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Can Weak Ties Create Social Capital? Evidence from Self-Help Groups in Rural India

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Abstract

The "strength of weak ties" has been established in the context of labour market outcomes, with theoretical and empirical investigation showing how weak ties lead to an increase in mobility and job opportunities. The impact of weak ties on community organisation is less well understood. We contribute to this literature by investigating if weak ties, generated via membership of livelihood programmes, can lead to the creation or enhancement of social capital. Based on data from one of the largest independent primary surveys for India, we find that participation in self-help groups had little impact on livelihoods, but led to the creation of significant social capital, as measured by indicators related to personal efficacy and collective action. The bulk of existing evidence on livelihood programmes is based on small samples. Our large sample size and innovative survey design allow us to detect a larger number of effects with greater certainty. We argue that the social capital generated by the programme is a significant positive impact (even though the main target of the programme is to strengthen livelihoods), as it strengthens the process of women's empowerment.

JEL Classification Codes: O20, O22, J16
Keywords: Rural Livelihoods, Self-Help Groups, Social Capital, Women's Empowerment, India

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1 Introduction

Mobilising the poor, especially women, into Self-Help Groups (SHGs) is a commonly used policy across the developing world to create and sustain livelihood opportunities and reduce poverty. The main focus of these interventions is economic empowerment of SHG members and their households, and therefore, the primary expected impact is transformation and/or enhancement of livelihood opportunities for rural women. To be fair, studies of SHGs or micro-finance groups do explore other possible impacts, such as greater autonomy or increase in women's empowerment. However, an implicit assumption in the literature is that these impacts are either a) subsidiary or corollary, and/or b) results of better livelihood opportunities, and/or greater economic freedom. In other words, the mechanism through which these "subsidiary" impacts take effect is through greater economic empowerment.

However, the international literature shows mixed effects of SHGs on livelihoods (Banerjee et al., 2015; Brody et al., 2015; Morduch, 1999; Goetz and Gupta, 1996; Datta, 2015), with some studies finding stronger livelihood impacts than others. In other words, existing evidence indicates that the primary impact is not necessarily significant, but what is assumed to be the secondary or corollary impact (*viz.*, various empowerment indicators) is most often realized, and might be the stronger effect. This presents a puzzle, if we continue to regard the livelihood impact as the main pathway to other 'subsidiary' impacts. Barooah et al. (2019), in a systematic review of existing impact evaluations of the Indian programmes, highlight significant gaps in the evidence landscape. They show that one, some impacts are studied more often than some others; and two, that impact evaluations "do not adequately address why, how and for whom impacts occur or not" (p. iii). Their analysis reveals that the pathways through which livelihoods programmes result in the impacts they do are not very well studied and well understood.

Most of this evidence is based on small experimental studies. A key question, which is not discussed as often, is that of statistical power and precision of the studies. Dahal and Fiala (2020) demonstrate that most experimental studies, which form the evidence on the impact of micro finance on livelihoods or poverty reduction, are underpowered. This results in large impacts that are not statistically significant, which leads them to conclude that "we still know very little about the impact of microfinance" (p.1). They pool data from eight previously published studies, and find that their pooled estimates are more realistic in terms of impact size and are significant.

The big strength of our study is that it is well-powered due to a very large sample size. Our large sample, along with an innovative survey instrument, allows us to detect a larger number of effects with greater certainty. Using data from among the largest independent primary surveys conducted in rural India, this paper investigates if the creation of "weak" economic ties (via SHG membership) can create or augment social capital (defined below),

and contribute to the process of empowerment of women. We argue that regardless of the intended objective, the main impact of SHGs on the ground could be the creation or enhancement of social capital, which has the potential to strengthen the process of women's empowerment.[1] This creation or enhancement of social capital may not be the result of improved livelihoods, but by establishing small communities based on economic ties.

This mechanism is suggested by Sanyal's (2009) sociological analysis, which is based on interviews with participants in microcredit groups. However, her study focuses on women who are already members. Since there are no comparisons with non-members, we cannot be certain that the outcome (greater social capital) is due to the intervention, *viz.* creation of weak economic ties through membership in microcredit groups.

Granovetter's (1973) seminal paper discusses elements that define the strength of an interpersonal tie[2], and suggests that "whatever is to be diffused can reach a larger number of people and traverse greater social distance when passed through weak ties rather than strong" (p. 1366). This well-known "strength of weak ties" mechanism has been adequately explored in the context of labor market outcomes, where information about job opportunities from weak ties can lead to better jobs or upward mobility. In this paper, we demonstrate that Granovetter's prediction about weak ties and community organization – "weak ties ... as indispensable to individuals' opportunities and to their integration into communities; strong ties, breeding local cohesion, lead to overall fragmentation" (p. 1378) stands up to evidence. In other words, the "strength of weak ties" extends beyond the labor market into community organizations by promoting the creation of social capital.

1.1 SHGs and Social Capital

As Ostrom (1994) points out, unlike physical capital, which is obvious to onlookers, social capital "may be almost invisible unless serious efforts are made to inquire about the ways that individuals organize themselves...". She highlights that social capital is the "arrangement of *human resources* to improve flows of future income"; "created by individuals spending time and energy working with other individuals to find better ways of making possible the achievement of *certain ends* that in its absence would not be possible". (p.528) (emphasis added). There are two key elements in this definition of social capital that we have emphasised. One, we note that "certain ends" need not be confined to future income, but can include other outcomes, such as decision-making, as we explore below. Two,

[1] We agree with Kabeer(2005) that micro-finance is not a 'magic bullet' for women's empowerment, but like other policies, has the potential to contribute to the process of women's empowerment.

[2] He suggests that the strength of an interpersonal tie is a (possibly linear) combination of the amount of time, emotional intensity, intimacy (i.e. mutual confiding) and reciprocal services which characterize the tie. Each of these is somewhat independent but highly correlated.

"human resources" need not be narrowly defined as education or skill. Human resources could be "actual and potential resources, such as trust, information, effective social norms"; "propensity to undertake mutually beneficial collective actions" (Krishna, 2002), that are linked to a "durable social network of more or less institutionalized relationships of mutual acquaintance and recognition."

There is debate on whether social capital is historically pre-determined, or can be created. One side of the debate argues that social capital can be created "when relations among persons change in ways that facilitate action" (Coleman, 1988). This is an important point in our context, as the creation of SHGs leads precisely to a change in the relationships among people, or creates relations when none existed, and this change is meant to facilitate action. Thus, the formation of SHGs enables the creation of social capital. We show specifically that membership of SHGs directly alters "arrangement of human resources in a variety of ways", e.g. it increases access to information.

Sanyal (2009) outlines a link between participation in SHGs and the creation of social capital. She suggests that "micro-finance institutions may facilitate women's collective empowerment by fostering the formation of weak ties", which are capable of transmitting not just information but also feelings of solidarity and group commitment.

We focus on this link by noting that in an SHG women know each other as fellow group members, i.e. are acquaintances, rather than being strongly tied by kinship or personal friendships. These group members have ties to individuals who are not tied to the woman, thereby fulfilling a crucial definition of weak ties. The process of SHG functioning also results in other weak ties, for instance, the indirect ties between the woman and members of geographically proximate groups; or the woman's ties with NGOs or local government staff. The "strength of (these) weak ties" increases members' social capital, which is manifested in the increase in personal efficacy (information, possibility to improve flows of future income), as well as through an increased propensity for collective action for societal good.

1.2 Main Contributions

We investigate these channels by comparing outcomes of women who are SHG members to non-members. The data come from a primary survey that is among the largest independent (i.e. non-institutional) surveys for India, covering almost 10,000 households across 334 villages in the state of Maharashtra. In addition to standard survey questionnaires, our methodological innovation lies in including vignette questions to elicit differences in personal efficacy and propensity towards collective action. Vignettes are typically not a part of large-scale surveys; we included simple but pointed vignettes that allowed us to document responses to questions that are ordinarily not easy to gauge through routine

survey instruments. Thus, we are able to detect effects that might have gone undetected in smaller studies. Also, our innovative survey design allows us to examine a far greater range of questions than typically examined in the literature.

Given that selection into SHG membership is voluntary, and because random assignment into membership was not possible in our context for reasons explained in Section 2, correction for selection bias is critical to the analysis. We use the relatively recent Entropy Balancing (EB) method which, to the best of our knowledge, has not been used in empirical studies by economists. The nuanced data from our survey, combined with data from the national census, allows us to construct a large set of covariates on which we balance members with non-members, allowing us to attribute the differences between the two groups to the programme. The standard methods in the literature use matching estimators such as propensity score matching (PSM) (that we use as a robustness check), or a range of other methods such as difference-in-differences, instrumental variables, or multivariate cross-sectional studies with or without Heckman selection. As Brody et al. (2015) suggest, all these studies are "able to correct for selection bias under specific circumstances" (p. 21). Our methodology (at least weakly) improves upon standard matching estimators.

Our main results are that the livelihood impacts of the programme are weak. 95 percent of the members do not report of any new income generating activity that they started using SHG funds. However, despite the weak impact on livelihoods, we find significant and strong impacts on a range of indicators related to political participation, knowledge of administration, financial literacy, mobility and decision making. Members have a greater propensity towards collective action and a higher sense of personal efficacy, even in the context of complex social problems. We find that these results are stronger for members from lower-ranked, marginalised and stigmatised caste and tribal groups, who are typically at the bottom of the socio-economic hierarchy, with limited agency and say.

The rest of the paper is organised as follows. Section 2 outlines the context of the study and details of the data. Section 3 outlines the methodology. Section 4 has results in two subsections: economic impacts and non-economic economic impacts. Section 5 discusses the findings in relation to the existing literature, and Section 6 offers concluding comments.

2 Context and Data

2.1 Context: Rural Livelihoods Schemes in India

Indian central government schemes to promote self-employment have gone through many transformations, each new scheme subsuming earlier ones. The current scheme, National Rural Livelihoods Mission (NRLM), has been in operation since 2011. NRLM in Maharash-

tra is called Maharashtra State Rural Livelihood Mission (MSRLM), or "Umed".[3] There are several challenges in gauging the specific impact of MSRLM, as there are no clear control or untreated areas. This is because Maharashtra has a long history of non-governmental SHGs, which exist in non-programme areas as well. Additionally, since pre-existing schemes are subsumed under MSRLM, specific attribution to the current scheme is problematic. Integration of pre-existing schemes implies that isolating incremental impact of MSRLM SHGs very difficult in a single cross-sectional survey. This study is an impact of SHG membership (regardless of the scheme under which the SHG was started) on a range of outcomes related to livelihoods and various social capital indicators.

2.2 Sample Selection

The primary survey was conducted between December 2014 and May 2015 in selected rural blocks of the 10 poorest districts of the western state of Maharashtra in India. Figure 1 shows the map of Maharashtra, where the surveyed districts have been marked. Since the survey was launched after the MSRLM intervention was already underway, before choosing the sample, we first used data from the Primary Census Abstract (PCA) of the 2011 census to verify the criteria used by MSRLM to identify the first set of villages to roll out the programme. This analysis revealed that MSRLM was targeting larger villages, with larger Scheduled Caste (SC)/Scheduled Tribe (ST) populations.[4] We used the same criteria to choose villages (our first-stage sampling units (FSUs)) across the ten districts. The second stage in the sampling involved the selection of households. In order to avoid clustering and to better capture the underlying variability, we chose 30 households per village through random sampling by first organizing household lists according to hamlets inside the village.[5]

One of the innovations of this survey was the development of a new computer assisted personal interviews (CAPI) tool, which replaced the older pen-and-paper interviews (PAPI). The team of researchers had several rounds of interaction with the MSRLM team to discuss the pros and cons of the two methods. The CAPI instrument was piloted several times till

[3]Umed means hope in Marathi, the official state language. The institutional details of MSRLM are outlined in Appendix A.2.

[4]These are lists of castes and tribes designated as beneficiaries of affirmative action due to historical and current discrimination, stigmatization and marginalization. Despite within-group heterogeneity, this group of castes and tribes are at the bottom end of any socio-economic indicator and continue to suffer significant disadvantage relative to higher ranked castes. Affirmative action is also targeted towards an intermediate group of castes and communities called "Other Backward Classes" or OBCs, which are groups that might be socially low-ranked, but are far more heterogeneous in terms of assets, especially land ownership. See Deshpande and Ramachandran (2019) for the latest evidence on the relative positions of these groups.

[5]After the research team selected the actual sample of households for each village, the staff of the survey agency Nielsen conducted the actual survey. The research team was involved in the training of the team as well as in the monitoring of the survey throughout. We conducted regular back-checks in already surveyed villages to verify the quality of the data.

it functioned smoothly before it was launched in the field. We believe this significantly improved the quality of our survey data, as other studies have demonstrated how CAPI has significantly lower measurement errors compared to PAPI surveys.

There were four components to the primary survey: village module; SHG module, household survey and a separate survey administered to women. The final sample consists of 9913 households, covering 50,017 individuals, spread over 334 villages. This is amongst the largest independent (i.e. non-institutional) primary surveys focused exclusively on rural areas, with data on a broad range of socio-economic indicators dealing with rural livelihoods, women's autonomy and empowerment indicators. In addition to the standard questions that can be found in all large data sets, our instrument tried to elicit responses to several new and nuanced questions. Our data set is unique also because it contains vignettes, which are typically not included in large-scale surveys. Thus, this survey represents a rich depository of data.

The household questionnaire was administered to the head of the household, assumed to be the chief decision maker in most cases. In cases where the household head was not available, the interview was carried out with an adult member of the household, who could provide information about the day-to-day details about individual household members. The women's questionnaire was administered to adult ever-married women between the ages of 18 to 50 years. If such a woman was not present, it was administered to a woman above 50 years or below 18 years in decreasing order of preference, depending upon availability.

3 Methodology

3.1 Causal Effects in Non-Experimental Studies

In an experimental setting, causal effects are easy to identify, as assignment to treatment is randomized, with treatment and control groups being drawn from the same population. However, in observational data, the treatment status is not randomized, and selection into SHG membership happens for reasons related to both observable and unobservable characteristics, which would also shape outcomes. In other words, in observational data, the outcome and the treatment are not necessarily independent, as there exist covariates (X) that affect both the treatment and the potential outcome. This is a methodological challenge because we cannot ascertain to what extent differences in outcomes can be attributed to the intervention. Even if we controlled for differences in pre-intervention variables, it would not help establish causality when treatment and comparison groups are dissimilar, and when there are many pre-intervention variables.

3.2 Estimating Treatment Effects for a Binary Treatment: Potential Outcome Models

In the case of a binary treatment, there are two potential outcomes for individual i: y_{i0} and y_{i1}

Let T denote a random treatment. T_i denotes the treatment received by individual i; $T_i = 1$ implies that individual i is treated; and $T_i = 0$ implies that individual i is part of the control group, i.e. not treated.

Observed outcome for individual i would be $y_i = T_i y_{i1} + (1 - T_i) y_{i0}$

However, only one of y_{i0} or y_{i1} can be observed for any individual, i.e. every individual in the sample is either treated or not.

The treatment effect for individual i would be $y_{i1} - y_{i0}$.

To estimate the effect of treatment, this asks us to consider what the potential outcome would be had the treated individual not been treated, or vice versa. This involves estimating a counterfactual because y_{i0} is not observed for the treated units, and y_{i1} is not observed for the untreated units.

The Average Treatment Effect for the population would be

$$ATE = E(Y_1 - Y_0) \tag{1}$$

The Average Treatment Effect on the Treated would be

$$ATET = E(Y_1 - Y_0|T = 1) = E(Y_1|T = 1) - E(Y_0|T = 1) \tag{2}$$

In experimental studies, treatment assignment is forced to be independent of potential outcomes: $Y_1, Y_0 \perp T, \Rightarrow E(Y_0|T = 0)$ can be used as an estimate of $E(Y_0|T = 1)$

In observational studies, selection into treatment is based on covariates, and therefore, the two values are not equal. Thus, the conventional solution is to assume that $Y_0 \perp T|X$: conditional on all confounding covariates, the potential outcomes are stochastically independent of T.

3.3 Entropy Balancing and Propensity Score Matching

Matching estimators use the average of outcomes of the "nearest" or "matched" individuals to impute the missing potential outcome for each sampled individual. The difference between the observed outcome and imputed potential outcome is taken as the estimate of the individual level treatment effect. One such commonly used matching method is Propensity Score Matching (PSM), which determines the "nearest" individuals by using estimated treatment probabilities known as "propensity scores". This method combines all the covariate information to estimate treatment probabilities. The estimated propensity score, which is a single variable on the unit interval that summarizes pre-intervention variables, can control for differences between treatment and comparison groups.

Hainmueller (2012) develops entropy balancing (EB) as an alternative technique to achieve covariate balance in observational studies with a binary treatment. This is essentially a re-weighting scheme that assigns a scalar weight to each sample unit, such that the re-weighted groups satisfy a set of balance constraints that are imposed on the sample moments of the covariate distributions. The balance constraints ensure that the re-weighted groups match exactly on the specified moments.

The main difference in the two approaches is the following: matching estimators (e.g. PSM) estimate propensity scores (through logit or probit regression of the treatment indicator on the covariates) and then compute balance checks to see if the estimated weights equalise the covariate distributions. These methods either retain or discard units (apply a weight of 1 or 0) based on which units equalise the covariate distributions. Entropy balancing, in contrast, re-weights units appropriately to achieve balance, but keeps the weights as close as possible to the base weights (if any) to prevent loss of information. Thus, in our case, since we are comparing members with non-members, the former would be given a weight of one, and they would be matched with non-members with a set of weights such that covariates for the group match in terms of the first two (and possibly higher order) moments. With this re-weighting scheme, Hainmueller (2012) demonstrates that EB always (at least weakly) improves upon the balance that can be obtained by matching estimators.

3.4 Treatment, Covariates and Outcomes

Since we are interested in the effects of SHG membership, we define the treatment (T) as a woman being an SHG member. We also use an alternative definition of treatment, where we focus only on members, and look at duration of membership as a binary treatment (longer versus shorter duration). The sample in the latter case is smaller, as it includes only members, but it takes care of the selection issue, as members would have greater similarity on unobservables than what would be observed between members and non-members.

The choice of covariates is crucial for the credibility of our results. As Oster (2019) argues, all nonexperimental work in economics is subject to omitted variable bias, and "the most straightforward approach to such concerns is to include controls that can be observed"(p.187). Observed controls would vary in their ability to fully capture a particular omitted variable, with some being better proxies than others. In principle, the omitted variable bias or selection bias could be addressed by a range of quasi-experimental design strategies used to capture causality, as Angrist and Pischke (2010) discuss. However, these designs are susceptible to concerns of external validity, which ultimately compel researchers to think carefully about appropriate controls. Since our study context does not allow an experimental or quasi-experimental framework, we use covariates carefully and comprehensively. As Oster (2019) argues, if a coefficient is stable after the inclusion of the observed controls, this can be taken as a sign that the omitted variable bias is limited.

We use covariates at three different levels by including individual, household and village-level characteristics. Data on individual and household level covariates come from our primary survey. We include data on whether the respondent is head of household, her years of education, whether she is currently married, her caste group, age, household size, household agricultural land ownership, and the highest level of male education in the household.

The village-level covariates come from two sources. From our survey, we use data on the gender of the *sarpanch* (head of local council) or *upsarpanch* (deputy head) and whether *sarpanch* belongs to the same caste group as respondent. From the 2011 Census, we use the SC-ST proportion in the village, village size, measured by the number of households, and village sex ratio to capture the degree of overall gender discrimination in the village.[6].

Garlick and Hyman (2018) analyse student achievement using test scores to proxy for achievement, in a context where selection into test-taking is determined by unobserved characteristics. They compare eight commonly used selection correction methods in terms of how closely each method predicts the mean, with each method used with three sets of controls (demographic, school-district and "all"). Comparing the mean squared error (MSE) across correction methods and covariate sets, they find that there is greater variation in MSE due to the covariate set, rather than the estimation method. In other words, the MSE is the lowest, often close to zero, as the covariate set widens to "all", regardless of the method.

Our full set of covariates is as comprehensive as possible, given that we are interested in determining the exact dimensions in which women's lives change as a result of SHG membership. Garlick and Hyman (2018)'s result gives us confidence that we are minimising

[6]Strong son preference leads to sex-selective abortions of female foetuses in several parts of India, and while this distorts the sex ratio at birth, we use the village sex ratio as a proxy for discriminatory attitudes towards women

any bias that would arise due to omitted variables. We balance members and non-members over all these covariates using EB, with PSM as a robustness check. As explained in Section 3.3, EB matches the sample of members with non-members that have a distribution of covariates similar to those of members, along the first three moments (mean, variance and skewness).

Table 1 shows the balance table for the covariates before and after weighting. 2083 women were members of SHG (treated units) and 7065 were non-members (control units). Focusing just on the means, before re-weighting, i.e. before EB, we see that the caste distribution of the treatment and control groups was different. Around 18, 22 and 34 percent of treatment group were SC, ST and OBC. [7] respectively, compared to around 13, 24 and 31 percent in the control group. The treatment group had lower proportion of nomadic tribes (12.7) compared to the control group (15.5). The treatment group had higher average respondent education (almost 5 years) and male education (9.6 years), compared to control (4.3 and 8.9 years respectively). Table 1 reveals that the differences were not confined to the means, but can be seen in variance and skewness as well. Thus, prior to re-weighting, the treatment and control groups had different distributions on several covariates that would be correlated with SHG membership. The lower panel of Table 1 shows that entropy balancing achieves the desired balance in the three moments of each of the covariates.

We estimate a logistic regression, clustering standard errors at the village level:

$$P(Y_i = 1) = \beta_0 + \beta_1 * shgmem_i + \epsilon_i \tag{3}$$

where Y_i defines the outcome variable, and $shgmem$ takes the value 1 if the woman is an SHG member; 0 otherwise. The survey questions used as outcome variables were categorical and were not originally coded in a binary format. We re-coded responses in a binary 0-1 format, by clubbing responses.[8] Thus, $P(Y_i = 1)$ is the probability that the outcome occurs. The estimation of this equation yields odds ratios; we estimate the marginal effects of SHG membership, presented in Section 4.

The outcome variables are of two kinds. One set relates to economic outcomes, where we compare individual members to non-member women (as well as indicators for their respective households); and in the case of livelihoods directly using SHG funding, we compare, within members, longer and shorter duration members.

The other set of outcomes consists of a broader set indicators that are ingredients of social capital. These relate to participation and knowledge about administration;

[7] See Footnote 3.

[8] Details available from authors upon request.

financial literacy and autonomy; mobility and decision-making; personal efficacy; access to information and entertainment; and collective action. We prefer evaluating each individual indicator separately, instead of creating an index.

For each of the outcome variables, we have both sets of estimates, EB and PSM, and we find that our results are robust to methodology. Our preferred results are from the EB estimation for reasons explained above.[9]

4 Results: Impact of SHG membership on Economic Outcomes and Social Capital

4.1 Economic Outcomes

4.1.1 Livelihoods

The direct impact of SHG membership on livelihoods can be examined only for members. Comparing individual members to non-members will not determine the impact of SHG membership because non-members might be economically active as well, and economic activity of members might be unrelated to their membership. Therefore, we focus on members and compare duration of membership in months as the treatment, distinguishing between shorter duration members (below the median of 33 months) and longer duration members (above the median).

We asked member women the following question: "did anyone in your family start an income generating activity through SHG financing?" Only 117 women, i.e. 4.5 percent of members answer this question in the affirmative. Over 95 percent of members, at the time they were interviewed, had not started any income generating activity. Thus, the overwhelming impact of SHG membership on livelihoods at the time of the survey was virtually non-existent. However, it is possible that this might have changed with time. Indeed, using "duration" as the treatment, we found that of those who said yes to the previous question, balancing the two groups of members using EB, 2.79 percent of short duration members report starting income generating activities using SHG financing, compared to 5.56 percent of long duration members.

4.1.2 Other Economic Outcomes

The impact of SHG membership on broader economic outcomes is examined by comparing the household level outcomes of SHG members and non-members after balancing them on

[9]We have reported one PSM result in Appendix A.1, which readers can match to its EB counterpart. The entire set of PSM results are available with the authors upon request.

covariates.

First, we compare household per capita consumption expenditure (*hhpce*). Comparing members to non-members after entropy balancing, we find no significant differences between the two groups. We also examined average wages, monthly household income and monthly profit of households of members and nonmembers, separately for *kharif* (monsoon) and *rabi* (winter) cropping seasons. The differences between members and non-members are either insignificant or perversely, in some cases, marginally lower for members. Overall, these results are insignificant. This result resonates with Deininger and Liu (2009), who in another context (the southern state of Andhra Pradesh) found significant gains in consumption for participants in new groups, which was not matched by a commensurate increase in income or assets.[10]

We surveyed the households on a whole range of production and consumption assets. Table A.1 displays the average ownership of each asset for members and non-members. For the regressions, we balanced members and non-members using EB on the covariates listed in Section 3.4. The marginal effects of membership (estimated separately for each asset) reveal that for a large number of assets, the likelihood of ownership is no different between members and non-members. While we found positive effects for six to seven assets, we also found negative effects for some others. Therefore, overall, our conclusion is that membership did not make a significant difference to the probability of asset ownership, conditional on covariates. We repeated this whole exercise adding *hhpce* as an additional control (based on the fact that SHG membership did not have a significant impact on *hhpce*), and the results remained the same.

There were two outcomes for which we find unambiguously positive effects. One, getting a loan from an NGO or SHG. This is entirely to be expected as the first set of primary activities of the SHG are small, regular savings within the group, where the group members deposit a certain amount each week, and small loans are given to group members from this kitty of resources.

In order to check for the fact that members and non-members are not fundamentally different in terms of their borrowing behaviour, we ask them about loans from four sources: (1) friends/neighbours/relatives; (2) shopkeepers/moneylenders; (3) SHG/NGO; and (4) banks/co-operatives/public/private company. We expect SHG membership to make a difference to (3) and (4) because longer duration SHGs graduate to establishing an SHG-bank linkage, and assist members in getting bigger institutional loans.

Indeed, we find that (Appendix Table A.2) members are 15.68 percentage points more likely than non-members to get these loans (3). Members are 4.55 percentage points

[10]The detailed regression results are in an online appendix: exact URL for Supplementary Material.

more likely to get loans from banks (4). We should also note that members are roughly 3 percentage points more likely to take loans from friends etc (1).

The second positive effect is on the probability of getting a job card, which entitles the holder to a National Rural Employment Guarantee Act (NREGA) job. NREGA is rural employment guarantee scheme, under the Ministry of Rural Development, which in principle guarantees upto 100 days of wage employment per family at minimum wage in rural India. While in principle this is a demand-driven programme, and is meant to be an entitlement, in reality, local officials exercise discretion in the allocation of job cards, and those with networks, contacts and influence are more likely to obtain job cards. We find that households of members are 13.6 percentage points more likely to possess a job card (Bottom panel of Table A.2). While this is an economic outcome, getting NREGA jobs cards is not the primary focus of the SHG programme. As we demonstrate below, this difference would in fact be explained by the greater social capital of member women, relative to non-member women.

Overall, the evidence on the impact of SHG membership on livelihoods and other economic outcomes (other than the most obvious one, i.e. loans) is mixed and weak. The strong NREGA result reflects our precise mechanism, *viz.* formation of weak ties promoting social capital, which enables members and their household members to access these jobs.

4.2 Social Capital

Turning to the social capital indicators, we can broadly divide them into two categories: one, the immediate or proximate effects, and two, the derived or secondary effects. We find strong effects of SHG membership on several indicators in both categories. The former are not surprising or unexpected, as these are outcomes directly related to the functioning of the SHGs. The latter set of effects are more powerful because these cannot be presumed. These are not related to SHG activities in a straightforward way, but reflect the creation of social capital through weak ties.

Tables 2, 3 and 4 summarize the weighted means (proportions) for members and non-members, with the marginal effect in Column 3. The marginal effects are the average change in the probability of outcomes for members relative to non-members. Each subset of these results is also presented graphically in the Figures section. As a robustness check, we also estimate each outcomes using the "duration" treatment (comparing short and long duration members). [11]

[11] These results are in an online appendix. In the majority of outcomes, the point estimates for longer duration members are higher than short duration members. Confidence intervals often overlap for this treatment, as we would expect based on smaller sample sizes, but the sign of the effect is in the expected direction.

4.2.1 Proximate Effects of SHG Membership

SHGs routinely discuss issues related to interactions with local administrative bodies, such as Integrated Childcare and Development Services (ICDS) or Anganwadi workers.[12] In the meetings, SHG members also discuss participation in larger political bodies, such as village general body meetings (Gram Sabhas).[13] Therefore, we would expect positive effects on political participation and knowledge about administrative positions.

Indeed, we do find that members are more likely to attend Gram Sabha (GS) and Mahila Sabha meetings[14] by 12 and 17 percentage points respectively, relative to non-members. Members are also more likely to know the names of the Prime Minister, and of the Chief Minister of their state (Maharashtra), where the differences are significant but smaller. These political leaders are far removed from the women's daily lives. (Table 2 and Figure 2(a)). Regarding names of local administrative workers, who are they encounter regularly in their daily lives, we find that the base proportions are high. Thus, 62 and 84 percent non-members know the names of the ASHA[15] and Anganwadi workers respectively. Despite despite the high base recognition (among non-members), membership increases this recognition by 7.5 and 5.2 percent respectively. The relatively low recognition of the particular positions of *Sangathika* merely reflects the fact that this position exists only in few specified locations in Maharashtra, it is not common across the entire state. All these differences are significant at the 1% level.

This particular impact is strong enough that it shows up in household level differences. Other members of the SHG member's household members are 12.5 percentage points more likely to attend GS meetings. We asked if any member of the household was ever a member of the Gram Panchayat (village council). Households with SHG members were 1.61 percentage points more likely to have had someone as a member of the GP. We should note that we can rule out reverse causality here, i.e. this could not be due to members coming from more politically active households, because members and non-members are matched on household characteristics, and we do not find significant household differences in the

[12]Anganwadis are rural child care services, as a part of the Integrated Child Development Services, under the Ministry of Women and Child Development. These were started in 1975 to combat childhood disease and malnutrition.

[13]The Gram (village) Sabha (assembly), or the general body of all residents of the village above 18 years, is a permanent body created by Article 243(b) of the Constitution of India. It is the primary body, or the fulcrum, of the apparatus of local governance.

[14]Since the participation of women in Gram Sabha meetings is not optimal, there is provision for separate female assemblies for female voters, which are known as Mahila (female) Sabhas.

[15]ASHA means hope, and is an acronym for Accredited Social Health Activist. Asha workers are community health workers under the Ministry of Health and Family Welfare recruited as a part of the National Rural Health Mission since 2005.

livelihood indicators.[16]

Since the primary purpose of the SHGs is to foster livelihood activities, we would expect to see clear impacts in indicators related to financial literacy and financial autonomy (Table 2 and Figure 2(b)). The first point to note is that for a sample drawn from the ten poorest districts, key elements of financial literacy are already at a high level. Members are 18 percentage points more likely to know where the nearest bank is, which is a substantial impact on a large base (65 percent non-members know where the bank is). Again, 80 percent non-members know the name of the bank, and membership increases this probability by 4.7 percentage points. Members are 28 percentage points more likely to go to the bank, and 24.5 percentage points more likely to have a savings account in their name. They are 11.3 percentage points more likely to have a fixed deposit in their names. Our estimates reveal that members are 4 percentage points more likely to have a passbook, but this variable had a large number of missing values (only 3213 women answered this question). These effect sizes on an already large base value are substantial, based on arguments in Section 3, are unlikely to reflect omitted variables or selection bias.

4.2.2 Secondary Effects of SHG Membership

a) Mobility, Information and Entertainment

We find positive impacts of SHG membership on a range of outcomes, which are not directly related to SHG membership, especially in a context such as ours, where SHGs have not had significant livelihood impacts. Thus, on indicators related to "Mobility, Information and Entertainment", we find that members are more likely to travel alone (Table 3 and Figure 3), be better informed about elections, be better informed about day-to-day events, are more likely to watch series on television. The marginal effect of SHG membership on keeping jewellery in their possession (i.e. have control over their own jewellery), and getting information on television series is small in magnitude, but note that the base level for most indicators is high, i.e. more than half non-members report "yes" to these questions. However, base level spans a range from 93 percent (non-members keep jewellery) to 52.9 percent (non-members travel alone).

Notice that the base level for land ownership and personal mobile use is very low – at 4.2 and 9.8 percent respectively. SHG membership does make a small positive difference (1.9 and 4.4 percentage points respectively), but the low levels point to the larger issue of low levels of asset ownership by women, which SHG membership is not able to reverse.

[16]The household-level results, including those discussed in Section 4.3.3 are in an online Supplementary Materials appendix.

b) Decision-Making

An important secondary effect of SHG membership, considered of paramount importance in the empowerment literature, is the involvement of women in decision making. We asked women "do you provide ANY opinion or input into these decisions?": Purchase of durables; purchase of personal items (sari, bangles); Borrowing (whether to take a loan, where from); Work (who should do which type of work, where); Own labor (whether/where to work); Migration (either of primary income earner or entire household); Politics (who to vote for); Education of children (which school, upto which class, spending on books); and Healthcare (which facility to go to, who should accompany the patient).

Our results (Table 3 and Figure 4) show that, on all these indicators, SHG membership has very strong positive effects. The magnitudes are small (rough average 4 percentage points, with the exception of personal items), but note that this is on a high base, ranging from an average of 97.4 percent for personal items to 68.7 percent for borrowing for non-members. There is a great deal of regional variation in the agency of Indian women in everyday decision-making, with low levels in north India. The figures from our survey reveal relatively high levels of agency and say across the range of questions.

4.3 Vignettes

A unique feature of our paper is the inclusion of vignette questions in a large-scale survey format. These results are presented below.

4.3.1 Collective Action Vignettes

We presented women with four vignettes in order to test their propensity for collective action in matters closely related to their everyday lives.

1. The control shop (Public Distribution System (PDS) shop[17]) has been closed for a month. Even when it is open, ration is of bad quality. People have to spend more to buy food at market prices.

2. A man in your *tola* (hamlet) beats his wife. Last week, his wife was so badly beaten that she was admitted to hospital.

3. Men in the village waste money on liquor and get sick due to drinking. Outsiders come to the village for liquor and make the village unsafe for women.

[17]This is a scheme for subsidised foodgrain and other essential rations like oil, primarily for households below the poverty line.

4. The village school received a grant from the government for infrastructure development two years ago, but the construction work has not yet started. The classes happen in the open areas. During the rains, the classes get disrupted. The safety of the girls is also compromised due to lack of toilet facilities.

We coded the response as zero if women say "it is not my problem" or "I can do nothing even though I am affected", or "Don't know what to do" and as one if women say "ask community members to intervene" or "gather community members and intervene together" or "intervene myself".

Table 4 and Figure 5 indicate that between 46 and 55 percent nonmembers show a propensity for collective action, and SHG membership increases this propensity in two of the four cases. On domestic abuse and the school infrastructure problem, SHG members are no more likely than nonmembers to participate in collective action. This points towards the fact that some problems are so deeply entrenched and/or considered difficult to scale that SHG membership is not sufficient for women to feel that they could shift the needle on these issues.

We see this clearly in women's aspirations for their children. We asked women if they would like their daughter to work after marriage, and whether they would like their son and daughter to study "as much as they want". These women have experienced a great deal of adversity and probably realise their own participation in SHGs does not sufficiently guarantee that their children can have a substantially different life than their own. The response rate to this question is much lower because this question was asked to those women who had an unmarried daughter under 18 years (Table 4 and Figure 7). Other than a slightly significant (at 10%) difference regarding attitudes towards son's education, there is no difference between members and non-members regarding aspirations for their children.

4.3.2 Personal Efficacy

In order to gauge personal efficacy, we presented the respondents with one vignette:

"In a village that we visited, there was no bore-well. The drinking water source was so far that women had to walk for 20 minutes to get to the source, and another 20 minutes to walk back. Some of the women we talked to mentioned that this was a hard task, especially in summer. They were talking about approaching someone to build a bore-well." We followed this up with this question: "Let us assume that this work will be carried out, and you are one of the people nominated by the panchayat to check its progress and quality. Will you accept such a responsibility?"

We find that SHG members are 5.3 percentage points more likely to accept responsibility for checking on building the water source (bore-well). (Table 4 and Figure 6)

We followed this up with three questions about women's ability to participate in decision making related to their everyday life.

1. "Common village women do not have the ability to participate in public decisions, such as Gram Sabha decisions that affect an ordinary village's life."

2. "Administrative decision making, e.g. decision to construct roads in the village, or distribution of PDS cards, or National Rural Employment Guarantee Act (NREGA) payments, seems so complicated that ordinary village women cannot really understand the reasons behind such decisions."

3. "Things are run by a few people. Ordinary citizens cannot do much about it."

On these three questions, SHG members are less likely to agree with these statements relative to non-members (by roughly 3.6 percentage points). This is consistent with the mechanism of enhanced social capital, which makes them more confident of their abilities to intervene in public decision making.

4.3.3 Institutional Access for Household Members

Does the enhanced social capital of the women spill-over to other members of their household? In other words, does the social capital of the women translate into greater institutional access for their family members? We tested for this by asking the following question to the head of household:

"I will now read out some situations that are faced by Maharashtra's villagers. For every statement, please indicate how easy or difficult it would be for you to deal with such situations, if you ever face them." We gave them five situations: have a sick family member attended to in a government hospital; obtain a certificate from the government office; deal with some trouble with the police; get a child admitted to a high school or college; obtain a loan from the bank. We then asked them how easy or hard it would be for a person like themselves to deal with this, and got their answers on a Likert scale of four (very easy, somewhat easy, somewhat difficult and very difficult). We deliberately removed the middle option to eliminate the central tendency bias, and clubbed the four options into a binary variable (easy and difficult).

In contrast to the results in Section 4.2.1 on GP membership, we found no significant differences between families of members and non-members. Thus, in our study area, SHG membership did push the needle in terms of personal efficacy and collective action for

women members, but it did not automatically translate into greater institutional access for other members of their household. It is entirely possible that this might be a medium-term impact and/or context specific, but we don't observe it in our data.

4.4 Is the Impact Higher for Disadvantaged Groups?

Figure 8 shows the results for collective action and personal efficacy vignettes separately for the broad caste groups. Interestingly, in the collective action vignettes, whereas for the sample as a whole, we did not observe significant differences between members and non-members on the domestic abuse and school infrastructure problem, we see that SC-ST members (i.e. members from the most disadvantaged caste groups) show a significantly higher propensity for collective action in all the four vignettes compared to non-members. This is not the case for upper caste (GEN) women.

The personal efficacy results are broadly similar in direction. For all the four questions, SC-ST members are more likely than their nonmember counterparts to have a positive outcome. While for the collective action vignettes (Panel a), the point estimates for SC-ST members are higher than those for other caste groups, in the personal efficacy vignettes (Panel b), that is not necessarily the case.

These groups are at the bottom of the socio-economic hierarchy, especially so in rural India (Mosse, 2018; Deshpande and Ramachandran, 2019), subjected to deep stigmatisation, marginalisation and discrimination. Thus, the fact that SHG membership translates into greater personal efficacy and stronger propensity to collective action for these women, compared to women higher in the caste hierarchy, indicates that being a part of this savings group imparts greater agency to those whose voices are either less heard or actively silenced. In the context of tenaciousness of caste hierarchies, this is a very important outcome of the programme, even if it was not originally intended as a major outcome.

5 Discussion

Our findings on enhanced social capital, contributing to strengthening of women's empowerment, is supported by other evidence, even when it is not articulated as such. For instance Dutta et al. (2017), based on a study of micro-finance groups in two districts of West Bengal in India, find that membership has a positive impact on social insurance and women's decision making power. They gauge social insurance by asking women how much they think they can raise in an emergency by borrowing from others. The fact that members report higher amount (when matched with similar non-members) indicates that the channel we outline, *viz.*, creation or enhancement of social capital, is at work. Mukherjee and Kundu

(2012), another study in West Bengal, also find similar positive impacts on decision-making.

Our findings on increased political participation strongly resonates with findings of Palaniswamy et al. (2019) who, in the context of the southern state of Tamil Nadu demonstrate a significant improvement in women's participation in gram sabha meetings by doubling their attendance. They also find increased social capital and women's sense of political efficacy and identity. However, as their findings show, this is only the first step. They find no evidence that improved participation led to improved agenda setting power of women, nor that it led to a greater probability of eliciting a response from government officials.

It is possible that the programme generates positive externalities, but does not significantly alter women's socio-economic status, at least in the short or medium term. Based on data from a 2004 survey in the state of Andhra Pradesh where the programme has a much longer history, Deininger and Liu (2009) find that social capital and economic empowerment increased equally for participants and non-participants in programme areas, consistent with the notion that the programme generated positive externalities. Desai and Joshi (2013) established SHGs in randomly chosen villages in one of the poorest districts in western India. Two years of exposure to these programmes increased women's participation in group savings and civic activities. They find an increase in women's participation in household decision making, but no significant increase in incomes or on women's socio-economic status.

While most studies find an improvement in some aspects of members' empowerment indicators, there is no consensus in the literature that examines the impact of SHGs on women's empowerment. Indeed, Kabeer (2001), in her review of impact studies of Bangladesh micro finance interventions, finds that different studies do not necessarily use the same concept of empowerment, neither do they measure it the same way. Among studies on India, whereas Garikipati (2008) finds instances of diversified livelihoods and reduced vulnerability to shock, a randomised controlled trial (RCT) by Banerjee et al. (2015) finds mixed economic results: an increase in small business investment, profits of pre-existing businesses and durable goods expenditure, but no increase in consumption.

While both studies find some positive economic effects, they find no change in 'empowerment'. This could be because of definitions, i.e. how exactly empowerment is defined. Banerjee et al. (2015) use an equally weighted average of z-scores of 16 social outcomes as an index of empowerment. These outcomes include various decision making indicators, levels of expenditure on various items, plus counts of female children less than one year and between 1-2 years; the latter indicating the absence of strong son preference or greater female agency to prevent infanticide or gross neglect.[18] Garikipati (2008) finds that loans

[18]This is similar to Desai and Tarozzi (2011)'s evidence, based on a field experiment in Ethiopia, which shows that microcredit programs have no effect on women's contraceptive use.

(taken through SHGs) get diverted for household use and women fail to become co-owners of family's productive assets, both of which do not increase women's empowerment.

Both these studies use indicators that are not easy to shift, as they reflect the operation of deep-rooted patriarchal norms. It is unrealistic to expect that participation in a livelihoods programme would lead to an erosion or weakening of these norms. Indeed, our overall positive results notwithstanding, we too find that the more deeply entrenched the issue (e.g. domestic abuse), the harder it is for SHG membership (alone) to make a dent in it. We should also note that increasing autonomy might have unintended negative consequences. de Hoop et al. (2014) find that SHG membership increases autonomy, but not necessarily subjective well-being. In fact, they find that members living in communities with relatively conservative gender norms among non-members have lower subjective well-being. They interpret this as a manifestation of a phenomenon that has been noted in other contexts: increasing autonomy implying a stronger violation of established gender norms.

Holvoet (2005) examines the relationship between credit and decision-making agency within the household, where she makes an allowance for what she terms "non-decision making" (i.e. men and women simply following social norms). As she argues, the latter are a powerful mechanism to "enforce and fortify existing 'gendered' behaviour."(p. 78). Her study of selected programmes in South India finds that direct loans to women by banks (as opposed to men) increase their stake in matters directly related to loan use, but women are not able to translate this say into other domains of decision-making. However, when loans are channelled through women's groups and "combined with more investment in social intermediation" (p. 97), there is clear shift from norm-following and male decision-making to more bargaining and sole female decision-making. Her interviews suggest that "social group intermediation had further gradually transformed groups into actors of local institutional change. As such they were increasingly involved in extra-household bargaining with the community, thereby strengthening their individual fall-back position within the household" (p. 97). This provides support to our argument that SHGs lead to the augmentation of social capital, which in turn, strengthens the process of female empowerment.

6 Concluding Comments

Based on data from a large-scale primary survey conducted in 2015 in the ten poorest district of rural Maharashtra in India, our results indicate that weak economic ties, via SHG membership, can create social capital. Our study does not suffer from low power and statistical precision that the small-scale experimental studies in the literature suffer from. We find that the creation of social capital can be seen through an improvement in a variety of individual indicators that increase personal efficacy, through an increased propensity for collective action. Our data show that this creation and enhancement of social capital is not

being achieved through improved livelihoods, but because of the formation of weak ties. We believe this increase in social capital will contribute to the ongoing process of women's empowerment.

We should emphasise that we are not arguing that livelihood programmes are doomed to failure in terms of their economic impact. Indeed, there is ample evidence of the success of livelihood programmes; our own results demonstrate positive impacts in some dimensions. Our results are qualitatively similar to the results of other studies, e.g. Datta (2015), which for the state of Bihar finds that SHG membership increases ownership of some assets (cows and mobile phones in their case, compared to goats and sewing machines in our case), and a slight substitution towards animal husbandry as a livelihood activity.

Pandey et al. (2019), based on a primary survey in three states of India, find that livelihoods in treatment areas have diversified, and the biggest reason for this diversification is the large and significant increase in the number of self-employment livelihood activities. They point out that most of this increase is due to households moving away from casual farm labour towards self employment. They also find an increase in work participation rates (WPR) of women, contrary to the trends observed for India as whole, which has witnessed a significant reduction in WPR. However, we need to quantify the net change in livelihood options, and consequently income, as one source of livelihood might be substituted by another. The importance of calculating the net change is highlighted by studies in other contexts, such as Crepon et al. (2015) for Morocco, which find that an increase in investment assets used for self-employment was matched by a reduction in income from casual labour, resulting in no overall gains in income or consumption.

We would like to suggest that whether or not there are significant livelihood impacts, and in which exact dimensions, is a function of specific features and might vary across contexts. Our argument is that, regardless of the economic impacts, the mere fact of women organising in SHGs, viz., creation of economic ties, leads to the creation of social capital, which in turn has a positive impact on several empowerment indicators. This sequence or pathway is not fundamentally dependent on the livelihoods impact. While these programmes continue to improve and evolve in terms of their livelihoods focus, the creation and augmentation of social capital is a significant outcome, in and of itself, that can contribute to women's empowerment and gender equality.

Stepping back and outside the boundaries of this paper for a moment, we note that the ultimate aim of rural livelihood programmes, especially in their second phase currently underway, is to go beyond creating livelihoods to eliminate rural poverty. The idea is to aim for rural transformation led by SHG member women. Thus, the expectation seems to be that women, in addition to battling various constraints and obstacles imposed by patriarchal social structures, now also have to bear the burden of eliminating poverty

and transforming rural society through a whole gamut of activities ranging from organic farming, to banking to entrepreneurship to horticulture to water and soil conservation, to name a few of the intended activities. This instrumental interest in women as a means to achieve broad development objectives, which should be the focus of most socio-economic policies, could arguably undermine the larger objective of gender equality. Additionally, there is a broader critique of community-based and driven development projects (Mansuri and Rao, 2004) which argues that these programmes are susceptible to elite capture, and their impacts are strongly influenced by local inequality. Thus, we need to be mindful of local contexts which would shape the mechanisms driving the impacts.

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Tables

Table 1: Balance table for first three moments using Entropy Balancing

Panel A: Before Weighting

	Treatment Units:2083			**Control Units:7065**				
	Mean (1)	**Var (2)**	**Skewness (3)**	**Mean (4)**	**Var (5)**	**Skewness (6)**	**Diff of Means (7) = (1) - (2)**	
Household Head	0.069	0.064	3.412	0.054	0.051	3.950	0.015	**
Years of Education	4.964	18.010	0.163	4.336	19.570	0.484	0.628	***
Married	0.924	0.071	-3.191	0.938	0.058	-3.643	-0.015	**
SC	0.179	0.147	1.678	0.135	0.117	2.138	0.044	***
ST	0.221	0.172	1.346	0.244	0.185	1.192	-0.023	**
OBC	0.342	0.225	0.665	0.305	0.212	0.846	0.037	***
Nomadic	0.127	0.111	2.237	0.155	0.131	1.902	-0.028	***
General	0.131	0.114	2.187	0.161	0.135	1.850	-0.029	***
Age	39.4	109.9	0.589	39.0	158.1	0.603	0.420	
Household Size	5.137	4.250	1.532	5.114	4.915	1.581	0.023	
Agricultural Land	0.540	0.249	-0.161	0.534	0.249	-0.137	0.006	
Highest Ed for Male	9.622	13.830	-0.647	8.907	17.400	-0.571	0.715	***
SC-ST Proportion	0.322	0.087	1.261	0.325	0.099	1.169	-0.003	
Census Num of HH	604.4	527720.0	3.318	665.9	492367.0	2.774	-61.5	***
Census Sex Ratio	103.3	88.3	1.624	103.4	87.9	0.153	-0.100	
Gender of Leader	0.604	0.239	-0.425	0.607	0.239	-0.439	-0.003	
Leader Same Caste	0.424	0.244	0.306	0.421	0.244	0.321	0.004	

*Notes: *** is significant at 1%, ** at 5% and * at 10%*

Panel B: After Weighting

	Treatment Units:2083			**Control Units:7065**		
	Mean (1)	**Var (2)**	**Skewness (3)**	**Mean (4)**	**Var (5)**	**Skewness (6)**
Household Head	0.069	0.064	3.412	0.069	0.064	3.411
Years of Education	4.964	18.010	0.163	4.963	18.010	0.163
Married	0.924	0.071	-3.191	0.924	0.071	-3.190
SC	0.179	0.147	1.678	0.179	0.147	1.678
ST	0.221	0.172	1.346	0.221	0.172	1.345
OBC	0.342	0.225	0.665	0.342	0.225	0.664
Nomadic	0.127	0.111	2.237	0.127	0.111	2.237
General	0.131	0.114	2.187	0.131	0.114	2.186
Age	39.4	109.9	0.589	39.4	109.9	0.589
Household Size	5.137	4.250	1.532	5.137	4.250	1.532
Agricultural Land	0.540	0.249	-0.161	0.540	0.248	-0.161
Highest Ed for Male	9.622	13.830	-0.647	9.621	13.830	-0.647
SC-ST Proportion	0.322	0.087	1.261	0.322	0.087	1.261
Census Num of HH	604.4	527720.0	3.318	604.4	527698.0	3.318
Census Sex Ratio	103.3	88.3	1.624	103.3	88.3	1.624
Gender of Leader	0.604	0.239	-0.425	0.604	0.239	-0.425
Leader Same Caste	0.424	0.244	0.306	0.424	0.244	0.306

Table 2: Outcome means (proportions) for Non-Members and Members with corresponding marginal effects: Proximate Effects

	Weighted Proportions		Diff (Marginal Effect)		N
	Non- Members (1)	Members (2)	(3) = (2)-(1)		(4)
Political Participation and Knowledge about administration					
Gram Sabha	0.116	0.239	0.123	***	9120
Mahila Sabha	0.103	0.275	0.172	***	9108
PM Name	0.439	0.503	0.064	***	9148
CM Name	0.253	0.291	0.038	***	9148
Asha Worker	0.617	0.693	0.075	***	9130
Anganwadi Worker	0.843	0.895	0.052	***	9118
Sangathika	0.261	0.412	0.151	***	9138
Gram Sevak	0.430	0.504	0.074	***	9144
Panch Rozgar	0.358	0.402	0.044	***	9135
Financial Literacy and Autonomy					
Where Bank	0.649	0.832	0.183	***	9100
Name Bank	0.802	0.850	0.047	***	6053
Go Bank	0.352	0.635	0.283	***	9089
Savings Account	0.335	0.579	0.245	***	9120
Passbook	0.796	0.837	0.042	**	3213
Fixed Deposit	0.150	0.263	0.113	***	9122

*Notes: *** is significant at 1%, ** at 5% and * at 10%*

Table 3: Outcome means (proportions) for Non-Members and Members with corresponding marginal effects: Secondary Effects

	Weighted Proportions		Diff (Marginal Effect)		N
	Non- Members	Members			
	(1)	(2)	(3) = (2)-(1)		(4)
Mobility, Information and Entertainment					
Travel Alone	0.529	0.648	0.119	**	9145
Mobile	0.098	0.143	0.044	***	9142
Land in Name	0.042	0.061	0.019	***	9134
Keep Jewellery	0.932	0.946	0.014	*	6405
Info on Election	0.537	0.601	0.063	***	9148
Info on Day to Day	0.670	0.724	0.054	***	9017
Watch Series	0.441	0.519	0.078	***	9131
Info on Series	0.846	0.847	0.001	***	3961
Decision Making					
Durables	0.837	0.879	0.042	***	9141
Personal	0.974	0.982	0.008	**	9145
Migration	0.688	0.743	0.055	***	9133
Work	0.730	0.782	0.052	***	9137
Own Labor	0.848	0.888	0.040	***	9143
Borrowing	0.687	0.754	0.066	***	9143
Politics	0.805	0.837	0.032	***	9134
Child Education	0.809	0.861	0.052	***	9128
Healthcare	0.834	0.873	0.040	***	9142

*Notes: *** is significant at 1%, ** at 5% and * at 10%*

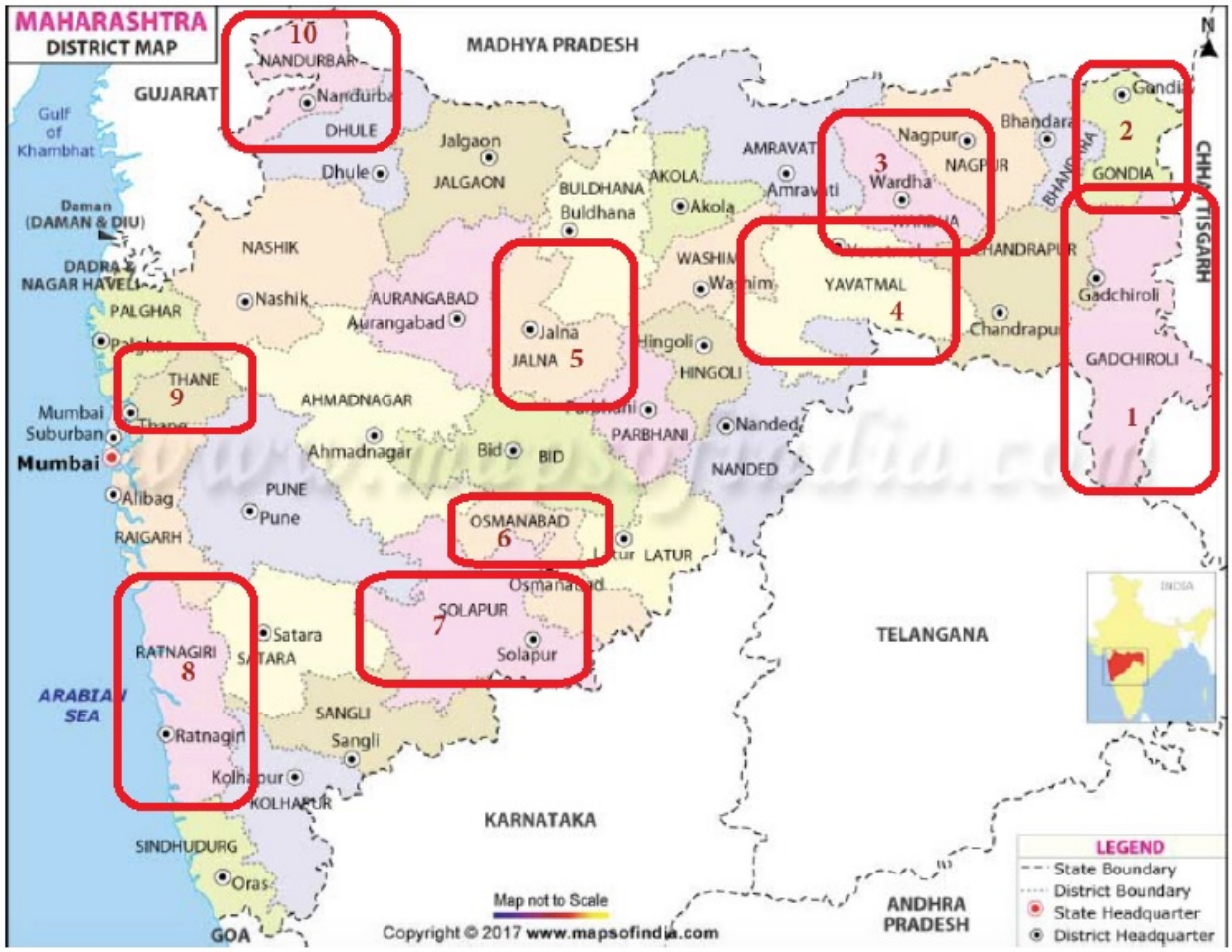
Table 4: Outcome means (proportions) for Non-Members and Members with corresponding marginal effects: Vignettes

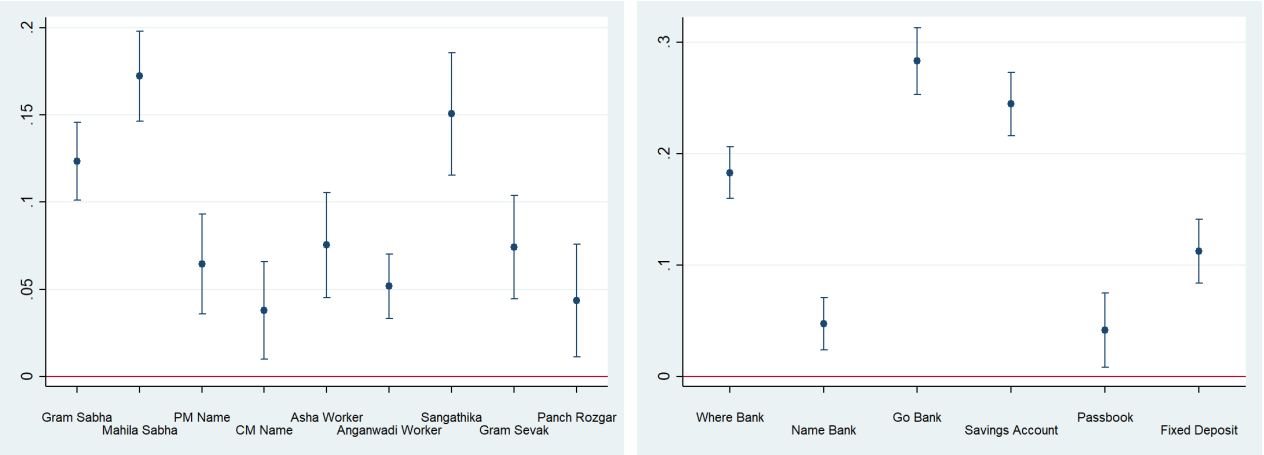
	Weighted Proportions		Diff (Marginal Effect)		N
	Non- Members	Members			
	(1)	(2)	(3) = (2)-(1)		(4)
Collective Action Vignettes					
Shop Problem	0.498	0.558	0.060	***	9148
Domestic Abuse	0.503	0.518	0.015		9148
Alocholism	0.462	0.500	0.038	**	9148
School Infra Prob	0.550	0.579	0.029		9148
Personal Efficacy					
Accept Resposibility for Dev Works	0.364	0.417	0.053	***	8916
Ability to Participate in Public Decisions	0.521	0.484	-0.037	**	8941
Admin Decisions Complex	0.526	0.489	-0.037	**	8944
Things Run by a Few	0.587	0.552	-0.036	**	8974
Aspirations for Children					
Work After Marriage	0.640	0.671	0.031		3460
Son Education	0.639	0.672	0.033	*	4445
Daughter Education	0.562	0.586	0.024		3757

*Notes: *** is significant at 1%, ** at 5% and * at 10%*

Figures

Figure 1: Selected Districts in Maharashtra





(a) Participation and Knowledge About Administration

(b) Financial Literacy & Autonomy

Figure 2: Knowledge and Autonomy: EB Results

Figure 3: Mobility, Information and Entertainment: EB

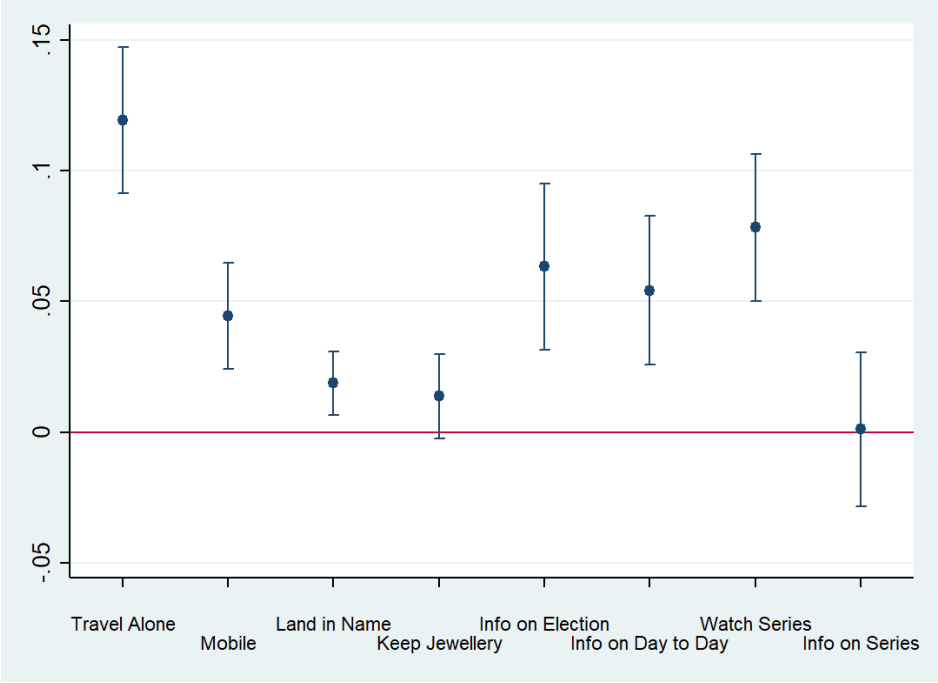


Figure 4: Decision-Making: EB

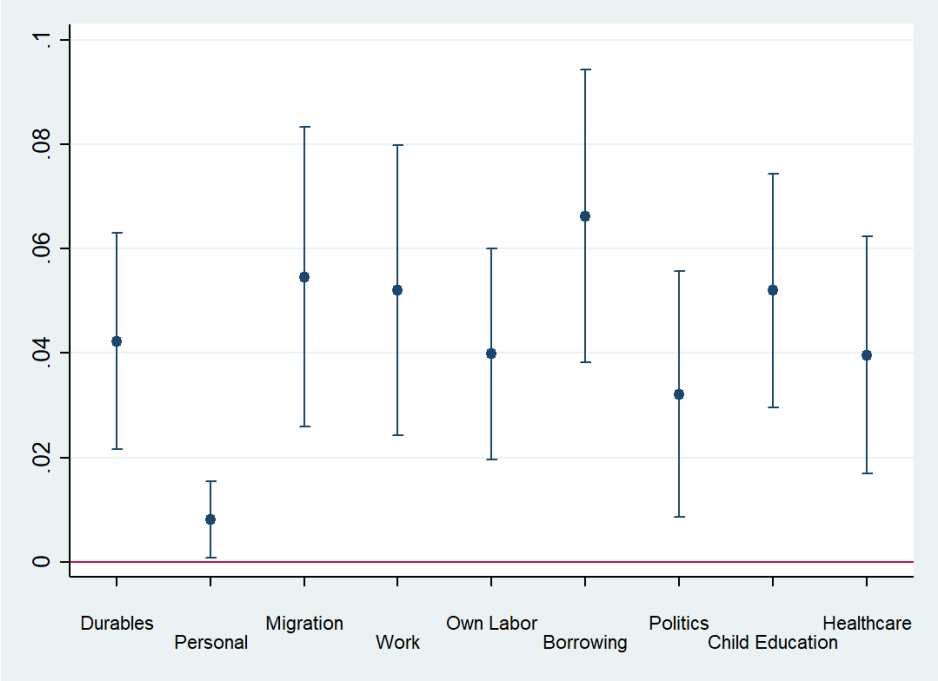


Figure 5: Collective Action Vignettes: EB

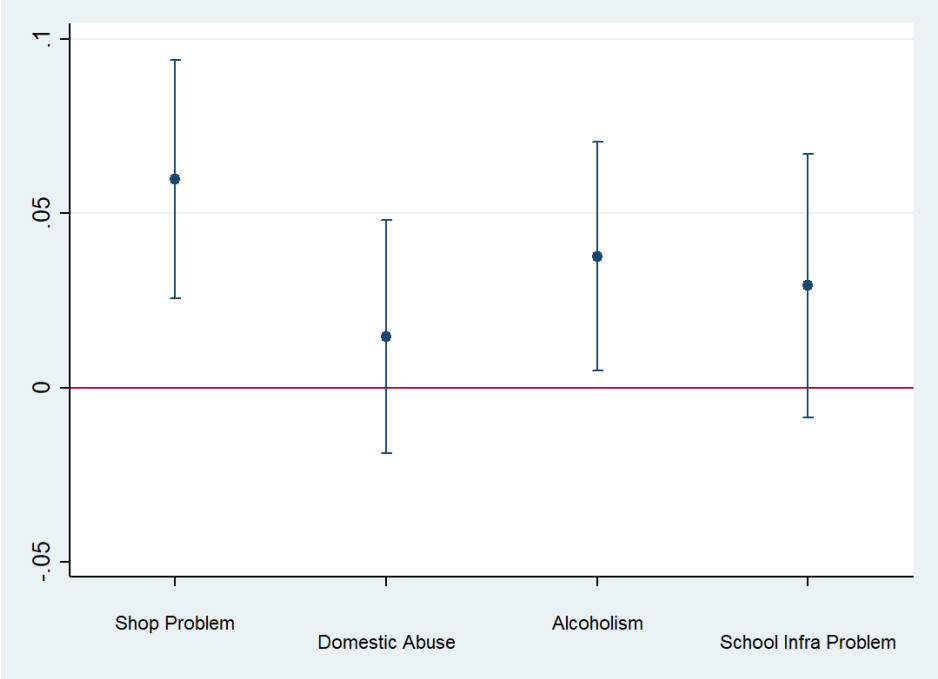


Figure 6: Personal Efficacy: EB

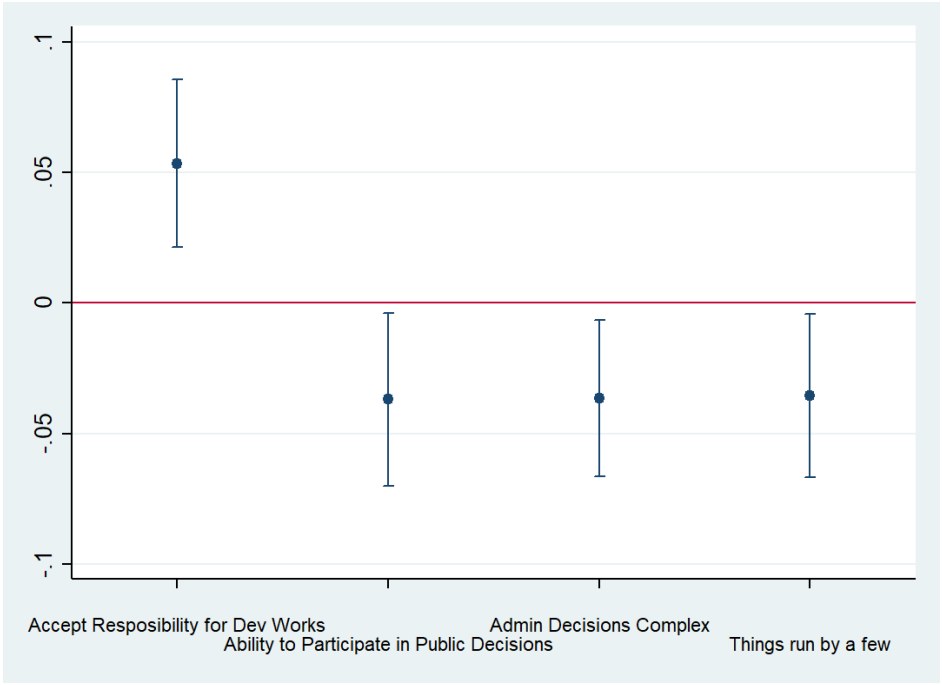
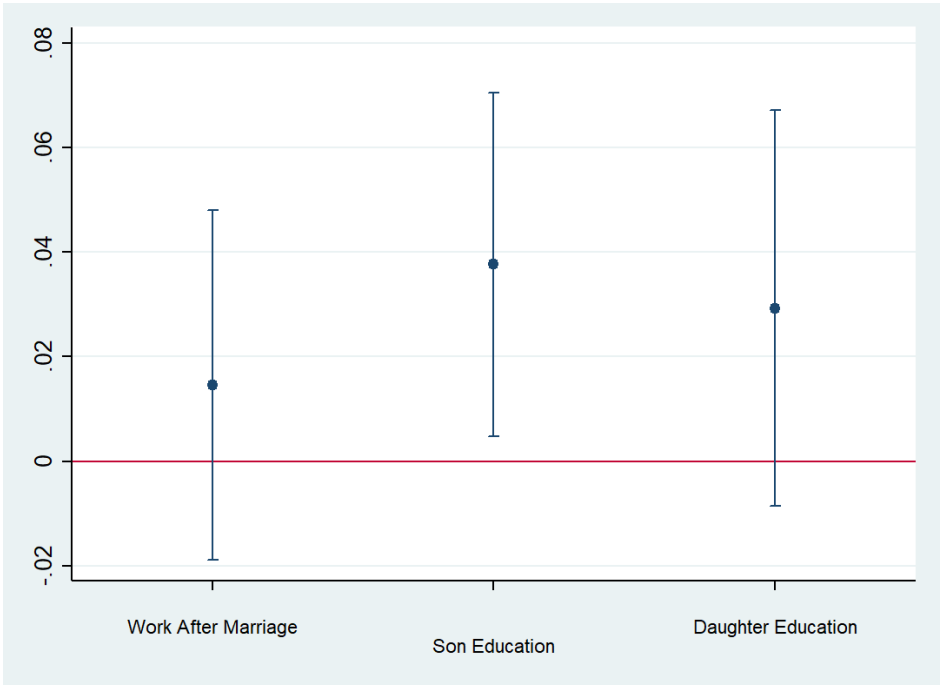
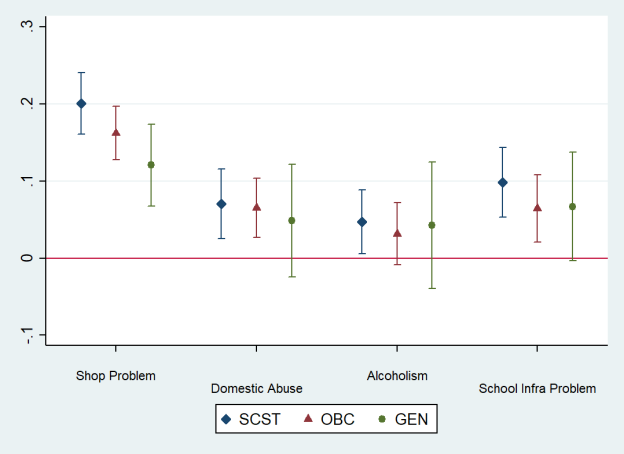
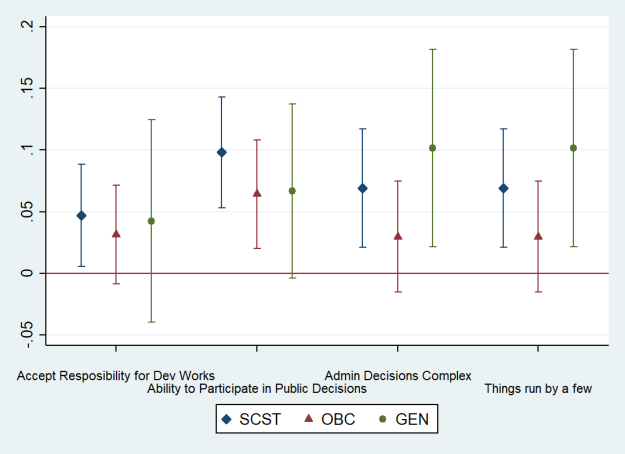


Figure 7: Aspirations for Children: EB





(a) Collective Action Vignettes



(b) Personal Efficacy: EB

Figure 8: Collective action and personal efficacy, by Broad caste groups

A Appendix

A.1 Propensity Score Matching

Figure A.1: Participation and Knowledge About Administration: PSM

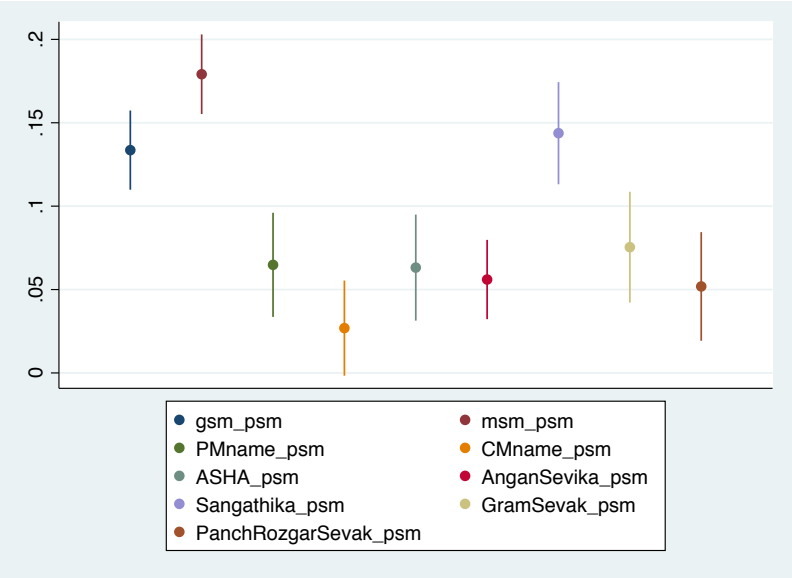


Table A.1: Asset Ownership Proportions for Non-Members and Members with corresponding marginal effects

	Weighted Proportions		Diff (Marginal Effect)		N
	Non- Members	Members			
	(1)	(2)	(3) = (2)-(1)		(4)
Production Assets					
Plough	0.231	0.230	-0.001		9156
Harrow	0.196	0.197	0.001		9154
Pump/motor-sets	0.113	0.095	-0.018	**	9155
Bullock carts	0.140	0.138	-0.002		9155
Tractor	0.018	0.013	-0.005		9155
Spray Pump	0.118	0.120	0.002		9156
Power Tiller	0.007	0.008	0.001		9156
Bore-well	0.042	0.035	-0.007		9156
Drip irrigation sprinkler	0.029	0.023	-0.006		9154
Hand Tools	0.856	0.860	0.005		9156
Cows	0.218	0.240	0.022		9153
Bulls	0.225	0.228	0.003		9154
Buffaloes	0.101	0.101	0.000		9155
Goats	0.130	0.165	0.035	***	9154
Sheep	0.006	0.003	-0.003	**	9155
Poultry	0.138	0.146	0.009		9155
Pigs	0.001	0.001	0.000		9155
Retail Shop	0.024	0.027	0.003		9153
Work Shop	0.007	0.012	0.006	**	9153
Consumption Assets					
Sewing machine	0.086	0.104	0.017	**	9154
Refrigerator	0.088	0.081	-0.007		9155
Almirah	0.400	0.402	0.002		9156
Kerosene stove	0.137	0.147	0.010		9155
Gas stove	0.181	0.204	0.023	*	9154
Bicycle	0.309	0.383	0.074	***	9154
Two-wheeler	0.210	0.211	0.001		9154
Car/jeep/mini-truck	0.019	0.021	0.002		9155
Telephone	0.023	0.015	-0.007	*	9154
Mobile phone	0.766	0.818	0.053	***	9155
Television	0.531	0.574	0.043	***	9156
VCR/ CD/DVD player	0.080	0.058	-0.022	***	9155
Electric fan	0.558	0.614	0.057	***	9156
Computer/laptop	0.013	0.008	-0.005	**	9153
Pressure cooker	0.189	0.226	0.037	***	9154
Cooler	0.117	0.130	0.013		9154
Radio	0.016	0.015	-0.001		9149

*Notes: *** is significant at 1%, ** at 5% and * at 10%*
Entropy Balancing is done on all household and village variables

Table A.2: Indebtedness and Job-Card Proportions for Non-Members and Members with corresponding marginal effects

	Weighted Proportions		Diff (Marginal Effect)		N
	Non- Members	Members			
	(1)	(2)	(3) = (2)-(1)		(4)
Loan Sources					
Friend,Neighbour,Relative	0.181	0.214	0.033	***	9148
Shopkeeper, Moneylender	0.079	0.091	0.013		9146
SHGs,Post Office,NGO	0.026	0.183	0.157	***	9149
Banks, Co-operatives, Companies	0.170	0.216	0.046	***	9144
NREGA Job Card					
NREGA Job Card	0.258	0.394	0.136	***	9107

*Notes: *** is significant at 1%, ** at 5% and * at 10%*
Entropy Balancing is done on all household and village variables

A.2 Maharashtra State Rural Livelihoods Mission (MSRLM)

The MSRLM was launched in 2011 as a registered organization under the aegis of the National Rural Livelihoods Mission (NRLM) of India, under the Ministry of Rural Development. This is one of the largest community driven development programs in the world. The goal of the MSRLM is to reduce rural poverty through a range of livelihoods interventions. In particular, the mission's objective is to generate pathways towards creating sustainable livelihoods by organizing poor women in SHGs, which in turn will help in reducing rural poverty. The conceptualization and design of the MSRLM goes beyond income generation activities and employment programs to include capacity building, financial inclusion, social mobilization and marketing services as equally important elements of livelihoods enhancement. The key task of the mission is to "build and strengthen institutions of the poor, putting in place dedicated support structures for such institutions and drawing upon their skills, knowledge and desire to overcome poverty".

As opposed to a uniform, state-specific model of mobilization of marginalized women into SHGs and higher institutions that is practiced by other projects under the NRLM mandate, MSRLM has leveraged the decades-long experience of the SHG movement in Maharashtra. Thus, there are four distinct mobilization strategies practiced by MSRLM. The Society for Elimination of Rural Poverty (SERP), Andhra Pradesh is supporting MSRLM in eight blocks of four districts, by rolling out the social mobilization and institution-building model under the "Resource Block" strategy. Additionally, the MSRLM has a partnership with pre-existing SHG schemes which they call "home-grown" models (HGM). Thus, MSRLM is supported by Mahila Arthik Vikas Mahamandal (MAVIM), which implements the ?Tejaswani? project that organizes village level federation, with the aim of strengthening institutions of the poor. Another home-grown model is pursued in two districts, where a rich pool of human and social capital, the "Sangathikas" (meaning organisers or mobilisers), is already developed under earlier government schemes. The Sangathikas are entrusted with the task of mobilizing the poor into new SHGs. MSRLM has also designated 17 blocks in nine districts as other intensive blocks, where MSRLM staff would incorporate best practices from the previous 3 models and carry out suitable mobilization. In addition, earlier SHGs formed under the SGSY[19] scheme have also been subsumed under the MSRLM.

When the MSRLM started operations, it identified 36 blocks based on criteria such as percentage of Scheduled Castes (SC) or Scheduled Tribes (ST), number of families below poverty line (BPL), number of SHGs formed in the block under various schemes and

[19]The Swarnjayanti Gram Swarozgar Yojana (SGSY) was launched as an integrated programme for self-employment of the rural poor with effect from 1 April 1999. The objective of the scheme was to bring the assisted poor families above the poverty line by organizing them into SHGs through the process of social mobilization, their training and capacity building and provision of income generating assets through a mix of bank credit and government subsidy. Since its inception, over 2.25 million SHGs have been established. The SGSY SHGs were subsumed by the NRLM.

better financial management track record/ better co-operation from banks, etc. In the first phase of its operations, MSRLM engaged poor and marginalized communities intensively in selected blocks within the aforementioned ten districts, with the intention that the remaining 23 districts in the state, as well as the remaining blocks in these ten 10 districts would be covered under a non-intensive intervention strategy in a phased manner in Phases 2 and 3.[20]

[20]http://www.umed.in/English/frmAboutMSRLM.aspx.

Online Appendix

Can Weak Ties Create Social Capital? Evidence from Self-Help Groups in Rural India

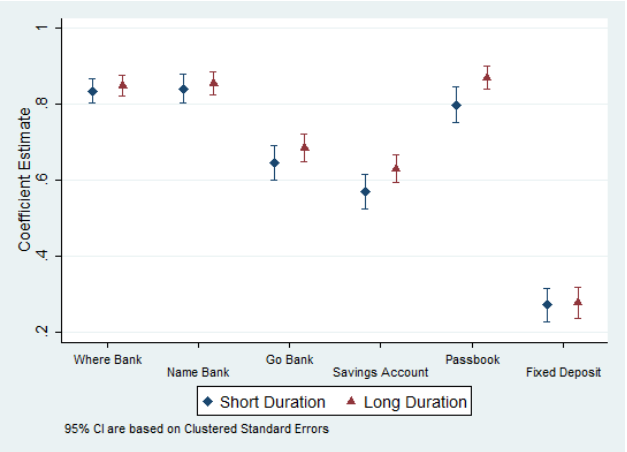
Ashwini Deshpande and Shantanu Khanna

January 28, 2020

1 Short Duration Vs. Long Duration Membership

In this section, we consider figures for all outcomes, with figure numbers corresponding exactly with the figures in the main paper. Instead of looking at members vs. non-members, the two groups under consideration are short duration members vs. long duration members. Members who have been part of SHGs below the median of 33 months are classified as short duration, and those who have been members for greater than 33 months are classified as long duration members. As in the main analysis, these two groups are weighted appropriately using the entropy balancing technique in order to achieve covariate balance along the first three moments. The list of covariates is the same as in the main analysis. Instead of plotting the marginal effects of the duration treatment, we instead plot the weighted averages for all the outcomes for these two groups in the following figures. For each outcome, the marginal effect of being a long duration member is simply the difference between these two estimates. The vertical bars in each of the figures correspond to 95% confidence intervals based on village-level clustered standard errors.

(a) Participation and Knowledge About Administration



(b) Financial Literacy & Autonomy

Figure 1: Knowledge and Autonomy: EB Results

Figure 2: Mobility, Information and Entertainment: EB

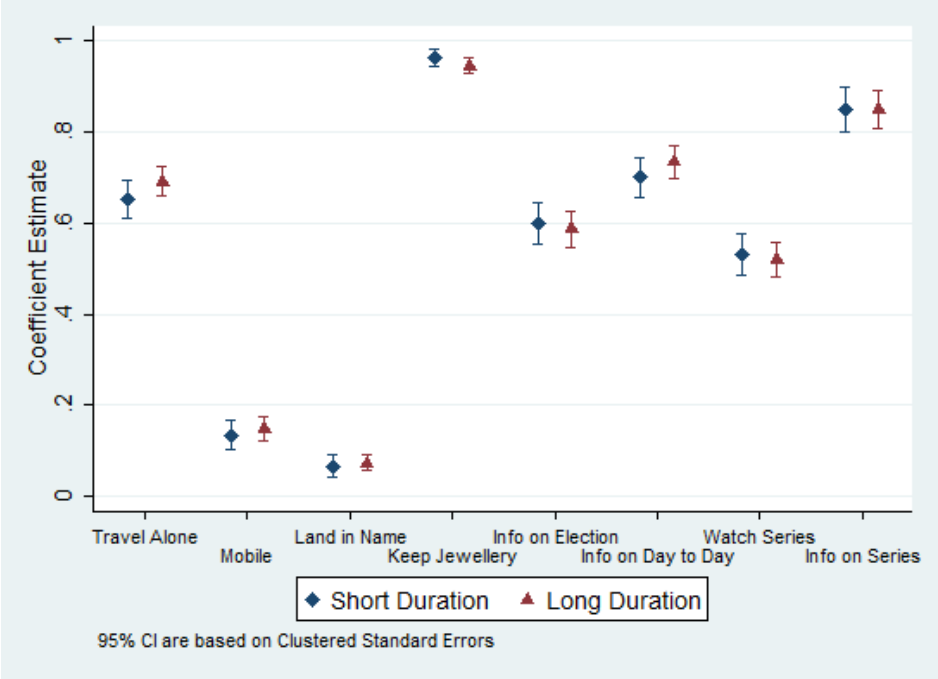


Figure 3: Decision-Making: EB

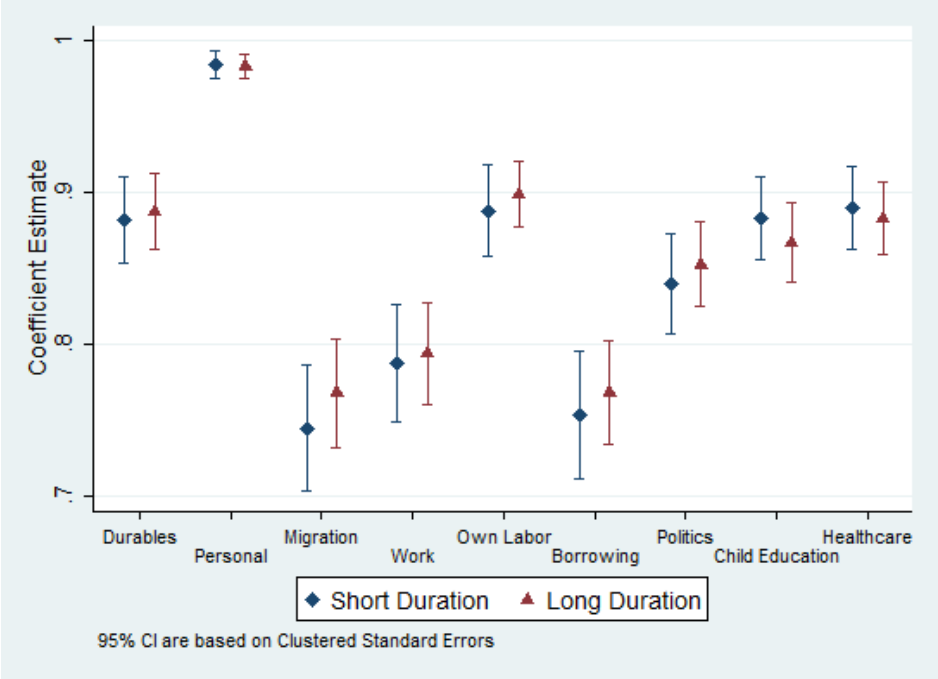


Figure 4: Collective Action Vignettes: EB

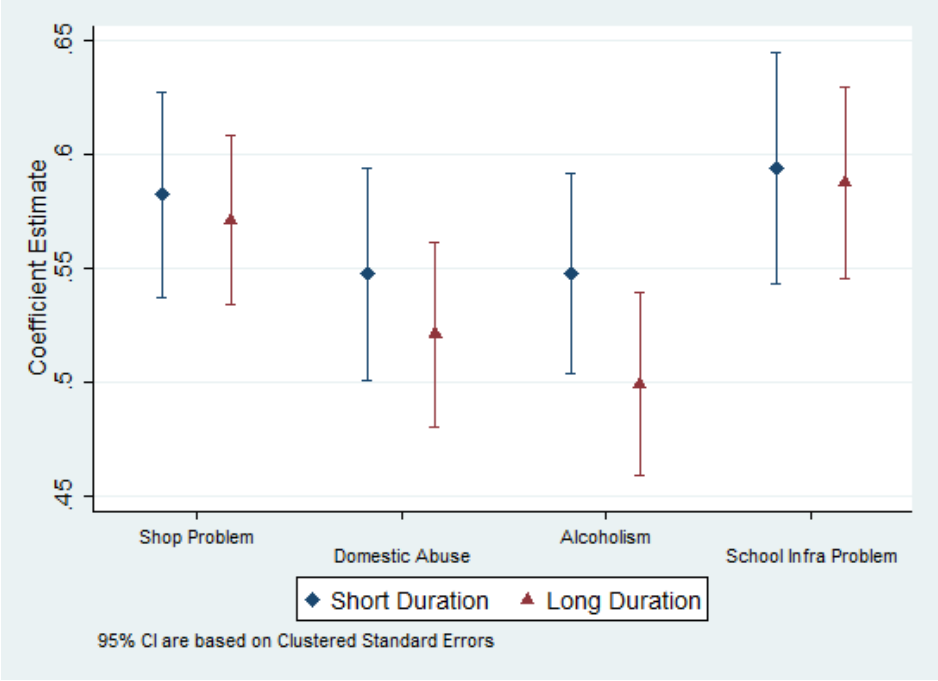


Figure 5: Personal Efficacy: EB

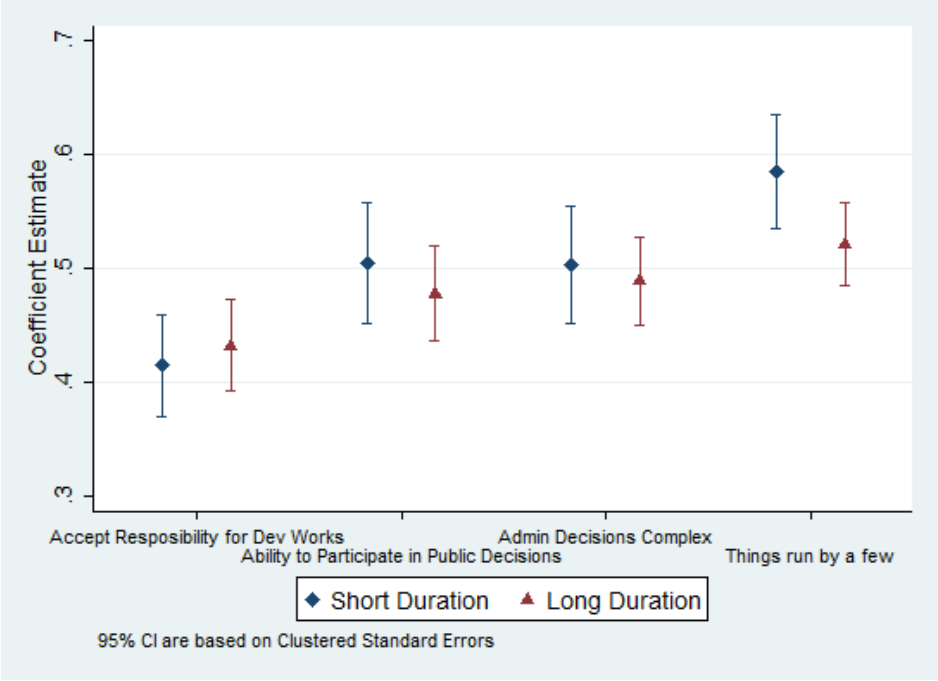
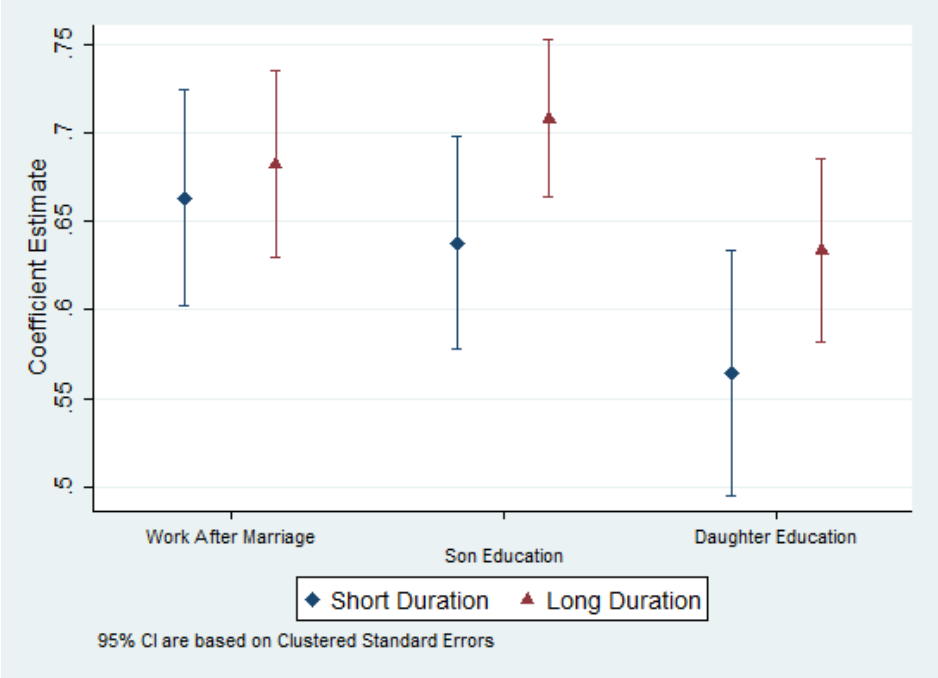


Figure 6: Aspirations for Children: EB



2 Regression Results for Other Economic Outcomes (Section 4.1.2 in the paper)

Table 1: Membership effects on household per capita monthly expenditure (in Rupees)

	HHPCE
SHG Member	43.111
	(51.451)
Constant	1297.184***
	(39.803)
N	9148

Village Clustered Standard Errors in Parenthesis
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Membership effects on Household Daily Wages (in Rupees)

	Daily Wage-Kharif	Daily Wage-Rabi
SHG Member	-7.649	-6.305
	(8.383)	(8.156)
Constant	161.751***	162.981***
	(4.507)	(3.456)
N	5581	6089

Village Clustered Standard Errors in Parenthesis
Agricultural, Skilled or Casual Laborers Only
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Membership effects on Household Income (in Rupees)

	Monthly Income -Kharif	Monthly Income-Rabi
SHG Member	-1893.346*	-1014.158
	(845.296)	(680.461)
Constant	10514.235***	9557.745***
	(703.112)	(419.210)
N	1037	1049

Village Clustered Standard Errors in Parenthesis
Rental Income Earneres and Salaried (Private or Government) Only
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Membership effects on Household Profits (in Rupees)

	Monthly Profit-Kharif	Monthly Prof-Rabi
SHG Member	-695.897*	-594.593
	(345.391)	(339.201)
Constant	3988.466***	3864.486***
	(237.116)	(231.997)
N	812	860

Village Clustered Standard Errors in Parenthesis
Self-Employed, Non-Farm Petty Businesses or Animal Husbandry
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3 Results for Membership Spillovers to Household Level Differences in Political Participation and Institutional Access (Section 4.2.1 and Section 4.3.3 in the paper)

Table 5: Political Participation and Institutional Access

	Weighted Proportions Non- Members (1)	Members (2)	Diff (Marginal Effect) (3) = (2)-(1)		N (4)
Political Pariticiption (Households) Section 4.2.1					
Gram Sabha Meetings	0.350	0.475	0.126	***	9156
Member of Gram Panchayat	0.019	0.035	0.016	***	9146
Institutional Access (Households) Section 4.3.3					
Sick Family Member	0.311	0.302	-0.009		9156
Obtain Certificate	0.198	0.202	0.004		9156
Trouble with Police	0.089	0.088	-0.001		9156
Child to High School	0.460	0.482	0.022		9156
Loan From Bank	0.112	0.124	0.012		9156

*Notes: *** is significant at 1%, ** at 5% and * at 10%*