference-monitoring effectiveness between small group and big group. The bigger group, the flow of information is imperfect; the cost of monitoring is higher. For that, cost of non-repayment in big group is higher than small group.

The impact of group size on repayment rate (cost of non-repayment) has been investigated first by Isaac et al. (1994). His research finds that contrary to the common hypothesis. This finding is similar to Carpenter (2002). In both studies, social benefits increase hugely as the group size increases. Sharma dan Zeller (2007); and Singh & Gupta (2022) found that impact of group size is positive and marginally significant on cost of non-repayment. Based on previous explanation, third hypothesis as stated below:

H<sub>3</sub>: Group size reduces cost of joint liability non-repayment

## 3. Data and Methods

### Sites and Subject

This experiment was carried out in class. Subject for this study were practitioners student in Kalbis Institute. Using students as experiment participant consistent with Liyanarachchi and Milne (2005) that indicated students can be used as professional managers. Participants should have completed cost accounting and managerial accounting.

The research argument is that the majority of behavioural research only focuses on how individuals process information and make decisions in general so that students produce the same results as professional managers. The experimental tasks in this study is simple. Hence, student is valid for this study.

This experimental research design is pre-test post-test control group design within subject, with three manipulation such as homogeneity, peer monitoring (*fatwa*), and group size. The minimum number of participants (sample size) for each experimental group is 15 subject (Mohajan, 2020). Therefore, the number of participants involved in this experiment is 15 within subject. The grouping of participants into each experimental cell is done

randomly using excel software. Randomization results high level of internal validity of experiment.

### Experimental Design and Procedure

The joint lending experiment that we employ in this research is the joint lending game which developed by Cassar and Widyck (2010) with some minor modifications and adjustments for Indonesian context. Experiment using games is chosen for this research based on three important consideration of group lending: (1) it incorporates dynamic incentives, group members tend to repay group loans for accessing future opportunity loans. (2) It considers moral hazard, difficulty in repayment even members obtain sufficient return from their investment, and (3) the structure of the game considers private information; investment loss is members information.

The Design for this experiment is pre-test post-test control group design. It has three types for treatment (homogeneity, peer monitoring (*fatwa*), and group size). For that, it can be described as a table 1.

Table 1. The Design for this experiment

Group	Pre Test	Treatment	Post Test
Treatment	O1	Homogeneity, Peer monitoring ( <i>fatwa</i> ), Group Size	O2
Control	O1	-	O2

Consistent with Cassar and Widyck (2010), the experimental consisted of a circle of chairs which participants facing away from each others. The experimenter explain clearly instruction of the game, answered some questions from members, and give one trial, and asking some questions to ascertain their understanding.

In this experiment, each group consist of six members. Every members is given loan equal to IDR 100.000. This created joint liable for IDR 600.000 which group must repaid at 50% interest for a total repayment is IDR 900.000. Success investment (green ball), participant will receives IDR 300.000. Negative shock investment (red ball), participant will lose their principal.

In control condition, each participant has chance for drawing one ball from black bag, which contains six colored ping-pong balls, five green, and one red. After draw one ball, notes the color of the ball with the experimenter, and then returns the ball to the bag. The color of the ball is written on a card held by participant. The color of ball is only knew by the experimenter and the individual participants. After all six participants have drawn their

balls, they should write their contribution to repay the joint liability loan. If the participants draws a red ball, they loses their principal and cannot repay their loan. If they draw and receive a green ball, they must choose whether to repay the joint liability loan or not by displaying their decision card to the experimenter. Their decision as a consideration for their next group loan. This condition for inducing moral hazard and private information.

In condition for homogeneity, each member should state clearly his or her ethnic and his or her party. This statement for showing their homogeneity. Based on (Cassar and Widyck (2010) treatment on homogeneity, it should be perceived as the greatest social divisions in every context. In Indonesia, ethnic and age is important social division. As stated by (Goebel (2013) that Ethnicity is pervasive social division that typically points to a particular region and particular language. Party is also source cleavage in Indonesia (Gilster & Watson, 1999). Consistent with (Gilster & Watson, 1999) which argue that a cleavage involves a social division that distinguishes between groups.

In condition for peer monitoring (*fatwa*), the chairs of participant faced inward. Every group members know color of balls drawn. Inward position induces peer monitoring (*fatwa*), every group members know and observe other group members investment result. After all participants draw the balls, the experimenter elicited member's contributions by having flip cards held by members to withhold or contribute. Participant could change their decision in response to the other group member's decisions until ash equilibrium, the point where no members of group has an incentive to deviate their strategy after observing other members choice. This process usually took one minute.

In condition for group size, contrary to control group, which consist of participant, treatment group (small group), consist of three members. Using same loan for different group size, it predict that contribution of every members is different. Using small size is smaller than 5 participant consistent with (Gilster & Watson, 1999) Theall et.al (2010) which using < 5 participant for exploring the impact of group size. For that, in this group Rp. 720.000 repayment is divided to 2 participant who success in their investment.

Dependent variables in this study is cost of non-repayment. This variables is calculated as the ratio of its not contribution participant of its total members. For instance, if a group has six borrower in the group and generates two person who do not

contribute, its cost of non-repayment would be 2 member/ 6 members = 0.33 or 33 %.

#### 4. Result

##### Manipulation Checks

As a check on the every manipulation, participants asked related to homogeneity of group, group size, or monitoring. Participants required to answer, do you know color of ball drawn by other member and how many your group members. The participants who failed the manipulation check are exclude from analysis. The manipulation check is tool for determining the effectiveness of treatment in an experimental design. All participants answered the question correctly.

##### Descriptive Statistic

Table 1 presents the descriptive statistics for characteristic of participants based on their absence in joint liability loans contribution. It reports that average for every treatment, control group mean value is 0,689. It also inform that average for homogeneity is 0,278, peer monitoring (*fatwa*) is 0,322, and group size is 0,489. Based on descriptive table, it could be concluded that context of *Joint Liability Lending (kafalah)* (homogeneity, peer monitoring (*fatwa*), and group size) is different from control group (absence of treatment). For that, context is very important for developing joint liability loan policy. Based on mean scores which decline from 0.688 (control) to 0.278 (homogeneity), 0.322 (Peer monitoring (*fatwa*)) 0.489 (Group Size), it could be concluded that such mechanism (context) is efficient tools for reducing cost of non-repayment.

Table 1. Descriptive Statistic

	Value Label	N	Mean	Std. Deviation
Treatment 0	Control	15	.689	.188
1	Homogeneity	15	.278	.103
2	Peer monitoring ( <i>fatwa</i> )	15	.322	.133
3	Group Size	15	.489	.172
	Total	60	.444	.221

##### Test of Hypothesis

Table 2 presents the analysis of variance (ANOVA) results that provide information effect of treatment variables. Based on this result, context of joint liability loan (homogeneity, peer monitoring (*fatwa*), and group size) has significant impact on cost of non-repayment (Sig. < 0, 05). It is consistent

with descriptive statistic that shows mean scores decline from 0.689 (control) to 0.278 (homogeneity), 0.322 (Peer monitoring (*fatwa*)) 0.489 (Group Size), it could be concluded that such mechanism (context) is efficient tools for reducing cost of non-repayment. Finally, context is important factor for reducing cost of non repayment.

Table 2. ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1.567 <sup>a</sup>	3	.522	22.432	.000
Intercept	11.852	1	11.852	509.091	.000
Treatment	1.567	3	.522	22.432	.000
Error	1.304	56	.023		
Total	14.722	60			
Corrected Total	2.870	59			
R <sup>2</sup>	.546				
R <sup>2</sup> <sub>adj</sub>	.521				

Table 3 shows multiple comparison for confirming the planned hypothesis. This table provides comparison for every group. Hypothesis 1 predicts that homogeneity is matter in of participants contribution on joint liability loan repayment. Based on table 3, it could identify that cost of non-repayment is statistically significant different between treatment group (homogeneity and control group). This significance is 0. 000 (Sig. < 0.005).

Table 3. Multiple Comparison Result

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.
Control	Homogeneity	.4111*	.0557	.000
	Peer monitoring ( <i>fatwa</i> )	.3667*	.0557	.000
	Group Size	.2000*	.0557	.004

#### 5. Discussion

##### Homogeneity of groups' members leads to a lower cost of joint liability non-repayment.

The results show that group homogeneity has an effect on non-payment. The stronger the homogeneity, the more inability to pay. This shows that group homogeneity as a form of social capital will be able to reduce the inability to pay. The joint responsibility system will have an impact on the sense of solidarity of members, to support and help

each other. This will have an impact on good business development, so that it will increase the ability to pay higher and higher. Group homogeneity results in a higher contribution rate to the group's loan obligations. The findings of this research support the results of research from Cassar et al. (2007); Susanna Khavu (2010); Mardliyyah & Ryandono (2020); Nogueira et al. (2020); and Fadhil & Ropei (2022).

### **Peer monitoring (*fatwa*) reduces cost of joint liability non-repayment**

The results showed it finds that in peer monitoring (*fatwa*) treatments yield a significant improvement in repayments rates or group performance. The results showed that peer monitoring had an impact on reducing the inability to repay joint loans. This is because the higher the peer monitoring carried out by the group, the more likely there will be a sense of embarrassment. This high peer monitoring is a form of social capital that exists in the community. With strong peer monitoring, each member will try to keep paying the joint loan. The stronger the monitoring, the stronger the social capital in a community. This finding in line with previous theoretical work on *Joint Liability Lending (kafalah)* (Stiglitz, 1990; Banerjee et al., 1994; Kumar, 2012); Maurya, 2016); Hendri, 2017); and Malhotra & Baag, 2021) which suggested that peer monitoring (*fatwa*) and low asymmetric information induces high flow of information between members. It leads socially cohesive societies that be an important role in reducing non-repayment loans.

### **Group size reduces cost of joint liability non-repayment**

The results show that group size is effective in reducing the cost of joint liability (*kafalah*) loans that cannot be repaid. The results of this study indicate that the smaller the group, the greater the supervision and responsibility of group members. With the greater responsibility of each member will have an impact on reducing the inability to pay. The responsibility of each group member will be greater, along with the smaller members of a group. Conversely, with a larger group, the sense of responsibility of group members towards the group will be lower.

Based on statistical result for determining the existence of differences between group size (3 members) and control group (6 members) is statistically significant. For that, it could be concluded that small group is effective for reducing cost of *Joint Liability Lending (kafalah)* non repayment.

This result consistent similar (Gilster & Watson, 1999; Ferozea et al., 2011; Rathore et al., 2022; and Kiros, 2022) found that impact of group size is positive and marginally significant on cost of non-repayment. For that, this finding contrary to (Gilster & Watson, 1999) argumentation that stated that social benefits increase hugely as the group size increases.

## **6. Conclusion and Suggestion**

### **Conclusion**

The results show that homogeneity is important in the collective lending game, participants have an incentive to contribute if they believe that their group has the same background. Therefore, homogeneity boosts repayment rates and reduces non-repayment costs because the borrower group performs better. The research results show that the ability of group members to monitor other members in a Joint Loan group (*kafalah*) has a positive effect on the rate of return. Group size has an important influence in reducing non-repayment costs. Small groups make monitoring easier so they can reveal asymmetric information and reduce the moral hazard of group members.

### **Suggestion**

The experimental design in this study has limitations on experimental participants. The subjects in this study were working university students. Participants may be novices in shared responsibility lending and they have no borrowing experience. Therefore, it cannot be generalised to expert borrowers. However, the findings of this experiment capture the impact of context on the cost of shared responsibility in the absence of repayment.

This finding has major implications that context of mechanism (homogeneity, peer monitoring (*fatwa*), and group size) is regarded in the joint liability loan. It has significant implications for developing a financial inclusion policy especially for unbanked population. As known that financial inclusion is important because it gave individuals and businesses to access affordable financial products for their needs such as payments, credit, transaction, and insurance. Thus, this evidence suggest that regulators considers context when develop joint liability loan policy. Finally, these findings gave significant contribution for joint liability loan policy development.

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