

SGSY : HOW MUCH BENEFICIAL ACROSS SOCIO-RELIGIOUS COMMUNITIES?

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ABSTRACT

The paper analysed the impact of 'Swarnajayanti Gram Swarajgar Yojana (SGSY)', a government sponsored micro-finance programme, on 'food expenditure', 'expenditure on temptation good', 'expenditure on children's education and health', 'business expenditure' and 'profit' across different castes, creeds and religious beliefs. Murshidabad district of West Bengal, India, was chosen as the field of investigation. During the survey stratification was done in terms of social hierarchy and religious beliefs. These are Upper Caste Hindus (UC); Other Backward Castes (OBC); Scheduled Castes (SC) and Muslims. Taking together they are called socio-religious communities (SRCs). To remove selection bias we used 'treatment effect model'. The paper reveals that participation in SGSY programme decreased 'food expenditure' across all SRCs significantly except Muslims. Borrowing from the SGSY programme has significant negative impact on 'expenditure on temptation good' for the households of UC and OBC communities. The influence is negative but insignificant for Muslim-programme participating households. However, participation in the SGSY programme increased expenditure on temptation good for SCs, though insignificantly. Borrowing from SGSY-run self-help group (SHG) enhanced spending on children's education and health across all SRCs, but significantly for UC and OBC. 'Business expenditure' and 'profit' increased significantly due to programme participation across all SRCs except Muslims. Programme participant Muslim-households get minimal benefits of this development programme among SRCs.

Introduction

The impact of any development programme differs widely among different castes, creeds and religions of a society. India is a multi-religious, multi-lingual and multi-cultural country. Variations in terms of human development, poverty and deprivation among socio-religious communities (SRCs) are wide,

and evaluation of impact might yield a better picture if the process incorporates heterogeneity existing among social communities. This paper explores the impact of participation in government-sponsored micro-finance programme — the Swarnajayanti Gram Swarajgar Yojana (SGSY) - on 'expenditure on food', 'expenditure on temptation good', 'expenditure on education

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and health of children', 'expenditure on business' and 'profit' across communities of different faith and socio-economic status in West Bengal, India.

The existing economic research on micro-finance can be divided into two broad areas: (i) the theoretical analysis of the distinctive features of 'credit contracts' (like joint liability and dynamic incentives) with an emphasis on their implication for solving the adverse selection and moral hazard problems (See, for example, Stiglitz, 1990, Besley and Coate, 1995, Ghatak, 2000, Jain and Mansuri, 2003, Aghion and Morduch, 2000, Laffont and Rey, 2003, and Rai and Sjostron, 2004), and (ii) the empirical analysis that focuses on the evolution of the effects of such programmes on the welfare of the borrowers, especially the women (See, for example, Pitt and Khandker, 1998, Morduch, 1998, Smith, 2002). However, there is no consensus among academicians on the impact of micro-credit. It is well recognised that the estimate of a causal effect obtained by comparing a treatment group with a non-experimental comparison group could be biased because of problems such as self-selection or some systematic judgment by the researcher in selecting units to be assigned to the treatment. It warrants for application of an appropriate technique like 'Treatment Effect'.

SGSY and Background Literature

SGSY scheme is an amalgamated version of six self-employment schemes. This scheme is based on 'joint liability'¹, 'progressive lending'² and 'back-ended subsidy'³ principles. Initially each member has to contribute some amount to her group corpus regularly. At least after six months of the formation of the group, each SHG has to appear in graduation test. The performance of a group depends on the average number of meetings arranged by the group in a particular month, regularity of the monthly contribution, regularity of the

repayment of loans etc. Consequently the group has to go through the II - graduation test, and ultimately become eligible to get subsidy. As groups pass different graduation tests, they become eligible to get higher amount of credit.

Though the programme is in vogue for more than one decade, there are meagre studies to provide a comprehensive picture as well as the impact generated by the programme. 'The Comptroller and Auditor General' (CAG Report on SGSY, 2003) observed that all over the country the programme could not be implemented in the desired manner. It was felt that the implementing agencies did not prepare the 'swarojgaris'⁴ for taking up self-employment activities. In fact although the programme was conceived as process-oriented one, the activities, such as proper identification of 'swarojgaris', selection of key activities, market survey, networking the 'swarojgaris' were not carried out properly in many districts. The Report even went to the extent of saying that SGSY has not emerged as an improvement over the earlier Integrated Rural Development Programme (IRDP).

Another important study was taken up by the Centre for Management Development, Thiruvananthapuram in 2004 on impact assessment of the programme and found marginal improvement in income. The average annual incremental income earned by the individuals due to the assistance under the programme was ₹ 8800 whereas in case of group 'swarojgaris' it was substantial, ₹ 34,920. The study also found that in 89 per cent district line department participated actively. It was also observed that nearly 72 per cent of the respondents did not undergo any training for skill development. The average cost of various individual projects taken up under the programme in different States varied from ₹ 16,000 to 40,000. Nearly half of the respondents did not obtain second or multiple

doses of credit. This apart, the Ministry of Rural Development, Government of India also commissioned district-wise studies across the country to know the impact of rural development programmes, including SGSY.

National Institute of Rural Development, Hyderabad conducted a national level study on SGSY during 2006. The average post-project income of the SGSY group 'swarojgaris' was ₹ 1356, at least 46 per cent less than the level of income desired in the project objectives. Kundu (2008) observed in 'Bankura' district that SGSY helped the rural poor to reduce their poverty but failed to reduce their vulnerability. Thekkekara (2008) found in Amaravati district, Maharashtra that the 'swarojgaris' formed SHGs solely with the objective of availing of subsidy of the programme. She further found that the assumption on investment levels necessary for poverty alleviation under SGSY was unrealistic.

Lyngdoh and Pati (2011) conducted a study in 'Meghalaya'. The study revealed that micro-finance has resulted in a positive socio-economic change for the borrowers. It has led to an appreciation of income, expenditure, savings, increased access to productive assets and household property etc. Kalpana (2011) in her study in 'Tamil Nadu' found that out of 97 sample respondents, 33 directly invested some part of their SHG loans to finance a total of 37 income-generation activities. Only 17 of the 37 activities (46 per cent) were initiated by respondents after joining SHGs, with the remaining having existed prior to joining SHGs. SHG-member households, which did not own capital assets (that could serve as a financial cushion in case of a business downturn) nor had prior entrepreneurial experience, were unwilling to make investments in new business activity.

Sawtelle, (1993) estimated two linear Engel functions for household total expenditure using US cross section data. Using data from the United States, Lee and Brown,

(1986) examined food expenditure of household. However, studies on consumption in the context of developing countries are not overwhelming. In this regard it is worth mentioning the study conducted by Weiskoff (1971), who studied demand elasticity for the developing economy. Ray and Meenakshi (2002), combined the expenditure and demographic information contained in the unit records of nearly 70,000 households to analyse rural poverty in India. Research suggests that access to credit has the potential to reduce poverty significantly (Khandker, 1998, Wahid, 1993; Khandker, 2003). Based on the success stories (Hossain, 1988; Hulme et al. 1996; Yaron, 1992; Montgomery et al. 1996) it is assumed that micro-credit is improving the standard of living and well-being of the borrowers by improving their level of consumption. Rahaman et al. (2012) investigated the consumption behaviour of the borrowers from two major micro-credit institutions in Bangladesh and compared that with the non-borrowers of the same category. The study suggests that borrowers of micro-credit programmes are better-off in terms of consumption of most of the food and non-food items compared to non-borrowers.

Micro-finance interventions have been shown to have a positive impact on the education of clients' children. Littlefield, Morduch and Hashemi (2003) state that one of the first things that poor people do with new income from micro-enterprise activities are to invest in their children's education. Studies show that children of micro-finance clients are more likely to go to school and stay longer in school than that of the non-clients. Similar findings were seen for projects in Zimbabwe, India, Honduras and Bangladesh.

The literature on enterprise dynamics (entry, growth, exit) in developing countries shows that firm characteristics such as age, size, location and sector in which the enterprise operates are important. In addition, personal

characteristics of the owner matter, such as education, age and gender. Less is known, however, about the determinants of enterprises' success in terms of profits. In an early study, Vijverberg (1991) found no significant determinants of profits among self-employed persons in the food commerce sector in Cote d'Ivoire. More recent research by Masakure et al. (2008), on non-farm micro-enterprises in Ghana, confirmed the results found in the literature on enterprise dynamics. The study showed that size, sector and the number of months the firm was in operation during the past year determined MSEs' financial performance. Some of these studies also suggested a role of risk in determining firm profitability (Fajnzylber et al., 2006). The psychology literature describes the importance of risk attitude of the entrepreneur and how this relates to firm performance (e.g. Rauch & Frese, 2000; Kraus et al., 2005).

Methodology

Field Selection : The district of Murshidabad, West Bengal was chosen as the field of study. The district is one of the most

backward districts in the country in terms of human development index (Sachar, 2006). As per Census-2001, the district is most densely Muslim populated district in the country. Therefore, it is interesting to observe how programme participants of a backward district get benefited from the programme. 'Sachar Committee Report (2006)' portrayed heart-rending socio-economic conditions for the Muslims. Therefore, the district becomes a pertinent field to measure the impact of the programme across socio-religious communities. At the first stage of sampling of SHGs under SGSY scheme, however, an intervening stratification by categories of communities was introduced. SHGs were classified among four strata by caste and community affiliation : Upper Caste Hindus (UCs), Scheduled Caste Hindus (SCs), Other Backward Castes (OBCs) and Muslims. A survey was conducted in both programme-villages⁵ and non-programme-villages⁶. These data are a part of two-year panel data. A survey was conducted both in 2006 and 2008. Overview of sampling across socio-religious communities (SRCs) in 2008 is given in Table 1.

Table 1 : Overview of Sample Size Across Socio-Religious Communities

District : Murshidabad Socio-Religious Communities	No. of SHG member- households under SGSY groups covered in programme villages	Non-SHG member- households covered in programme villages	Non-SHG member- households covered in non-programme villages
UC	109	50	30
OBC	58	27	10
SC	55	28	10
Muslim	55	27	10
Total	277	132	60

Method of Impact Analysis: Simply using non-participating households as a control group will not be a solution to address selection biases. In order to identify such a control group, the best strategy is to find out exogenous eligibility conditions used by the lenders in selecting a borrower (Nagyuen, 2007). These exogenous requirements will help to define who among non-participating households are compared with participants. Pitt and Khandker (1998), Morduch (1998) and Khandker (2003) used the ‘Grameen Bank’s’ eligibility requirement of maximum landholding of 0.5 acre to define control group. However, we do not find that sort of exogenous eligibility in our data.

The basic problem of impact analysis is to find the missing counterfactual. ‘Counterfactual framework’ is proposed by Rubin (1973) and subsequently used by both statisticians and econometricians (Rosenbaum and Rubin (1983), Heckman, Imbens and Angrist (1994), Heckman, Ichimura and Todd (1997), Jalan and Ravallion (2003) among others) to estimate the average treatment effects. Let Y_1 denotes the outcome with treatment and Y_0 denotes outcome without treatment.

Recognise that a unit cannot simultaneously be in both states. So, we cannot observe both Y_1 and Y_0 at the same time for the same unit. This is known as “missing data” problem. Let t be a binary indicator, where $t=1$ indicates participation in the programme and $t=0$ otherwise. (Y_1, Y_0, t) represents a random vector from the population of interest. For a random draw i from the population, the relevant vector is (Y_{1i}, Y_{0i}, t_i) . The implicit assumption that we make is that treatment of the unit i affects only the outcome of the unit i and does not affect any other unit’s outcome. Moreover, (Y_1, Y_0) could be correlated with t .

To measure the impact of the programme, we are interested in the

difference in outcomes with and without treatment. Several estimators are possible. We use the standard estimator of the average treatment on the treated (ATE) defined as :

$$ATE = E(Y_1 - Y_0 | t=1) \dots \dots \dots (1)$$

i.e. the mean effect of the programme on the participants. Furthermore, if X is a vector of observed covariates, ATE can be redefined as :

$$ATE = E(Y_1 - Y_0 | t=1, X) \dots \dots \dots (2)$$

Right at the beginning of the discussion we had posed the econometric problem underlying the estimation of programme impacts as that of “missing data”. That is, for each treated (non-treated), at any point in time, we observe only Y_1 (Y_0). The observed outcome is:

$$Y = Y_0 + t(Y_1 - Y_0) \dots \dots \dots (3)$$

The question, therefore, remains as to what do we do about the ‘missing data’ problem?

Imagine we have access to data on a large number of treated and non-treated in one region.

One approach is to take the average of both groups and examine the difference between average t scores on outcomes. In a large sample, this will converge to

$$D = E(Y_1 | t=1) - E(Y_0 | t=0) \dots \dots \dots (4)$$

Subtracting and adding $E(Y_0 | t=1)$. i.e., the expected outcome for a subject in the treatment group had she not been treated (a quantity that cannot be observed but is logically well defined)

We obtain,

$$D = E(Y_1 | t=1) - E(Y_0 | t=1) + E(Y_0 | t=1) - E(Y_0 | t=0) \dots \dots \dots (5)$$

$$= E(Y_1 - Y_0 | t=1, X) + E(Y_0 | t=1) - E(Y_0 | t=0) \dots\dots\dots (6)$$

The first term, $E(Y_1 - Y_0 | t=1, X)$ is the treatment effect that we are trying to isolate (i.e., the effect of treatment on the treated) whereas $E(Y_0 | t=1) - E(Y_0 | t=0)$ is selection bias. In reality it is impossible to observe the counterfactual $E(Y_0 | t=1)$. Therefore, ATE can be identified only when $E(Y_0 | t=1) = E(Y_0 | t=0)$. This is possible in case of randomisation. In non-experimental studies one has to invoke some identifying assumptions to solve the selection problem. One possible identification strategy is to assume, that given a set of observable covariates X which are not affected by treatment, potential outcomes are independent of treatment assignment: $Y_0, Y_1 \perp t | X$ for all X . This condition is known as 'Conditional Independence Assumption'. Then no need to worry about unobservable heterogeneity. The situation is as if people were selected in the programme only on the basis of observable characteristics. If there is a selection on observable, then the counterfactual outcome for participant i is equal to the outcome of non-participant j with the same observable attributes. Matching provides a way of controlling for observable heterogeneity by finding in the comparison group look-alikes for participants, based on some tolerance criterion. This is an attempt to replicate the 'all other things being equal or held constant' solution subject to conditional independence.

In practice matching directly on observable characteristics becomes more and more difficult, the larger the set of attributes. The dimensionality of the problem can be significantly reduced by matching on the propensity score i.e. the probability of participation, $p(X)$ (Rosenbaum and Rubin, 1983). Thus, instead of conditioning on n -dimensional variable; units are matched with

the basis of a scalar variable. 'Propensity score' analysis requires a large set of data. As we want to make a comparative analysis across the SRCs, and size of the data is not sufficiently large, we are not in a position to apply 'propensity score analysis.' 'Treatment Effect' model in this regard might be an efficient way to measure the impact of SGSY programme across SRCs. In treatment effect model a dummy variable D_i indicates the treatment condition where $D_i = 1$ for the programme participants and $D_i = 0$ otherwise. This D_i directly enters into the regression equation. Outcome variable D_i of the regression equation is observed for both the programme participants as well as non-programme participants. Here 'Treatment Effect' model differs from Heckman's 'Sample Selection Model'. In Heckman's model outcome variable Y_i of the regression equation is observed for the treated i.e. the programme participants only. The 'Treatment Effect' model is expressed in terms of following two equations:

Regression equation

$$Y_i = X_i \beta + D_i \delta + \epsilon_i \dots\dots\dots (7)$$

Selection equation :

$$D_i^* = Z_i \lambda + \mu_i, D_i = 1 \text{ if } D_i^* > 0 \text{ and } D_i = 0 \text{ otherwise } \dots\dots (8)$$

$$\text{Prob}(D_i = 1 | Z_i) = \Phi(Z_i \gamma)$$

and $\text{Prob}(D_i = 0 | Z_i) = 1 - \Phi(Z_i \gamma)$, where ϵ and μ are bivariate normal with mean zero and covariate matrix

$$\begin{bmatrix} \delta & \rho \\ \rho & 1 \end{bmatrix}$$

Given incidental truncation or sample selection and that D is an endogenous dummy variable, the evaluation task is to use the

observed variables to estimate the regression coefficients β , while controlling for selection bias induced by non-ignorable treatment assignment (Guo and Fraser, 2010). Model consisting equation (7) and (8) is a switching regression model where for the treated or programme participants the outcome model is:

$$Y_i = X_i \beta + (Z_i \gamma + \mu_i) \delta + \varepsilon_i, \text{ and for the non-treated the outcome model is } Y_i = X_i \beta + \varepsilon_i.$$

This model can be estimated in a two-step procedure. The log likelihood function following Madala (1983) for participant i are as follows : for $D_i = 1$,

$$= \ln \phi \left\{ \frac{-Z_i \gamma + (Y_i - X_i \beta - \delta) \rho / \sigma}{\sqrt{1 - \rho^2}} \right\} - \frac{1}{2} \left(\frac{Y_i - X_i - \delta}{\sigma} \right)^2 - \ln(\sqrt{2\pi\sigma}) \dots\dots(9)$$

For $D_i = 0$ (10)

$$= \ln \phi \left\{ \frac{-Z_i \gamma (Y_i - X_i \beta) \rho / \sigma}{\sqrt{1 - \rho^2}} \right\} - \frac{1}{2} \left(\frac{Y_i - X_i - \delta}{\sigma} \right)^2 - \ln(\sqrt{2\pi\sigma}) \dots\dots(10)$$

Factors Determining SGSY Participation : The participation in SGSY programme is determined, as specified in equation (8), by a host of factors at the household and group level, including physical endowments (such as land) and human capital (such as education), given the availability of the programme in a village. Equation (8) has to be estimated jointly with equation (7). D_i is a binary variable and Z_i consists of following variables: 'number of years living in the same locality', 'index of women's access to public offices and processes of political activities', 'index of household's social capital', 'education level', 'education level', 'wealth of the household', 'wealth of the household', 'gender of the household head', and 'occupation of the household head'.

Our a priori expectation is that likelihood of participating in the SGSY programme is positively related with 'number of years of living in the same locality', 'index of women's access to public offices and processes of political activities', 'index of household's social capital', 'education level', and 'wealth of the

household'. Each of the variables can positively influence the likelihood of participation in the SGSY programme. The square value of education and wealth has been taken to see whether there exists any non-linear relationship between these variables and likelihood of participation. It is expected that women-headed households have a high probability of participating in the SGSY programme. Gender of the household is a binary variable, and male gender of the household is the reference category. We further postulate that if the occupation of the household head is non-agriculture like petty trading, then there is greater likelihood to participate in the SGSY programme. 'Occupation of the household head' is also a binary variable, and occupation-agriculture is the reference category.

IMPACT ANALYSIS, RESULTS AND DISCUSSION

Impact of SGSY on Food Expenditure

Here we calculate expenditure of household on food items. The food items are;

(a) cereals and cereal substitutes; (b) pulses and their products (including gram); (c) milk and milk products; (d) edible oil; (e) egg, fish and meat; (f) vegetables and fruits and (g) sugar, salt, spices and processed food. The value of consumption of food for a period of 30 days is obtained for a surveyed household.

In equation (7) Y is the outcome variable 'monthly per capita expenditure on food' and X is the vector of following explanatory variables:

i. Household Size : If household size is large, then there may be lower consumption expenditure. Following the conversion to adult equivalents used by Townsend (1994) for rural Andhra Pradesh and Maharashtra, the weights are: for adult males, 1.0; for adult females, 0.9. For males and females aged 13-18, 0.94, and 0.83, respectively; for children aged 7-12, 0.67 regardless of gender; for children 4-6, 0.52; for toddlers 1-3, 0.32; and for infants 0.05.

ii. Gender of the Household Head : This variable is binary in nature. It takes value 1 if the household head is female, and zero otherwise. Most of the women-headed households are resource-poor in nature. So a woman-headed household will spend less compared to the reference category.

iii. Age of the Household Head : As per the report of 'Euro Stat' (2008) the mean consumption expenditure of a household whose head is aged between 30 to 59 years old tends to be much higher than the equivalent expenditure of household whose head is either aged under 30 or over 60. We take age as an explanatory variable.

iv. Occupation of the Household Head : We assume that if the occupation of the household head is non-agriculture, then the expenditure will be lower. This variable is a dummy variable.

v. Number of Working Adults in the Households : As may be expected, there is a strong link between household income and expenditure. There is supposed to be a strong correlation between average household consumption expenditure, the size of households and the number of active persons in the household. Household consumption expenditure was higher in households with three or more adults with dependent children and lowest within single person households; households with three or more active people spent more than households with no active people. Nevertheless, in both cases the relationship was not linear: economies of scale (for example, sharing a flat or a car, heating a room, etc.) may, at least to some degree, explain why the expenditure of a single person is generally considerably more than half the expenditure of a couple.

vi. Social Security Measures : Whether household members have the opportunity of protectional or promotional social security measures. Availability of social security measures increases household expenditure. We consider here whether household members get the benefits of 'National Rural Employment Guarantee Programme (NREGP)', 'National Old Age Pension Schemes (NOAPs)', 'National Family Benefit Schemes (NBFS)', 'Scheme for Handloom Weavers and Artisans', 'Janshree Bima Yojana' and 'Krishi Shramik Samajik Suraksh Yojana'. All these schemes have been introduced by the Government of India.

We estimate both equations (7) and (8) for each of the four socio-religious communities UC, OBC, SC and Muslims using 'Treatment Effect Model'. In each case non-programme participant households become the reference category. Regression results are as follows :

From the above Table we can observe that 'lambda' is significant for all the SRCs, i.e.,

Table 2 : Impact of Borrowing from SGSY on 'Expenditure on Food' Across SRCs

SRCs Variables	UC	OBC	SC	Muslims
Constant	14.63**(6.13)	18.461* (3.28)	23.45* (5.017)	20.703*(2.185)
Household Size	3.51** (1.405)	2.85 (1.9)	1.557 (1.47)	2.58** (.124)
Gender of Household Head (Ref: Male)	-.313 (1.32)	-.11 (.28)	-.903*** (.524)	.077 (.187)
Age of the HH	.198 (.438)	.256 (.291)	.236 (.253)	.138 (.163)
Occupation of the HH (Ref: Agriculture)	2.62 (1.59)	.699*** (.403)	1.27* (.434)	.169 (.248)
No. of Working Adults	5.54* (1.75)	1.4* (.43)	5.837* (1.7)	.82 (.715)
Social Security Measures (Ref: No social security)	2.175**(1.064)	.075 (.247)	1.232** (.532)	.042 (.29)
Participation in SGSY Programme (Ref: Non-participation)	-7.37** (3.21)	-1.835*** (.995)	-1.496* (.412)	-1.358 (2.29)
Participation in SGSY Programme				
Constant	-.64 (3.13)	4.139 (4.53)	2.35 (1.75)	-6.60 (5.42)
No. of Years Living in the Same Locality	.054 (.124)	.153 (.156)	.053 (.11)	.045 (.185)
Index of Women's Access to Public Office	.327 (.22)	.08 (.281)	.2053 (.134)	.376 (.284)
Household's Social Capital	.027 (.116)	.0226 (.179)	.0789 (.073)	.060 (.114)
Education Level	.112*** (.057)	.126*** (.067)	.0111 (.012)	-.030 (.03)
Education Level ²	-.076*** (.043)	-.053 (.047)	-.0158 (.024)	.012 (.044)
Wealth	.063 (.06)	.068 (.094)	.0013 (.041)	.097 (.106)
Wealth ²	-.027 (.046)	.188 (.196)	-.0129 (.037)	.269 (.261)
Gender of Household Head	.73** (.37)	.367 (.439)	.561*** (.241)	.213 (.501)
Wald Chi ²	33.1	68.79	151.18	49.70
Prob> Chi ²	.0003	0.000	0.000	0.000
Λ (Lambda)	-4.921**(2.063)	1.14***(.59)	-.535** (.209)	-.954* (.244)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

correlation between error terms of equations (7) and (8) are non-zero. It creates selection bias in estimation. Therefore, 'treatment effect' model is appropriate in this context. All Wald statistics are significant. It implies that all covariates used in the regression model may be appropriate, and at least one of the covariates has an effect that is not equal to zero. From the lower panel of the above Table we can see that 'household size', 'number of working adults' and 'social security measures' have significant positive impact on the decision of SGSY programme participation. Households having more members, more working adults and social security measures are more likely to join the SGSY programme. These variables create 'selection biases' in the estimation of food expenditure for UCs. Treatment effect is an indicator of programme impact net of observed selection bias. This statistic is shown by the coefficients of the variable 'participation in the SGSY programme' in the upper panel of the Table.

From the above Table it is evident that 'expenditure on food' has been decreased 7.37, 1.835, 1.496 and 1.358 times for UC, OBC, SC and Muslim programme-participating households compared to non-programme participating households. This result does not corroborate the available evidence that participation in micro-finance programme enhances food expenditure. This decline in food expenditure could be to meet increased business expenditure.

Impact of SGSY on 'Temptation Good'

Experimental studies have defined addiction in terms of reinforcement, acquired tolerance and withdrawal. Reinforcement implies a learned response to past consumption; that is, greater past consumption raises the marginal utility of current consumption. Acquired tolerance: a given level of current consumption is less satisfying when past consumption is higher. Withdrawal: a

negative physical reaction and other reductions in satisfaction as current consumptions are terminated.

'Temptation good' comprises the following items : (a) betel leaves including supari, lime and katha; (b) tobacco and its product; (c) liquor; (iv) intoxicants like 'mahua' and 'ganza'; (d) meals or snacks consumed outside the home; and (e) lottery tickets and gambling. In surveyed household respondents were asked expenditure on these items for the last thirty days. We want to estimate the impact of SGSY participation on the monthly per capita expenditure on 'temptation good'. In equation (7) X contains following explanatory variables:

i. Mean Education of the Household : A better-educated household will realise the danger of negative relationship between education and 'expenditure on temptation good'.

ii. Gender of the Household Head : There are several findings that if money is channeled through women, then there is less likelihood of spending money in 'temptation good'. Therefore, we expect a positive relationship between these variables.

iii. The Highest Level of Female Education in the Household : We measure female education in terms of years of formal education. A better-educated woman should have greater say in the financial matters, and acquaint with the hazard of 'temptation good'.

iv. Occupation of the Household Head : We assume that if the occupation of the household head is non-agriculture, then expenditure on 'temptation good' will be lower. This is a binary variable and reference category is agriculture.

v. Working Adults : Large number of working adults in the household mean the household is economically better-off.

However, we do not assume any positive or negative relationship between working adults and expenditure on 'temptation good'.

vi. Participation in SGSY Programme: Participation in SGSY programme or micro-finance programme releases a series of positive effects. It has the potential to empower women, and make aware people about the evils of addiction or gambling. Therefore, we anticipate a negative relationship between participation in micro-finance programme and expenditure on temptation good.

We estimate equation (7) and (8) jointly for each of the four SRCs i.e. UCs, OBCs, SCs and Muslims. In all these cases non-programme participant households are reference categories.

Regression result shows that borrowing from SGSY programme has significantly reduced spending on temptation good for UCs and OBCs, but enhanced spending on temptation good for SCs. Education has a strong negative influence on the expenditure on temptation good. We do not get any significant impact of the gender of the household head on this expenditure. 'Number of working adults', a proxy of household financial status has some positive impact on spending on temptation good, though insignificant. Female education is one of the variables that curtail spending on temptation good.

Values of 'Wald-chi-square' are significant across all the SRCs. It implies, covariates used in the regression models are appropriate. Statistically significant values of lambda justify use of 'treatment effect model' for estimation.

Impact of SGSY on the Expenditure on Education and Health of Children

'Expenditure on education and health of children' consists of following items (a)

expenditure on books, paper, pen and pencil; (b) fees to educational institute; (c) fees to private tutor; (d) expenditure incurred on account of journey to educational institute; (e) expenditure on medicine; (f) payments to doctor, nurse, hospital and nursing home; and (g) expenditure on clinical test. During the survey respondent was asked about the expenditure on the above-mentioned heads of children for the last 365 days. Total expenditure on this account is divided by 12 to get monthly 'expenditure on health and education of children'.

Following factors influence spending on education and health of children:

i. Mean Education of the Household : In an educated household, it is expected that they will realise the benefit of good health and education for the better future of their child. Therefore, in an educated household it is expected that 'expenditure on education and health of children will be higher'.

ii. Gender of the Household Head : There are ample evidences that if credit is channeled through women, then a significant portion of that credit goes to the betterment of children. In a woman-headed household it is expected that spending on children's health and education will be higher compared to male-headed household.

iii. The Highest Level of Female Education : Higher female education in the household will put more emphasis in the spending on children's education and health. Higher female education should have some positive impact on this spending.

iv. Occupation of the Household Head : We postulate that if the occupation of the household is non-agriculture, then spending will be higher in children's education and health. The variable is a dummy variable, and agriculture is the reference category.

Table 3 : Impact of Borrowing from SGSY Programme on the 'Expenditure on Temptation Good' Across SRCs

SRCs Variables	UC	OBC	SC	Muslims
Constant	-1.964 (1.537)	6.238* (1.48)	6.70* (1.26)	4.15* (.515)
Mean Education of the Household	-.338** (.152)	-.066* (.018)	-.052 (.074)	-.104 (.135)
Gender of Household Head (Ref : Male)	.109 (.123)	.132 (.114)	.1607 (.99)	.06 (.081)
Highest Level of Female Education in the Household	-1.201* (.044)	-.089** (.043)	-.103 (.068)	.029 (.187)
Occupation of the HH	-.214 (.178)	-.381** (.184)	-.1513 (.162)	.263 (.191)
No. of Working Adults (Ref : Agriculture)	.279 (.189)	.32 (.256)	.237 (.136)	.162 (.109)
Participation in SGSY Programme (Ref : Non-participation)	-.625* (.221)	-.867* (.322)	-.105(.307)	.355(1.48)
Participation in SGSY Programme				
Constant	-.64 (3.137)	-13.57 (10.25)	-6.60 (5.42)	-.475 (2.86)
No. of Years Living in the Same Locality	.054 (.124)	.493 (.302)	.045 (.185)	.535** (.245)
Index of Women's Access to Public Office	-.327 (.22)	.662 (.478)	.376 (.284)	.099 (.273)
Household's Social Capital	.027 (.116)	.483 (.371)	.0607 (.114)	.025 (.075)
Education Level	.112** (.057)	.546* (.195)	-.03 (.031)	.169 (.186)
Education Level ²	-.076** (.043)	-.01 (.08)	-.012 (.043)	-.012 (.012)
Wealth	.063 (.06)	.706** (.342)	.097 (.106)	.013 (.037)
Wealth ²	-.249 (.324)	-.041 (.178)	-.2694 (.261)	-.074 (.081)
Gender of Household Head	.73** (.37)	.744 (.656)	.871** (.34)	.145 (.141)
Wald Chi ²	36.37	24.28	54.27	35.07
Prob> Chi ²	0.000	.0039	0.000	0.000
Δ (Lambda)	-.584* (.194)	-.383** (.149)	.309** (.141)	-.405** (.18)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

v. *Number of Working Adults* : Number of working adults has been taken as proxy of economic status. An affluent family will put more emphasis on the education and health of children.

vi. *Number of Children* : There should be a positive correlation between number of children and spending on education and health.

vii. *Participation in SGSY Programme* : Through participation in SGSY-run SHGs, participants, particularly women become familiar with the outer world. They become aware about the better health and education of the children. Therefore, programme participating households could have higher spending on children's education and health.

Participation in SGSY programme increased 'expenditure on children's health and education' across all SRCs; however, we get a significant impact on the participants of UC and OBC communities. It further corroborates that even after removing selection bias, the impact of SGSY programme participation has varied impact across different castes and creeds. Enhanced income and greater awareness regarding children's health and education through participation in SGSY programme may encourage parents to spend more on children. Among other explanatory variables, education of the household head has a positive and significant impact on this spending. If the occupation of the household head is non-agriculture, then household's spending for children's schooling and health will also rise. Number of working adults, a proxy of economic status, has significant positive impact on the spending for OBCs and SCs, not for UCs or OBCs. 'Number of children' has a positive and significant influence on the spending for the members of UC community only. Among the explanatory variables of SGSY programme participation, all variables except

square values of education and wealth have positive impacts on the likelihood of participating SGSY programme. In the woman-headed household the likelihood of participating in the SGSY programme is significantly higher compared to the reference category. Wald statistics show, goodness of fit of the model is high across the regression equations of all SRCs. Significant values of lambda show the existence of selection bias if equation (7) is estimated without considering equation (8).

Impact on Business Expenditure

Business Expenditure : Following Banerjee et al (2009), business has been defined as an activity conducted to earn money where one is not someone's employee. Business expenditure means expenditure to start a new business or expand existing business. It includes: (a) working capital; (b) expenditure on the asset; (c) inputs and (d) wage bill (number of employees multiplied by existing market wage). Employees are individuals who earn a wage for working for someone else. Household members are not considered as employees. Following are the determinants of business expenditure.

i. *Mean Education of the Household* : Education will increase one's confidence, and she will be willing to take bigger project. Therefore, education will increase business expenditure.

ii. *Age of the Household Head* : Higher age will dampen the spirit of taking bigger investment; therefore, there should be a negative relationship between age of the household head and business expenditure.

iii. *Occupation of the Household Head* : If the occupation of the household head is non-agriculture, then we expect a positive relationship between occupation and business expenditure.

Table 4 : Impact of SGSY Participation on 'Expenditure on Children's Education and Health'

SRCs Variables	UC	OBC	SC	Muslims
Constant	30.45*(5.52)	36.22** (11.06)	20.19** (9.66)	25.46* (4.75)
Mean Male Education of the Household	1.51* (.42)	2.708** (1.136)	1.6 (1.523)	1.097 (1.270)
Gender of the Household Head (Ref : Male)	.66 (.5)	.696 (1.21)	.88 (.713)	.638 (.407)
Mean Female Education	.187 (.16)	.22 (.331)	.23 (.218)	.199 (.203)
Occupation of the Household Head (Ref : Agriculture)	.205* (.069)	.156 (1.27)	.54 (1.13)	.474 (.540)
Number of Working Adults	.28 (.39)	1.94* (.759)	2.54* (.65)	.452 (.338)
Number of Children	.502** (.21)	.182 (.392)	.28 (.32)	.2 (.1606)
Participation in SGSY Programme (Ref : Non-participation)	4.5* (2.17)	8.902* (2.92)	1.36 (1.60)	1.416 (.898)
Participation in SGSY Programme				
Constant	-2.35 (1.76)	-1.64 (1.13)	2.045 (1.85)	-6.608 (5.426)
No. of Years Living in the Same Locality	.053 (.071)	.054 (.124)	.037 (.028)	.045 (.185)
Index of Women's Access to Public Office	.205 (.134)	.327 (.22)	.260 (.214)	.376 (.284)
Household's Social Capital	.078 (.073)	.027 (.116)	.030 (.031)	.06 (.114)
Education Level	.111 (.012)	.112 (.57)	.12 (.43)	.309 (.31)
Education Level ²	-.158 (.24)	-.76(.53)	-.57 (.46)	.122 (.439)
Wealth	.013 (.0414)	.063 (.060)	.069 (.261)	.097 (.106)
Wealth ²	-.013 (.037)	-.028 (.046)	-.051 (.040)	.069 (.061)
Gender of Household Head	.562** (.241)	.73** (.37)	.608 (.426)	.871* (.330)
Wald Chi ²	44.17	36.59	52.81	28.73
Prob> Chi ²	0.000	0.0001	0.00	.0014
Λ (Lambda)	.214** (.123)	.564* (.184)	.201** (.098)	-.202* (.053)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

iv. Any Prior Business Experience : Some prior knowledge of business will encourage the investor to invest in a relatively large project. Therefore, any prior business knowledge will increase business expenditure.

v. Number of Dependents on the Family : More dependent members in the family reduce surplus for investment in business. Therefore, we can get a negative relationship between business expenditure and number of dependents in the family.

vi. Number of Working Adults in the Family : As we take the number of working adults as a proxy of the economic status of the family, an economically better-off family will be more akin to take a larger project.

vi. Participation in SGSY Programme : SGSY programme participants get easy access to credit and subsidy. It helps them to invest more. So, we anticipate a positive relationship between 'business expenditure and participation in SGSY.'

Participation in SGSY programme has significantly increased business expenditure for all the programme participants across SRCs except Muslims. Business expenditure increased 1.16, 1.72 and 1.627 times for UC, OBC and SC programme participating households compared to non-programme participants. This impact is net of observed selection bias. Values of lambda show presence of selection bias in the model. All SHGs of our sample are four years old. Amount of credit or subsidy that an SHG gets depends on whether it has passed grade-I or grade-II. The success in graduation test depends on regularity of repayment, internal lending and subscription to group corpus. Most of the Muslim-SHG were unable to perform better on these criteria. As a consequence they got smaller amount of credit or subsidy, and failed

to invest more in their business. 'Age of the household head' has a strong negative effect on the business expenditure across all SRCs. Higher age restricts individual to invest in a comparatively expensive project. If the occupation of the household head is non-agriculture, then the expenditure on business will be higher. We got a positive and significant impact on UCs and OBCs. More working adults in the household bring more money in the home, and a portion of that money is invested in the business. We got a positive impact of the number of working adults for the programme participants of all SRCs, however, significant for SCs and UCs. More dependents in the household reduced business expenditure across all the programme participants, but significantly more compared to the control group across the households of UCs and SCs. Education and business skills have some insignificant positive impact on business expenditure.

Business Profit

Business profit has been defined as monthly business revenue less monthly input cost. Regarding business revenues respondents were asked : 'how much of the item did you sell in the last month, and how much did you get for them'.

Following are the determinants of profitability :

i. Mean Education of the Household : In an educated household it is expected that the business will be run in a more efficient way. We postulate a positive relationship between education of the household and profit.

ii. Any Prior Business Experience : Any prior business experience will help the entrepreneur to invest her money in most profitable venture given the existing forward and backward linkages. Therefore, prior

Table 5: Impact of SGSY Participation on Business Expenditure

SRCs Variables	UC	OBC	SC	Muslims
Constant	32.63*(3.86)	17.98*(3.73)	17.86*(3.36)	29.15*(3.13)
Mean Male Education of the Household	.284(.16)	.261(.361)	.205(.186)	.391(.314)
Any Prior Business Experience (Ref : No Business Experience)	.1(.179)	.257(.325)	.363(.273)	.352(.258)
Age of the Household Head	-.465*(.146)	-.184(.234)	-.837*(.239)	-.419**(.199)
Occupation of the Household Head (Ref : Agriculture)	2.56*(.214)	2.204*(.288)	.569(.383)	.679(.411)
Number of Working Adults	.8*(.238)	.525 (.452)	1.016**(.38)	.231(.335)
Number of Dependents in the Family	-.143(.182)	-.134(.129)	-.204***(.112)	-.094(.115)
Participation in SGSY Programme (Ref : Non-participation)	1.16**(.601)	1.72**(.822)	1.627*(.608)	.672(.783)
Participation in SGSY Programme				
Constant	2.35(1.75)	-2.329(4.09)	-6.608(5.42)	-2.64(3.13)
No. of Years Living in the Same Locality	.005(.071)	.044(.125)	.045(.185)	.054(.124)
Index of Women's Access to Public Office	.205(.134)	.287(.227)	.376(.284)	.327(.22)
Household's Social Capital	.011(.073)	.037(.118)	.06(.114)	.027(.116)
Education Level	.078(.073)	.109**(.053)	.0309(.031)	.112(.057)
Education Level ²	-.015(.025)	-.077***(.043)	.012(.044)	-.076***(.043)
Wealth	.001 (.041)	.067 (.06)	.097(.106)	.063(.060)
Wealth ²	-.0129 (.037)	-.031 (.047)	.269(.261)	-.027(.046)
Gender of Household Head	.73**(.37)	.72** (.31)	.871*(.320)	.561(.241)
Wald Chi ²	63.89	22.59	42.49	99.04
Prob> Chi ²	0.000	0.02	0.000	0.000
Δ (Lambda)	-1.366***(.682)	-1.004**(.503)	-1.14*(.364)	1.286*(.358)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

business experience should have some positive impact on profitability. This variable is a dummy variable, and reference category is 'no prior business experience'.

iii. Risk Perception⁹: If the risk perception of the entrepreneur is very high, then she will invest her money in that project which is less risky. Return from the investment in traditional activities like livestock rearing or land leasing is very low. Therefore, risk perception could have a negative impact on profitability.

iv. Nature of Business : If the nature of business is agriculture or allied activities like livestock rearing, then there is less likelihood of earning more profit. On the contrary, petty trade or services bring more profit for the investor. This variable is a dummy variable where 'agriculture or allied activities' is the reference category.

v. The Unemployment Rate in the Family: Here unemployment has been defined as percentage of a household's labour force without a job and currently seeking employment. More unemployed persons in the household will reduce the cost of labour, and profit from the investment will be higher.

vi. Women's Control Over the Asset : Women's control over asset might or might not increase profit from the investment. Women's control over asset may channel credit in productive investment instead of temptation good. It could also force male counterpart to invest money in those projects, which yield a low but certain flow of income.

vii. Participation in the SGSY Programme : SGSY programme participants get subsidised credit, subsidy and vocational training. Programme participants are organised in SHGs. SHGs inculcate a sense of self-confidence among the programme participants. Therefore,

it is expected that programme participation will enhance profitability.

Participation in SGSY programme has a significant impact on 'business profit' across all SRCs except Muslims. Participants in SGSY programme get not only subsidised credit and subsidy, but also marketing support, technical expertise and other support services that make a micro-enterprise profitable. Education has a positive influence on the profitability. Risk perception has detrimental effects on 'business profit', and it is significant for UCs only. If the nature of business is non-agriculture, then the likelihood of making higher profit rises. Higher unemployment rate means there is some surplus labour in the household. Most of the micro-enterprises are home based. They absorb this additional surplus labour. However, households do not have to pay any additional wage for this surplus labour. From the above regression we see a positive impact of higher unemployment in the household on profitability. Woman's control over asset has some mixed impact on the business profit. It has strong significant and positive impact across UCs and OBCs. On the contrary we get a negative impact, though insignificant, of women's control over asset on business profit across SCs and Muslims. Among explanatory variables for the participation in SGSY we get a significant impact of education for UCs and OBCs. However, there is the non-linear negative effect of education on the participation in SGSY programme. It corroborates a higher opportunity cost of highly educated people. Wealth has a positive impact on the likelihood of joining the programme. Gender of the household head also has some significant impact on the likelihood of participation. Goodness of fit of the model is quite high for all the regression equations, and values of lambda show necessity of treatment effect model.

Table 6 : Impact of SGSY Participation on 'Business Profit Across SRCs'

SRCs Variables	UC	OBC	SC	Muslims
Constant	20.67*(8.68)	36.228*(11.063)	25.46* (4.75)	18.21 (19.85)
Mean Education of the Household	1.27**(0.58)	2.70**(1.13)	.452(.338)	2.1(1.43)
Prior Business Experience (Ref : No Business Experience)	.13**(0.071)	.696(1.21)	.638(.407)	.129(.164)
Index of Risk Perception	-.047**(0.025)	-.044(.35)	-.009(.1050)	-.008(.055)
Nature of Business (Ref : Agriculture)	.236**(0.104)	.156(1.275)	-.473(.54)	-.26(.243)
Unemployment Rate in the Family	.343*(.093)	3.3**(1.4)	.519(.467)	.477**(0.256)
Women's Control Over Asset (Ref : No control)	1.18***(.07)	2.244**(.865)	-.453(.322)	-1.79(.158)
Participation in SGSY Programme	4.15*(1.311)	8.902*(2.925)	3.416*(.896)	2.402(2.76)
Participation in SGSY Programme				
Constant	2.35(1.76)	-.64(3.137)	-6.608(5.426)	.821(1.985)
No. of Years Living in the Same Locality	.05(.71)	.54(.124)	.045(.185)	.153(.156)
Index of Women's Access to Public Office	.205(1.34)	.327(.22)	.376(.284)	.0805(.280)
Household's Social Capital	.078(.073)	.027(.116)	.0607(.114)	.022(.179)
Education Level	.126**(0.067)	.112*(.057)	.030(.031)	.0111(.012)
Education Level ²	-.076**(0.043)	-.0158(.025)	.0122(.0439)	-.0536(.047)
Wealth	.013(.37)	.063(.06)	.8711**(.3408)	.068(.094)
Wealth ²	-.0134(.041)	-.027(.046)	.269(.261)	-.1886(.196)
Gender of Household Head	.561*(.241)	.73**(.37)	.213(.501)	.367(.439)
Wald Chi ²	45.73	36.59	28.73	24.87
Prob> Chi ²	0.000	0.0001	.0014	.0031
Λ (Lambda)	-6.92* (1.89)	-5.64*(1.84)	-3.024*(1.030)	-6.44*(3.44)

*, ** and *** imply significance at 1, 5 and 10 % level of significance.

Conclusion

The Hindu caste system has been developed as an extremely hierarchical social system. SC women face fewer social restrictions and, by virtue of being independent earners, enjoy greater financial autonomy and increased control over household financial decisions relative to UC women (Mencher, 1988). Notably, these restrictions on female autonomy among UCs are not limited to the wealthy (Eswaran, 2009). Relative to Hindus, Muslims in India place more restrictions on women. In general, the returns to SHG participation should be higher for those least fettered by conservative social norms. However, this need not be the case for an intervention that primarily influences women's knowledge and aspirations. If traditional norms about gender roles can be challenged, or if intervention mainly works to expand women's exposure, knowledge and opportunities, then returns from SHG participation may be higher for women from more restrictive social groups (Field, 2010). In our sample all SHG members and non-members are women. The result of this paper corroborates above ideas. UCs got maximum benefits, whereas Muslims got least benefits from participating in SGSY programme. In estimating the impact of SGSY participation across socio-religious communities, we have used 'Treatment Effect

Model'. The model removes selection bias arising from observed heterogeneity. Therefore, given the identical socio-economic conditions, difference across groups in their response to micro-finance programme participation is stark. One possible explanation of this differential treatment effect is that samples are not balanced across socio-religious communities in terms of unobservable characteristics. 'Treatment Effect Model' cannot remove bias arising from unobserved heterogeneity.

All the SHG members of our sample were women. As Muslim women face more social restrictions compared to the members of other SRCs, it might reduce the benefit of SGSY programme participation. A high level committee chaired by Justice Rajendra Sachar¹¹ depicted a precarious socio-economic condition of Muslim community including Muslim women. 'The Committee' prescribed some policies to uplift the community from its existing conditions. However, political parties are more eager to reservation in jobs and educational institutions than providing primary education, basic health facilities, technical knowledge, higher amount of credit, and creating backward and forward linkages. Betterment of this downtrodden section requires a holistic approach rather than treating as a vote bank.

Notes

1. If any member of the group fails to repay the loan, the entire group will be responsible for the repayment of a loan.
2. Repayment of existing loan ensures higher amount of future loan.
3. A portion of the subsidy is retained by bank officials, and paid after the repayment of the entire loan.
4. Those who are participating in the SGSY programme.
5. A survey was conducted both in programme and non-programme villages. Programme village means where some of the villagers have already become members of SGSY-run SHGs. The programme villages in the Kandi sub-division were Salar, Raigram, Agardanga, Alugram and

Masla, and in the Berhampore Sub-division were Bazarsau, Kamnagar, Saktipur, Mirzapur and Simuldanga.

6. Non-programme village means not a single villager has become a member of the SGSY-run SHG. The non-programme villages in Kandi sub-division and Berhampore sub-division were Berbari, Bhabanipur, Ibrahimpur and Sonar Gram.
7. Women's access to public offices and processes of political activities imply casting vote at own will; attending 'Village Council' meeting; whether known about the legal rights of the women and different government programmes and schemes going on in their locality; and participating in political campaigns.
8. Household's social capital is computed as involvement of the household members in different organisations like 'Village Education Committee (VEC)', 'Water Users Associations', 'Festival Committee', 'Local Clubs' and political parties.
9. This index has been constructed on the basis of respondents' answer in aspects like: (a) incidence of idiosyncratic shocks, health hazards, death of the family members etc.; (b) covariate shocks, drought, cyclone flood etc., in last two years; (c) number of repayment failure to moneylenders and banks, and (d) number of dependent family members in the households.
10. At least after six months of the formation of the group, each group may appear in 'grade-I' test. If they qualify 'grade-I' then they become eligible to get 'revolving fund'. Revolving fund comprises credit from both DRDA and commercial banks. SHGs do not have to pay any interest for the loan from the DRDA, however, they have to pay interest for the credit from a commercial bank. The size of the 'revolving fund depends on the size of the group corpus'.
11. A high-level committee was formed under the chairmanship of Justice Rajinder Sachar, ex-judge, the Supreme Court of India, to review the socio-economic conditions of the Muslim community. The committee submitted its report in 2005.

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