

# Impact of Peer Monitoring on Sustainability of The Self-Help Groups

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## Abstract

This research paper aims to analyze the role of peer mechanisms and social contracting in ensuring access to loans and finance for marginalized poor through self-help groups. From the analysis of the results, we find that joint liability and social capital in a group lending scenario facilitate financial inclusion. A group that has joint liability through information sharing facilitates peer selection and assortative matching to ensure the formation of groups of only low-risk borrowers. As per the research study, joint liability groups or self-help groups help reduce the risk of adverse selection at the selection stage and moral hazard at the contract performance stage. This paper establishes that peer monitoring and peer selection in matching the risk type of the borrowers, particularly in the case of high-risk borrowers, help reduce the risk of adverse selection.

Keywords: Self-Help Group, Moral Hazard, Adverse Selection, Information Asymmetry

JEL Classification: G21, G20

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## 1. Introduction

Globally there are 1.7 billion people financially excluded (Demirguc-Kunt et. al, 2018), and these people lack physical collateral and access to formal financial institutions that do not have information about their creditworthiness of these people. Due to the higher cost of screening and monitoring the members, lending to the marginalized poor leads to asset deterioration and increased non-performing assets. (Stiglitz, 1990) further argues that the critical reason for money lenders' success in rural areas is the inability of the banks to serve the marginalized poor due to the lack of collateral and creditworthiness information. Thus, social innovations such as Social capital and group lending have emerged as a panacea to the problem of exclusion of the poor. Within Durkheim's Social Theory is embedded the concept of joint liability groups or group lending based on social capital and social collateral. Social capital refers to institutionalized relationships among poor people based on trust, social ties, and norms (Ito, Sanae, 2003). Information asymmetry can lead to adverse selection, referred to as selecting the high-risk borrowers (Jensen and Meckling, 1976) External lenders know less about the group members, and the groups are the repositories for information on the members' creditworthiness of the group. Peer selection by the members is an excellent technique to address the issue of adverse selection. To a certain extent, existing literature highlights the positive financial outcomes of group mechanisms, (Malhotra & Baag, 2021; Besley, T., Coate, 1995) have highlighted the importance of peer sanctions and the importance of peer selection and assortative matching, and risk matching in addressing the problem of adverse selection. This paper examines the factors that improve and positively impact loan repayment in a group lending scenario

## 2. Literature Review

A theoretical model in the domain of group lending addresses the problem of designing the social contract so that within the framework of joint liability, the borrowers have the incentive to repay the loans. (Stiglitz, 1990 ), in his research study highlights that group lending helps in mitigating the adverse selection problem. (Vigenia, 2005) Their research study highlights that the borrowers know each other before joining the group, which helps reduce the risk of willful default on loan liability. Due to joint liability, the members are responsible for the loan default of every other member in the group. Banks do not have any information about the creditworthiness of the poor and are wary of investing in screening due to Mission drift. This works as a dynamic incentive to choose only members known to the other members, reducing the risk of moral hazard. Thus, with apriori information, low-risk borrowers will group only with low-risk ones, and high-risk borrowers will group only with high-risk ones. This reduces the instances and the probability of adverse selection of the group members, which helps raise the repayment rates of loans. (Ghatak and Guinnane,, 1999; Ahlin & Townsend , 2007 ) examines the role of screening, monitoring, group pressure, self-selection, and social ties on group repayment behavior. (Ghatak, 2000) in their study, that group will be formed of homogenous members with similar risk types. And this joint liability cannot be greater than the individual loans. (Guttman, 2008) their research study highlights the risky borrower's group with the risky borrowers and the safe borrower's group with the safe borrowers. Thus, the

existing literature highlights the role of peer mechanisms and group dynamics in mitigating the information asymmetry problem in the form of moral hazard and adverse selection among poor borrowers.

### 3. Research Methodology

#### 3.1. Research problem

There is a lack of empirical study about how the peer mechanism and dynamic incentives in a group lending scenario, in reality, help in improving repayment behavior. Our main argument from the earlier literature review (Malhotra & Baag, 2021) is that the assortative matching or the homogenous groups formed by people with similar risk types helps reduce adverse selection. It also seeks to analyze whether social ties, education, and information, and access to technologies help in improving group repayments. It also aims to address the role of leadership; social contract in mitigating loan default.

The hypothesis to be tested are mentioned below:

- (1) Information about the riskiness of the borrower reduces the risk of adverse selection among the group
- (2) This hypothesis deals with testing whether the repayment of the internal loans is impacted by the peer mechanism and the dynamic incentives
- (3) Misuse of funds in a group is impacted by the peer mechanism and dynamic incentives
- (4) This hypothesis deals with whether the peer mechanism and dynamic Incentives impact the repayment rate in external loans.

#### 3.2. Research Method

The data for the study was collected through a primary survey among 400 members of the SHGs. These self-help groups align with the NGO Spade in Kolkata, West Bengal, India. This NGO is the promoting agency for various Self-help groups under the Self-help group bank linkage program. The first hypothesis is tested using the ordered logit method and the other 3 hypotheses are tested using the logistic regression. The empirical strategy for the paper is given below:

$$\text{Ln}\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \quad (1)$$

In equation (1) the dependent variable is the odd ratio of adverse selection, internal delinquency, external delinquency, and misuse of funds

#### 3.3. Descriptive statistics

There are, in total, 400 female respondents from different SHGs. Based on age, 26.2% of the sample is 22-31 years, 39% are in the age group of 32-41 years, and 34% are in the age group of 42-51 years. 0.25% of the respondents are in the age group 52-61 years. Based on income, approximately 16.75% of the respondents earn between 1.25 lakhs to 1.35 Lakhs, 23.75% earn between 1.45 -1.55 Lakhs, 14.5% earn between 1.95-2.05 Lakhs, 2.25% earn between 2.25-3.35 Lakhs, 18.5% earn between 2.45-2.55 Lakhs and 24.25% earn between 2.65 to 2.75 Lakhs. There is no multicollinearity issue in the data as correlation among all the variable is less than 0.50. Table 1 provides the description of variables. For the selection of the clusters on the basis of income growth and credit risk was one using the cluster analysis, through the SPSS 25 software. ANOVA analysis established the significance of all the questions that have been used for identifying the clusters. The result of One-way ANOVA proves that the difference among the respondents on these questions is significant. The data analysis highlights a significant difference between the 3 clusters in terms of income growth and debt covenants, such as progressive lending, transaction costs, long-term maturity, and group interest rates as shown in Table 2. Thus, we generate clusters using the K – Means cluster approach using SPSS 26. There are a total of 211 low-risk borrowers, 88 high-risk borrowers and 101 moderate-risk borrowers. The description of the variables is given below in Table 1. Table 2 shows that all the questions included in the questionnaire are significant at 5% level of significance. Table 3 shows the significance of clusters formed through ANOVA. The data analysis highlights a significant difference between the 3 clusters in terms of income growth and debt covenants, such as progressive lending, transaction costs, long-term maturity, and group interest rates. The post hoc Scheffe test led to the same result that the difference between the clusters is significant.

Table 1. Description of variables

Variables	Description of variables
<b>Group Quality</b>	Variable on Likert scale (1) All risky (2) Risky (3) Moderate (4) Some safe (5) All safe
<b>Group pressure</b>	Binary variable (1= yes use of counselling; 0 = no use of counselling)
<b>Group sanction</b>	Binary variable (1=yes use of extreme measure; 0 = no use of extreme measure)
<b>Risk Category</b>	From cluster analysis (1= Moderate risk; 2= Moderate Risk; 3= High Risk)
<b>Education</b>	1=Members are 12 <sup>th</sup> pass; 0 = Members are not 12 <sup>th</sup> pass
<b>Financial literacy</b>	1= Financially literate members; 0= Lack of financial literacy
<b>Informal finance</b>	1= Taken informal finance; 0 = No informal finance
<b>Frequency of meetings</b>	1= more than 4 meetings in a month; 0 = less than 4 meetings in a month
<b>Dynamic Incentives</b>	Factor scores through Exploratory factor analysis
<b>Other loans</b>	1= loan taken from other sources; 0 = no loan from other sources

Table 2. ONE WAY ANOVA Significance of questions

	Mean SQ	MSE	F Stat	Sig
<b>How do members rate the growth of income after SHG Membership?</b>	1.718	0.404	4.248***	0.015
<b>Do you prefer progressive lending?</b>	32.648	0.868	37.59***	0.000
<b>Do members prefer lower transaction costs?</b>	10.20	0.574	17.76***	0.000
<b>Do members prefer lower interest rates?</b>	111.51	0.353	316.25***	0.000
<b>Do members prefer long-term maturity?</b>	176.67	0.586	301.57***	0.000

Table 3. ONE-WAY ANOVA Significance of clusters

		N	Mean	S.D.	S. E	LCL	UCL
<b>Income growth</b>	1	101	3.52	0.576	0.057	3.41	3.64
	2	211	3.69	0.687	0.047	3.60	3.79
	3	88	3.57	0.583	0.062	3.44	3.69
	Total	400	3.62	0.641	0.032	3.56	3.69
<b>Progressive lending</b>	1	101	1.51	0.559	0.056	1.40	1.63
	2	211	1.48	0.538	0.037	1.41	1.56
	3	88	3.48	0.742	0.079	3.32	3.63
	Total	400	1.93	1.014	0.051	1.83	2.03
<b>Transaction Cost</b>	1	101	1.56	0.842	0.084	1.40	1.73
	2	211	1.64	0.777	0.054	1.53	1.74
	3	88	1.73	0.754	0.080	1.57	1.89
	Total	400	1.64	0.789	0.039	1.56	1.72
<b>Long term loan</b>	1	101	1.97	0.921	0.092	1.79	2.15
	2	211	1.77	0.970	0.067	1.64	1.90
	3	88	2.03	0.928	0.099	1.84	2.23
	Total	400	1.88	0.954	0.048	1.78	1.97
<b>Internal loan</b>	1	101	3.67	0.814	0.081	3.51	3.83
	2	211	1.36	0.563	0.039	1.28	1.44
	3	88	2.13	1.004	0.107	1.91	2.34
	Total	400	2.11	1.212	0.061	1.99	2.23

### 3.4. Hypothesis testing

In the case of the joint liability group, if even one of the members does not pay, the entire group has to make the repayment. The very first stage in the formation of the group is peer selection, which involves screening the members of a group.

#### **Hypothesis 1: Information about the riskiness of the borrower reduces the risk of adverse selection among the group**

$$Y_i (\text{Group Quality}) = \alpha_0 + \beta_1 \text{ Moderate risk type of borrowers} + \beta_2 \text{ Low risk type of the borrowers} + \beta_3 \text{ Education} + \beta_4 \text{ Financial Literacy} + \beta_5 \text{ Access to technology} + \beta_6 \text{ Peer pressure} + \beta_7 \text{ Peer monitor} + \beta_8 \text{ Social ties} + \beta_9 \text{ Leadership} + \beta_{10} \text{ Information} + \beta_{11} \text{ Default by members} + \beta_{12} \text{ Use of informal finance} + \epsilon_i$$

Risk Type (1) is taken as the base category; in comparison to this category, the other two risk categories, i.e., risk category (2), which refers to the moderate risk, and risk category (3), which refers to the low-risk type are compared. This classification generated through the cluster analysis is used in the regression equation above as the proxy for borrower risk type. Binary or dichotomous variables are used for the risk category (2) & (3), And category (1) is the base category. Ordered logistic regression has been used to determine the relationship between group quality, borrower risk type, and other individual determinants of risk types.

Table 4. Impact of peer mechanism on group quality

Group Quality	Coefficient
Low risk	0.257(0.278)
Moderate risk	0.498***(0.254)
Education	0.531***(0.244)
Financial literacy	0.168(0.256)
Access to technology	0.563***(0.249)
Peer pressure	-0.365**(0.190)
Peer monitor	0.484***(0.177)
Social ties	-0.008(0.201)
Leadership	0.137(0.185)
Information	-0.489***(0.186)
Default of members	0.0938(0.202)
Informal finance	0.420***(0.202)
R square	0.095

The analysis of the empirical model above establishes that the high-risk member groups with similar risk types can form homogenous groups that increase group quality. The low-risk borrower group with the low-risk borrowers. Group quality is a variable that has 5 values, 1 is the perceived risk of the group is very high and 5 is the perceived risk of the group is extremely low or the group is safe.

Thus, the results show that risk type (3) or the groups that have low credit score on the basis of the cluster analysis have higher group quality score or are perceived as safe. This implies that groups that have high creditworthiness on the basis of income and loan preference are indeed perceived as safe by the members. Thus, there is no adverse selection in the group. This implies that homogenous risk matching helps to reduce the instances of adverse selection. Besides, that education is positively related to group quality. Further, access to technology helps improve group quality. Peer pressure reduces group quality, and peer monitoring helps to improve the quality of the group. Information about the borrowers leads to a decline in group quality. Furthermore, the R square for the model is approximately 9.5%.

**Hypothesis 2: This hypothesis deals with testing whether the repayment of the internal loans is impacted by the Peer Mechanism and the Dynamic Incentives**

The inability of the members of the group to pay back the number of loans taken from the internal funds of the bank is called internal delinquency in the group. In an internal loan, the group members have limited liability, and the group has joint liability. Suppose the output generated by all the members is greater than the liability of the defaulting member along with the penalty, the group jointly back the loans of the defaulting members. The research hypothesis for the internal default in the group is given below:

$$\begin{aligned} \text{Internal default (I.D.)} = & \alpha_i + \beta_1 \text{Group Pressure} + \beta_2 \text{Group Sanctions} + \beta_3 \text{Frequency of} \\ & \text{Meetings} + \beta_4 \text{Willingness} + \beta_5 \text{Leadership of members} + \beta_6 \text{Factor Scores for Dynamic Incentives} + \\ & \beta_7 \text{Education} + \beta_8 \text{Other loans} + \beta_9 \text{Financial literacy} + \beta_{10} \text{Access to technology} + \beta_{11} \text{Age} \\ & + \beta_{12} \text{Business Correlation} + \beta_{13} \text{Informal sources of finance} + \beta_{14} \text{Group Quality} + \beta_{15} \text{Moderate} \\ & \text{Risk} + \beta_{16} \text{Low risk} + \epsilon_i \end{aligned}$$

Table 5. Impact of peer mechanism on internal loan default

Yi = Internal default	Coefficient	Marginal effects
Group pressure	-0.0703(0.308)	-0.016(0.069)
Group sanction	0.133(0.309)	0.030(0.07)
Frequency of meetings	-0.039(0.165)	-0.008(0.037)
Willingness to help	-0.67*** (0.244)	-0.152*** (0.0553)
Leadership	-0.415** (0.226)	-0.094** (0.051)
Dynamic incentives	0.385*** (0.166)	0.087*** (0.0375)
Education	0.102(0.293)	0.023(0.06)
Other loans	0.351(0.256)	0.0796(0.058)
Financial literacy	-0.247(0.319)	-0.056(0.0723)
Access to technology	-0.694*** (0.295)	-0.057*** (0.286)
Business correlation	0.170(1.08)	-0.157*** (1.07)
Informal finance	0.333(0.266)	0.038(0.245)
Age	-0.000(0.014)	-0.0001(0.003)
Group Quality	0.020(0.109)	0.005(0.0247)
Moderate risk category	0.300(0.368)	0.068(0.083)
Low-risk category	0.145(0.391)	0.032(0.088)
Constant	0.943(0.751)	
R Square	0.162	

The above data analysis establishes that willingness to help others leads to a decline in internal repayment defaults. Better leadership leads to a reduction in the internal default in repayment of the loan. Access to technology leads to a decline in the default in repayment of internal loans

### **Hypothesis 3: Misuse of funds in a group is impacted by the Peer mechanism and dynamic incentives**

This hypothesis aims to test the impact of the peer mechanism, which comprises peer selection, peer monitoring, and peer sanction on the misuse of funds and finances within an organization. It aims to analyze the impact of peer mechanisms on the misappropriation of funds. In a group, the members jointly take a loan from the banks on the basis of social capital. This implies that if one member fails to pay then other members collectively pay the loan of the defaulting member. Knowing that the other members will pay the loan in case of individual default, the members might misuse the funds for nonproductive purposes. This is called as moral hazard and misuse of funds. Logistic regression has been used to calculate the likelihood of misuse of funds. The empirical strategy followed in this model to calculate the probability of default is given below:



$$\text{Misuse of funds } (Y_i) = \alpha_i + \beta_0 \text{ Group Pressure} + \beta_1 \text{ Group Sanctions} + \beta_2 \text{ Frequency of Meetings} + \beta_3 \text{ Willingness} + \beta_4 \text{ Leadership} + \beta_5 \text{ Dynamic Incentives} + \beta_6 \text{ Education} + \beta_7 \text{ Loan from other channel} + \beta_8 \text{ Financially literacy} + \beta_9 \text{ Income} + \beta_{10} \text{ Informal sources of finance} + \beta_{12} \text{ Internal default} + \beta_{13} \text{ External default} + \beta_{14} \text{ Moderate Risk} + \beta_{14} \text{ Low Risk} + \epsilon_i$$

The members in a joint liability suffer from the issue of moral hazard or misuse of funds after the grant of a loan. Peer monitoring has emerged as an essential concept to mitigate moral hazard. The individual members have limited liability in a group, whereas the group has a joint liability. In a joint liability group, the members know each other and monitor each other and exert pressure to ensure the resolution of the problem of moral hazard, (Hermes, Lensink & Mehrtab, 2005).

Table 6. Impact of peer mechanism on Misuse of Funds

Yi Misuse of funds	Coefficient	Marginal effect
Income	0.285(0.192)	0.067(0.045)
Education	-0.311(0.259)	-0.073(0.061)
Loans from another channel	-0.121(0.244)	-0.028(0.058)
Group pressure	-0.095(0.306)	-0.022(0.072)
Group sanction	0.534***(0.312)	0.126***(0.074)
Frequency of meetings	-0.081(0.173)	-0.019(0.041)
Willingness to help	-0.243(0.238)	-0.057(0.056)
Leadership	-0.0784(0.216)	-0.018(0.051)
Dynamic incentives	-0.569***(0.164)	-0.135***(0.038)
Informal finance	-0.164(0.252)	-0.389(0.059)
Financial literacy	-0.129(0.405)	-0.03(0.096)
Moderate risk	-1.24***(0.348)	-0.295***(0.0824)
Low risk	-1.06(0.382)	-0.253(0.090)
Internal loan default	0.448***(0.242)	0.106(0.057)
External loan default	-0.789***(0.249)	-0.187(0.0591)
Constant	0.185(0.591)	
R Square	0.153	

From the data analysis, it becomes apparent that fund misuse increases with the imposition of group sanctions. Group sanctions on the leader of the group lead to a decline in the motivation of the group and lead to dissonance. In a group, one leader per group was interviewed. A leader is a person of eminence and influence in the group. He is a in central position in the group. Thus, sanctions have a negative impact on the morale of the group leading to the misuse use of the funds, leading to moral hazard. Dynamic incentives such as progressive lending led to a decline in the misuse of funds. The lower risk type reduces the probability of misuse of finances. Internal loan default increases the chances of misuse of funds, and default in repayment of external loans leads to the decline in misuse of funds. In case of internal loan default, generally, sanctions and pressure are not used. This is

because the members take internal loans from the rotated savings. Thus, if a member is defaulting on payment of the internal loan, it might be because he has used the funds for consumption and nonproductive purposes. But in case of the external loans, the members have jointly taken the loan from the banks. Due to the joint liability in the external loans, the peer monitoring and peer sanctions are high. This is the reason that external loan default reduces the chances of misuse of funds. This could be because an external loan refers to a bank loan, and the respondents who have taken bank loans also have the dynamic incentive of progressive loans, and the analysis shows that the dynamic incentive negatively impacts the propensity to misuse funds. This could also be due to the threat of peer sanctions.

**Hypothesis 4: This hypothesis deals with whether the Peer mechanism and Dynamic Incentives impact the repayment rate in external loans.**

External loans refer to loans taken from the banks and formal financial institutions like Microfinance institutions. Within the purview of the Self-help group bank linkage program, the group members take a loan from the bank as a group. After that, this loan is distributed among the members individually. Often, the members of the group are not able to pay the external loan, which is referred to as the external delinquency of loans. The logistic regression estimation model shows the estimation of the various peer pressure mechanism such as peer selection, peer monitoring, and peer sanction on the overall group repayment behavior. The empirical model estimates the impact of peer monitoring, peer pressure, and peer sanction on the financial performance of the borrowers. A practical strategy to address the role of the peer mechanism in resolving external loan defaults is given below:

$$\text{External funds (I.D.)} = \alpha_i + \beta_1 \text{ Group Pressure} + \beta_2 \text{ Group Sanctions} + \beta_3 \text{ Frequency of Meetings} + \beta_4 \text{ Willingness} + \beta_5 \text{ Leadership} + \beta_6 \text{ Dynamic Incentives} + \beta_7 \text{ Education} + \beta_8 \text{ Loan from other channel} + \beta_9 \text{ Financially literate} + \beta_{10} \text{ Access to technology} + \beta_{11} \text{ Age} + \beta_{12} \text{ Business Correlation} + \beta_{13} \text{ Informal sources of finance} + \beta_{14} \text{ Group Quality} + \text{Moderate Risk} + \text{Low Risk} + \epsilon_i$$

Table 7. Impact of peer mechanism on external loan default

<b>Yi = External loan default</b>	<b>Coefficient</b>	<b>Marginal effects</b>
<b>Group pressure</b>	-0.442(0.309)	-1.07(0.074)
<b>Group sanction</b>	0.636***(0.313)	0.154***(0.076)
<b>Frequency of meetings</b>	-0.051(0.181)	-0.012(0.044)
<b>Willingness to help</b>	0.131(0.241)	0.031(0.058)
<b>Leadership</b>	0.240(0.223)	0.058(0.054)
<b>Dynamic incentives</b>	0.181(0.160)	0.044(0.038)
<b>Education</b>	-0.848***(0.286)	-0.205***(0.069)
<b>Other loan</b>	0.250(0.253)	0.060(0.061)
<b>Financial literacy</b>	-0.916***(0.314)	-0.222***(0.076)
<b>Access to technology</b>	0.020 (0.296)	0.005(0.071)
<b>Business correlation</b>	0.316(0.123)	0.0766(0.298)
<b>Informal finance</b>	0.390(0.260)	0.094(0.063)
<b>Age</b>	-0.007(0.014)	-0.001(0.005)
<b>Group quality</b>	0.066(0.109)	0.016(0.026)
<b>Moderate risk</b>	-1.039***(0.367)	-0.251***(0.088)
<b>Low risk</b>	-0.990***(0.403)	-0.239***(0.097)
<b>Constant</b>	1.224(0.745)	
<b>R Square</b>	0.190	

The data analysis establishes that there is a significant and negative relationship between financial literacy, education, and external loan default. Regarding the risk type of the members, as compared to the high-risk borrowers, the borrowers of the low-risk kind are inclined to choose the borrowers with a similar nature of risk propensity. Thus, borrowers with the lower-risk type than the high-risk type are less prone to external loan default in repayment of the loan.

#### 4. Conclusion

This research study establishes that the misuse of funds, internal delinquency, and external delinquency depend on the borrowers' risk propensity. It also shows that peer mechanisms such as peer monitoring reduce the chances of misuse of funds and internal delinquency, and external loan delinquency. Though, the peer sanction might lead to demotivation and dissonance, increasing the misuse of funds. The general theory of peer mechanism propagates that peer mechanism in the form of peer sanction, peer monitoring, and peer selection reduced misuse of funds and internal and external delinquency. Analysis reveals that peer sanction leads to more misuse of funds, internal and external loan delinquency. In a group, the members can match with a similar risk type, leading to homogenous groups, which helps reduce the problem of adverse selection. Further, the analysis of data reveals that peer monitoring helps to improve the rate of repayment and reduces internal delinquency and external delinquency. Access to technology, business correlation, and willingness to help others reduce the risk of loans delinquency. Dynamic incentives in progressive loans reduce the

risk of internal failure as members in a joint liability group get motivated by the additional bank loans and regularly pay their loans. One significant finding is that the lower-risk type has a lower propensity to default and misuse funds. Peer monitoring reduces the risk of default, but peer sanctions work adversely and, in fact, negatively reinforce the members to default. This could also culminate in strategic default. Within the framework of positive reinforcement, the positive forces such as peer monitoring and peer selection reduce adverse selection and moral hazard, whereas peer sanction leads to higher defaults and frauds.

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