

Self-Help Groups: An Empty Promise or a Genuinely Effective Tool for Socio- Economic Development

*A study of the impact of length of SHG membership on rural women's saving patterns and
financial control in Maharashtra, India.*

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Master Thesis for MSc Policy Economics
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10th of February 2018

Abstract

Self-Help Groups are an increasingly popular policy tool for boosting socio-economic development, access to financial services and women's empowerment. In India its use has grown exponentially in the last decades. It is therefore surprising that there is relatively little research that evaluates their long-term impact. This thesis aims to add to the academic literature and the policy debate by measuring the effect of the length of membership on the savings of rural women in Maharashtra, India, and the level of control they have over those savings. The nature of the data makes it necessary to use a variety of estimation techniques in order to ensure robustness of the results. This paper finds that SHGs are successful in increasing a rural woman's savings. However, on the basis of these findings we cannot conclude that women also experience an increase in control over those savings.

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1. Introduction

Savings are an important driver of both individual and societal welfare. At the level of the household, savings enhance the possibilities for consumption smoothing and investments in human and productive business capital. Field experiments show a considerable positive impact of increase in access to savings on various socio-economic development indicators such as (Prinia, 2015): empowerment and decision-making (Ashraf, Karlan & Yin, 2006; 2010), agricultural investment and production (Brune et al, 2011), entrepreneurial investment and activity (Dupas and Robinson 2013a), resistance to health shocks (Dupas and Robinson, 2013b). At the macro-economic level, saving rates are a significant predictive of economic growth (Karlan, Ratan & Zinman, 2014). Increase in access to safe savings possibilities is shown to have a positive effect on poverty reduction (Burgess and Pande, 2005).

In this light, the increased popularity of Self-Help Groups (SHGs) as a policy tool for boosting socio-economic development, access to financial services and women's empowerment is unsurprising. Self-Help Groups fall within the spectrum of micro-financial services as they are essentially tiny savings and loan cooperatives. Ten to twenty women meet every month to save a set amount of money, discuss the provision and repayment of loans to group members and the corresponding terms and any other issue the women deem important. The groups are self-help in the sense that all funds for loans are raised internally. This then makes them different from other micro-financial services. In those cases it is a bank or a micro-finance cooperative providing the services or in most cases the credit. As the women only loan the amount they have saved themselves or together, the argued advantage of Self-Help groups compared to 'standard' micro-finance is that it decreases the risk of over-indebtedness of an already poor population. Which is one of the leading critiques of micro-credit services (Morgan and Olsen, 2011).

Another large advantage is that apart from the costs of setting up and running the SHGs (ensuring meetings and proper accounting), there is no need for external funding. SHGs do not need investors in the way that standard micro-finance products do. Needless to say, this makes SHGs an attractive policy option for budget-constrained governments. All things considered, the tremendous growth of SHG membership, especially in India, is easily explained. For example, just within the India's National Bank for Agriculture and Rural Development (NABARD) programme's SHG membership alone has grown from 146,000 in 1997 to 49 million in 2010.

Naturally, such widespread use of SHGs as a policy measure to combat a wide variety of development issues raises the question of whether they are actually capable of attaining those goals. Unfortunately, the research on the impact or functioning of SHGs is somewhat scarce (Deininger and Lui, 2013; Husain, Mukerjee & Dutta, 2014). The available research is fraught with issues of selection-bias: women targeted with the programmes are often those from non-poor households already active in the public domain (Husain, Mukerjee & Dutta, 2014).

BAIF Development Research Foundation's (BAIF) SHG programme has been running for over 20 years in rural India. The aim of the programme is to provide rural women with a secure savings vehicle and thereby hopes to contribute to their financial independence. Their ultimate aim with the programme is that – through financial control over increased savings – women will have the tools in hand to enhance their family's welfare. Then this process should lead to socio-economic development of rural India (BAIF Development Research Foundation, 2016).

Naturally, one can ask the question of whether BAIF's SHF programme is attaining the goals for which it was established: to increase rural women's savings and control over their finances. The fact that the programme has been running for over twenty years provides an excellent opportunity to evaluate the long-term impact of SHG membership on these goals. Thereby, this paper hopes to add to the academic literature and the understanding of the effects of SHGs as a policy instrument for socio-economic development. Namely, most studies concerning SHGs or microfinance, conduct relatively short-term impact assessments with a maximum of 5 years (Banerjee, Karlan & Zinman, 2015).

In order to answer this question I personally collected the necessary data through interviewing a subset of the total SHG population in rural Maharashtra (Pune Area). Four villages were selected for this study. I attended monthly meetings of all groups from these villages that were established between 2000-2010 and 2015-2016. This resulted in a dataset of 444 women from 39 groups with a 67% response rate.

As this is observational data I was confronted with issues of selection bias. In order to attempt to disentangle the treatment effect of SHG membership on savings and financial control from bias, four different estimation techniques are used: clustered ordinary least squares (OLS) per year, clustered OLS comparing 'treatment' (2000-2010) and 'control' (2015-2016) groups, propensity score matching (PSM) comparing the same treatment and control groups, and finally an

instrumental variable (IV) approach is employed with the villages themselves as the instrumental variables. In the last case, only the data from 2000-2010 is used.

I find that SHGs are an effective tool in increasing both total savings and the rate of saving as a percentage of income. This could mean that SHGs are indeed an meaningful policy tool in driving development, assuming then that it is good to save more. Unfortunately, the findings do not support that SHG membership leads to an increase in a woman's control over her finances. In this light, it is important to realise that Self-Help Groups are not capable of tackling every possible development issue.

2. Relevant Literature

Rigorous research concerning the impact of SHGs on savings, financial independence and women's empowerment is scarce (Deininger and Lui, 2013). This section gives an overview of the results and quality of the literature on SHGs. The literature on SHGs can be divided into two categories: those concerning management and operations of SHGs and how they influence their success and those concerning the economic and social impact of SHGs. As research applying randomized controlled trials (RCT) is lacking on the topic of SHGs, this section provides a short evaluation of RCT studies concerning savings groups, commitment savings products and micro-credit. These programmes have some similar features to the studies SHG programme and therefore their results may therefore be applicable in this case.

2.1 Management and Operation of SHGs and how this influences their success

On the topic of management and operations of SHGs, studies have found several ways to enhance success of the programmes. First, a RCT in Kenya, Tanzania and Uganda finds that, by financing the financing through client fees, the operation of SHGs can be privatized after initial training. Privatized SHG programmes reach as many people as those run by NGO's and are more financially successful and business-oriented. Consequently, the cost of running SHGs for NGO's and perhaps the government could be decreased severely. There is one important side-note, it is unclear from this study if privatized SHG programmes target different women than 'normal' SHG programmes do. On the one hand, this could indicate targeting of services to those who could truly benefit. On the other hand, it could mean that the poorest of the poorest are ignored by a privatized SHG programme (Greaney, Kaboski & van Leemput, 2013).

Secondly, in a study on 1563 female-only SHGs in India, Vandewalle (2017) uses an instrumental variable (IV) and fixed effects approach to show that an internal ‘accountant’ as opposed to an external one was beneficial for the non-financial benefits that can be reaped from group membership. If one of the group members acts as the accountant this increases repeated interactions between members in the form of mutual assistance and collective action. This mechanism is extremely important for the ability of SHG programmes to develop social capital and increase engagement in community affairs. An external accountant tends to disrupt this process. One downside to the internal accountant is that she has a tendency to take advantage of her position, though this is agreed to implicitly by other group members. This can be reduced by ensuring that more than one woman possesses accounting skills and the position is rotated.

Furthermore, Deininger and Lui (2013) find that SHGs organised into a ‘federal’ structure (SHGs are organised in meetings at the village and county level) combined with a focus on social issues and women’s empowerment can show significant social and nutritional effects even in the short-term. These effects protrude beyond the women participating in the SHG. In other words, there is a community effect. The treatment effects were estimated through a mixed method of pipeline comparison, Propensity Score Matching (PSM) and difference-in-difference (DID) using data on approximately 5500 Indian households in 600 villages enjoying two different SHG programmes.

On the basis of these studies one may conclude that in order to make SHG programmes more successful in addressing social issues the accountant should be internal, the groups should be organized in a federal manner and the programme should focus on social issues and women’s empowerment. As will be discussed later, BAIFs programme adheres to all these requirements. First of all because one of the group members is in charge of the financial documentation. Secondly, the SHGs are organized into clusters at the village level, so there is some kind of a federal structure. Lastly, BAIF does aim to enhance women’s empowerment through providing more financial security. The architecture is therefore there to predict a positive effect of SHG membership.

2.2 The financial and non-financial impact of SHGs

The studies that do look at the effect of SHG membership find both financial and non-financial effects. Apart from running through the main results presented in these studies, I will briefly describe the data used and methods employed to find those results.

In a slightly different type of SHG programme Swain and Varghese (2009) find that SHGs can lead to an increase in the amount of savings held by the participant. The main reason being that the participants were only eligible for loans after having reached a certain savings threshold together with the group. Only after that loans the size of multiples of the total group savings were made available to the participants. They perform a regression with extensive controls using survey data from 1000 households in India. The treatment group consists of women who have reached the threshold necessary to apply for a loan, the control group comprises of the women who have not yet saved enough to access credit.

Other studies on the effect of SHGs find that they impact a wide variety of socio-economic parameters. Using a mix of PSM and DID, Deininger and Lui 2013 show that SHGs enhance empowerment, nutritional diversity and increase levels of consumption.¹ Another study using a similar approach, but based on data collected through surveying through recall, also find increases in levels of empowerment. However, this type of data collection may be susceptible to recall bias. In order to come to this conclusion household survey data on 961 women, originating from 5 states in India, was used (Swain & Wallentin, 2009). Mohaptra and Sahoo (2016), by using matching on the basis of maximum likelihood, also find positive effects on empowerment. They also find that SHG programmes bypass the poorest of the poor. Another study that claims empowerment effects, is the analysis of 80 men and women, members and non-members conducted by Sharma et al (2014). The sample is surveyed and asked to provide some answers by recall (again bear recall bias in mind).

There is enough reason to believe, if only for the fact that it is discussed in the mentioned papers, that selection-bias could be an underlying factor at play in these studies. However, when comparing women who have been an SHG member for longer than 6 months with those who just joined in West Bengal, Husain, Mukerjee & Dutta (2014) conclude that SHG's genuinely have an effect and that it is not merely self-selection. Their conclusion is based on the argument that if it were merely self-selection, then no positive effects would be seen over length of membership.

Yet another study finds increases in women's autonomy due to SHG membership. However, no increase in subjective well-being was found. A mix of PSM and IV methods were used to estimate treatment effects using somewhat qualitative data from 400 households in Odisha, India (de Hoop

¹ This is the same study as the one described above.

et al, 2014). A last found effect is an increase in women's participation in the community and social action programs (Tesoriero, 2006).

Taken together, there is research to suggest that there can be positive effects on both savings and control over finances. However, as none of these studies employs methods that can completely keep bias in check, one must exercise caution when interpreting the results. Correlation is not causation.

2.3 RTC studies on programmes with similar aspects as SHGs and their impact

Though studies applying RCT to measuring the effect of SHG programmes are non-existent, they have been done on programmes that have similar aspects: savings groups, commitment-savings products and micro-credit programmes. The savings groups in Mali essentially work the same as an SHG, except for the fact that they meet weekly and end at a predetermined date. At that date the savings and interest made on loans are divided amongst the members. A RCT on the impact of these savings groups showed that savings were increased. Furthermore the access to the programme increased investments in livestock, improved food security and smoothed consumption. The study found no results to support that investments in health or education. Also, it showed no improvement of a woman's position within the village (Beaman, Karlan, & Thuysbaert, 2014).

In the Philippines a study was done on the impact of a commitment savings product. The money in the account could not be withdrawn until the self-chosen date. However, there was no official obligation to deposit money into the account. The RCT study showed that the product has a positive influence on women's household decision-making power, self-perception of savings behaviour and consumption decisions concerning durable goods (Ashraf, Karlan, & Yin, 2010). As an SHG is essentially also a type of commitment savings products this research may be applicable in the case of SHGs as well.

Lastly, in an evaluation of six RCT micro-credit studies, it was found that there are slight positive effects of micro-credit on women's empowerment. The researchers recognize that due to low take-up of the programmes and the measurement of the intent-to-treat effect the effects may have been underestimated (Banerjee, Karlan, & Zinman, 2015). As both SHGs and micro-credit programmes have a group-lending component, it is possible that these effects are also applicable in the case of SHGs.

3. Programme

Currently, BAIF operates around 500 SHGs across India in nine different states. In the studied state of Maharashtra, BAIF has established around 200 SHGs in the past two decades. Almost all of these SHGs were established within a 15 kilometre radius of BAIF's Community Health Research Centre (CHRC); which is the centre responsible for establishing and maintaining SHGs. Of these 200 established SHGs there were 120 still in existence in February of 2016.

When establishing new groups, BAIF will first target villages where they have had previous experience.² Within those villages BAIF approaches women with a fairly public role, such as a primary school teacher, as they have larger networks and will therefore be able to find other women to join the group relatively easily. This process ensures mutual trust and relatively similar saving capacity. BAIF has no influence over the decision of membership. Their only criteria are that the women must be 18 years of age, own some form of identification and must be willing to pay a yearly administrative fee of ₹50 and a yearly ₹250 health insurance premium.

The SHGs meet every month. The new SHGs are helped during their meetings by BAIF's social workers or experienced SHG members who wish to contribute to their community. This ensures that enough women in the group learn the necessary accounting and administrative skills. At the monthly meetings the monthly savings, usually between ₹40 and ₹500, are collected. Furthermore, applications for new loans and repayment of outstanding loans are discussed.

There are various conditions applicable to loaning from the SHG. Firstly, when applying for a loan women must also state its purpose. However, contrary to most standard micro-credit services, the loan does not necessarily have to be for economic activities, such as starting or financing a micro-business. In fact, most loans requested by the women are to pay for their children's' education, daughters' weddings or health care costs. The reason then that the purpose must be stated is that this helps the women in deciding the urgency of loans and in case of a budget-constraint, to divide the money based on need. A second condition, and reason for the statement of the purpose, is that the loans operate using a buddy-system. Another woman in the group will also be liable for the loan. She is also the person that will monitor whether the loan is used for the

² Apart from the SHG Programmes BAIF also conducts programmes in: livestock development, water resource management, sustainable agriculture, sericulture, agri-horti-forestry, agri-business, environmental conversation, consultancy services, and capacity building and training (BAIF Development Research Foundation, 2016).

intended purpose. The last noteworthy condition is that the interest due on the loan may never exceed 2%.



Figure 1: BAIF's SHG operating area: 15 km around Urulikanchan.

Red Dot: BAIF Community Health Research Centre,
Green Outline: Villages with active groups,
Orange Outline: Villages which once had SHGs,
Circle: 15 km radius from BAIF's Community Health Research Centre

Each group is also a member of a cluster at the village level. Smaller villages will only have one cluster or even share a cluster with a neighbouring village. Larger villages, such as Urulikanchan, will have several clusters. In other words, the SHGs are organised into a federal like structure. At cluster meetings, representatives from all member SHGs are present. At these meetings, the SHG contribution to the clusters are collected, terms for new loan applications are determined, repayment of outstanding loans are monitored and any community issue the women deem important is discussed. Furthermore, the cluster meetings are often used as a platform for NGO's or the government to communicate to rural women. Mostly these organisations convey information on free or low-cost training programmes language, accounting, business practices or skills such as toy or artificial jewellery making.³

Pertaining to the SHG programme, the official function of the clusters is to provide for loans that exceed the amount saved within the SHG. Unofficially, the cluster functions as a communication, networking and knowledge sharing medium for the women. In the case that the loan even exceeds the amount that the cluster can provide, the group can choose to lend from BAIF's Rotary Fund or from a bank. In each of these three situations the loan will be a group loan. Therefore, these loans will look a lot more like the more standard micro-finance products.

4. Data and Methodology

As discussed above, this thesis aims to answer the question whether SHGs are successful in promoting female financial independence. In order to do so, I estimate both the input and outcome variables using observable characteristics. SHG 'treatment' is proxied by length of membership. Female financial independence is estimated through evaluating savings and control over these finances. In this section I develop the conceptual model that leads me to predict that length of membership should have a positive effect on savings and control over finances. I also discuss the data used and the method used to collect that data, remaining concerns for bias and the econometric methods – and their limitations – employed to test the hypotheses. 4.1 Conceptual Model, Research Question and Hypotheses

The question is then why should SHG's, of which the treatment is measured in the length of membership, have a positive effect on a woman's savings and her control over her finances. As for

³ The Indian government runs 600 such programmes, BAIF runs around 20.

the answer to the first question, SHGs should remove, or at least diminish, many of the barriers the poorest of the poor in developing countries face when attempting to save. Increased savings mean increases in a woman's financial assets. The latter is considered to be an important factor in determining intra-household bargaining power. These mechanisms are discussed at length in this section.

4.1.1 How SHGs tackle barriers to saving experienced by the poor

The biggest barriers to savings experienced by the poor include high transaction costs, information and knowledge gaps, lack of trust, social constraints and behavioural biases (Karlan, Ratan, & Zinman, 2014). I argue, based on academic literature that BAIF's SHGs are a successful at tackling all of these barriers.

In India, transaction costs involved with saving at either the bank or in cash are extremely high. Though we have seen that BAIF's programme also involves some small financial and non-financial costs to SHG savings (yearly administration fee, mandatory health insurance premium and the time it takes to travel and partake in the meeting), these are arguably much lower than the costs involved with saving either in cash or at the bank. Often, bank accounts require a minimum deposit, periodic deposits and transaction fees. The costs can create a substantial barrier to saving (Karlan, Ratan, & Zinman, 2014). The issue of the minimum deposit has also been tackled by the Pradhan Mantri Jan-Dhan Yojana (PMJDY) scheme. The scheme ensures bank accounts without a minimum deposit and another number of attractive conditions for the poor as Prime Minister Modi has earmarked financial inclusion as a top national priority. Nonetheless, the other issues remain, including the high cost of withdrawing cash which is especially high in India. This is due to high withdrawal fees and lengthy lines at the bank. Additionally, not every town, village or hamlet in India has their own bank. They can, however, have their own SHGs, decreasing travel time necessary in order to save. All in all, an SHG can serve as an attractive option to counter saving at a formal financial institution.

These are just the transaction costs of saving at a bank. Another option is to save in cash. Again, these costs can also be extremely high, especially in India. The first and foremost reason is inflation: cash loses value over time. Secondly, cash savings are not necessarily a 'safe' or productive means of saving. Societal constraints, discussed further on in this section, can make savings in cash unfruitful and therefore undesirable. Not to mention the fact that the value of cash

is subject to government policy. This study was conducted during the first four months of Modi's abolishment of the ₹500 and ₹1000 notes. This further confirms the idea that savings in cash are not in any way desirable. Of the women interviewed in this study 57% claim to have experienced problems due to this policy. SHG membership could lower these transaction costs by offering a safe place to save, with interest to counteract inflation and free of societal barriers to savings.

As mentioned above, an important barrier to savings, especially when it is done in cash, are societal constraints. Richer households are pressured to assist those family members or friends in need, especially when the amount of savings is public knowledge. Various studies have shown that providing limitations or restrictions to withdrawing savings or the possibility to save without it becoming public knowledge are successful in increasing savings amongst the poor (Platteau, 2000; Baland et al, 2011; Jakiela and Ozier, 2012; Giné et al, 2017). As the money saved at the SHG can only be used when the entire group considers the loan to have a meaningful purpose, SHGs can provide a vehicle for savings that can be kept 'safe' from demanding friends and family members.

Another important barrier to savings is the lack of trust in financial institutions (Karlan, Ratan, & Zinman, 2014). SHG membership tackles this issue. As women choose their own group based on trust and similar socio-economic standards. By definition, the trust within the group will always be higher than trust in an external party. Not to mention, as the women cooperate over a long period of time the level of trust is likely to increase.

Not only that, there are various behavioural biases that encourage under-saving. Such biases include present-day preferences (Laibson, 1997; O'Donoghue and Levy, 1999; Fudenberg and Levine, 2006), loss aversion (Karlan and Zinman, 2012; Benartzi and Thaler, 2004), biases in expectations due to over-optimism (Brunnemeier and Parker, 2005), biases in price perceptions due to under-estimating compound interest (Stango and Zinman, 2009; Song, 2013) and inattention to saving as a means for problem-solving (Spiller and Lynch, 2010; Karlan et al, 2016). Essentially, a SHG is a commitment savings product. Research shows that present-day preferences can be mitigated through compliance mechanisms (Shefrin and Thaler, 1988; Ashraf, Karlan & Yin 2006; 2010; Brune et al, 2011; Dupas and Robinson, 2013b). It should therefore be well-equipped in dealing with this issue.

As for the other behavioural biases, SHGs can help in most cases. Gaining experience through saving in a familiar environment with a high focus on improving financial literacy can help women with possible over-optimism and underestimation of compound interest. Additionally a monthly

reminder to save and exhibition of the possibilities of what can be done with those savings (other women loaning money from the fund) can help keep savings as a method for problem-solving on the mind. The only bias that the SHG cannot tackle is loss-aversion, as this is truly inherent to saving. Saving by definition involves losing something now which can be gained later.

The last barrier to savings for the poor often discussed in the literature is low financial literacy and information and knowledge gaps. In India, financial literacy is extremely low (Cole, Sampson, & Zia, 2011). Whether this is a root cause of sub-optimal savings is however not supported by the academic literature. Studies conducted, a lot of them in India, show ambiguous results in whether financial literacy training increases saving propensities (Cole, Sampson & Zia, 2011; Carpana et al, 2011; Field, Jayachandran & Pande, 2010; Seshan and Yang, 2012). It is however important to mention that so far, these studies have been unsuccessful at determining whether the meagre to non-existent effect on savings is due to the fact that financial literacy training truly does not help, or whether that is due to the low take-up rates and possible low quality of the programmes (Karlan, Ratan, & Zinman, 2014). On the notion that at least in India financial literacy is low and that it could theoretically be a cause of sub-optimal saving, SHGs provide relief to this issue. Women are trained in financial accounting, they help each other with their finances, the women gain experience concerning financial decision making and lastly BAIF helps with issues such as setting up bank accounts.

To conclude, of all the barriers to save the poor face in India, many are torn down by the option of saving at an SHG. Consequently, SHG membership should turn out to be effective in increasing a woman's savings overall. This should also improve over time due to the barriers such as trust and financial literacy. With more trust in the system and a better understanding of it, women should be willing to save more. Based on this I hypothesise that the length of membership will have a positive effect on the level of a woman's savings.

4.1.2. How SHGs can increase a woman's intrahousehold bargaining power and therefore financial control.

The second estimator of financial independence used in this study is a woman's control over those finances. The question is then, why should SHG membership increase female financial control. Research shows that providing microcredit exclusively to women does not necessarily

increase the amount of control they had over those loans. More often than not, women were merely used as a means to an end by their families (Goetz & Sen Gupta, 1996).

Research also shows that the distribution of bargaining power within the household is driven by a woman's ability to credibly threaten to leave the household. That credibility is dependent upon factors such as earning power, financial assets, divorce or employment legislation (Browning & Chiappori, 1998). Arguably, an increase in a woman's savings and ability to access credit could bring about a shift in this bargaining power (Armendáriz & Morduch, 2010).

Contrary to microcredit services, SHGs provide women with inherently more control of the finances. The savings and loans at the SHG are managed by the women themselves. These women are educated by volunteers and BAIF's social workers in financial accounting. All women must agree on whether the loan is for a proper purpose and other women check whether the loan is being used for that purpose. In the case of microcredit, it is only a woman who has to apply for a loan together with other women. They however have no control over whether the loan is extended, that is in the hand of the bank or institution supplying the credit. Therefore, I argue that SHGs provide inherently more control over finances than microcredit.

Taking this notion together with the increase in bargaining power due the SHG activities, the increase in assets and possibly even earning power (by taking loans to invest in entrepreneurship) women experience an increase in intrahousehold bargaining power. In turn, this will increase the amount of control they have over the family's finances. Naturally, these effects increase with time as savings and experience in managing finances will increase over time. Consequently, I hypothesize that SHG membership has a positive effect on female financial control.

4.1.3 Conclusion

To conclude, in this thesis I aim to answer the question of what the impact is of length of SHG membership on a woman's savings and her financial control. On the basis of economic theory, previous research and logical reasoning I hypothesize that both effects are positive.

4.2 Data

4.2.1 Data Collection Method

As BAIF lacked extensive, reliable and sufficient data on the situation of the individual members, the only way to collect this was to interview the women. The question was then how to do this and which women should be interviewed.

There were a couple of constraints to consider when deciding which women could be interviewed. Primarily, I was only in India for 4 months. The first of which was necessary for setting up the research project. The last month was used to write a preliminary report to be presented to BAIF. Furthermore, I was only able to access women in SHGs and I would only be able to access groups as a whole. A random selection of women was therefore out of the question. Additionally, in order to conduct an analysis on the effect of membership that would have some meaning I would need women from very old and very new groups. Then at least I would be able to look at the effect of the length of membership. In order to ensure a sufficient time comparison I chose to interview groups established between 2000 and 2010 and compare them to groups established in 2015 and 2016. This way the effects would have at least 5 years to manifest. Which is a longer period of time than any other study has looked at. The last consideration is that there is no trend data available on any of the villages. In order to at least not be bothered by village specific effects I chose to only interview the villages which had groups from each of these time periods. All groups established within these periods was surveyed.

The survey used was developed by myself through a study of the literature, a couple of rounds of testing and feedback from my supervisor and the coordinator of BAIF's SHG programme. After this I tried out the survey on a couple of groups that I would not interview. Questions that were then unclear were adjusted or removed.

Together with a girl from the village as a translator, we interviewed 444 women from 39 groups during their monthly meetings. All women present at the meeting filled in the questionnaire. This resulted in a total response rate of 69%. When there were illiterate women they were interviewed by the translator. Bear in mind when interpreting the data that it was impossible to stop these women from speaking to each other and sharing and comparing answers.

In light of issues such as answer-sharing and copying, illiterate or uneducated women and the desire to give socially desirable answers, the reliability has accurate representations of the truth is

somewhat doubtful. Some variables experience this problem more than others.⁴ Of all the data collected, only the savings at the SHG could be verified.

To indicate the level of unreliability: even though the information of the total amount of SHG savings was available and discussed at every SHG meeting, 63 women out of 444 managed to misreport their savings. That is 14%. These mistakes in reporting have been corrected in the dataset used for the analysis to ensure a higher accuracy of the results. Nonetheless, this misrepresentation rate of 14% even though the ‘correct’ answer was readily available at least provides an indication for the level of caution that must be practiced when interpreting and generalizing the findings represented in this thesis.

4.2.2. Dataset and its representativeness of the general Indian population

As explained in the previous section, of the 15 villages where BAIF runs groups data was collected on groups established between 2000-2010 and 2015-2016 in four of those villages: rulikanchan, Boriandi, Koregaon Mul and Kunjirwadi. The dataset provides information on 444 women from 39 SHGs. It is important to note that this dataset is in no way the result of random sampling from the female Indian population or from the SHG population in the area.

This is confirmed by table 1 which compares the sample population to the general Indian population. We see that women in our sample population are on average of a higher caste, employed almost 3 times as often, more likely to be Hindu and have bank accounts more often. Therefore caution must be practiced when generalising the results of this study for the broad public.

Variable	Sample	Female Population 4 Villages	Population Pune District	Population Maharashtra	Population Maharashtra Rural
Literacy	80%	77%			
Backward class ⁵	7%	19%			
Employed	82%	28%			
Hindu	93%		85%	80%	88%
Household Bank Account	82%			69%	

Table 1: Comparing Population Sample to General Indian Population⁶

⁴ For a discussion on this see section 7.

⁵ The Indian Government categorizes all Indian castes into three ‘class’ categories: General Class, Other Backward Class, and Backward Class.

⁶ Source: Indian Population Census 2011 available at < <http://www.census2011.co.in/> >.

4.3 Selection Bias Issues

Considering the fact that this study does not concern a randomized controlled trial it cannot be guaranteed that there is no selection bias between women who have chosen to enter into a SHG earlier rather than later (Angrist & Pischke, 2009). To put it differently, women who became a member at other periods in time may differ in ways that influence their savings behaviour or their financial independence. Looking at the descriptive statistics presented in section 4.2.2., it is safe to say that the women are not similar on all factors except for the year of membership. This paragraph examines the possible different sources of selection bias inherent to this programme. Both supply and demand side selection bias will be considered.

4.3.1 Supply Side Selection Bias

In short, supply side selection bias entails that BAIF may have targeted different women for the earlier groups than the later groups. When looking at their policy of how they establish new groups, in targeted or new villages, it is clear that this selection is not done randomly. In the academic literature, this is the exact reason why a lot of studies on this subject are considered unreliable (Husain, Mukerjee, & Dutta, 2014).

First, the villages targeted by BAIF first were villages where they have had previous contact. The possible bias could go two ways. One possibility is that the villages where BAIF has had contact for a longer period of time were those villages that inherently needed it. Therefore it is possible that those women are poorer and more backward compared to the women in the surrounding villages. This would manifest in an underestimated treatment effect.

The bias could also be argued to go a different way. Long term influence by BAIF could entail that these villages have benefitted immensely from other BAIF programmes. This could mean that the women are in fact relatively 'rich' and less backward than those in other surrounding villages as they have not been exposed to BAIF's extensive development projects. If this type of selection bias were to manifest this would result in an overstatement of the treatment effect.

A second issue concerning selection bias is inherent to the manner in which BAIF targets women for new groups. As explained in section 3, women that are already public figures are approached first. This woman then gathers her friends and family members into a group. Arguably, these women could be more highly educated and therefore have an inherent tendency to save more (Banks and Diamond, 2010; Pirtillä and Suoniemi, 2014; Gordon and Kopczuk, 2014).

Additionally, women that are public figures may already be more independent and therefore enjoy more financial independence. Either way, this could lead to an overestimation of the treatment effect.

On the other hand, it is BAIFFs mission to help the development of rural backward India, this could then mean that the women that were first approached fit into these categories. This is also somewhat backed by what I saw in the field. From the newest groups I had my doubts on whether these women actually needed an SHG, or whether that it was becoming somewhat of a social requirement. In this case, the treatment effect would be underestimated.

4.3.2 Demand Side Selection Bias

Regrettably, the demand side selection bias could also manifest in both ways. On the one hand, there may be a case of a first-mover effect. Relatively independent women who already see the benefits of saving may be the first to join. Consequently the treatment effect would be overestimated. On the other hand, it may be the poorest and most backward women who have the most to gain from such a programme. As a result, the treatment effect will be underestimated. However, this latter option is unlikely. Many studies show that SHG programmes have the tendency to exclude the poorest-of-the-poor, the ethnically divergent and the lowest castes (Attarya, Gnawali and Palley, 2016; Mohapatra and Sahoo, 2016).

Additionally a survival-of-the-fittest mechanism may cause bias in the results, especially when comparing groups established in 2000-2010 to those established in 2015-2016. Groups can cease and have ceased to exist. Women can also leave the SHG. Therefore, it may be the case that the most successful women or the women that benefit most from the programme will remain in the SHG longer. This would lead to an overestimation of the results.

A last concern for bias is that the cohorts joining later may be inherently different from the cohorts that originally joined. Over the last twenty years, India has experienced enormous socio-economic development. Not only have Indian women seen a female prime minister and president as potential role-models, the Indian government had been actively promoting prosperity and socio-economic development; especially of women. For example in all elected government bodies there is a minimum number of women (Nair, 2016). All children can attend school for free till the age of fourteen. (Lok Sabha Secretariat, 2013). Dowry is illegal (Government of India, 2015). There are several advantages for the woman over the husband to be owner of the home or business, such as

tax cuts or exemptions, laws mandating this in certain cases, and lower mortgage interest (Shanu, 2016). And lastly there are various campaigns to ensure the safety of the unborn female child (Johari, 2015). Women who belong to the later cohorts, and therefore join later, may be inherently more prosperous, independent and empowered. This would lead to an underestimation of the treatment effect.

4.4.3 Conclusion

When considering the length of memberships as treatment there are a lot of concerns for selection bias. Unfortunately, the bias may go both ways. It is therefore impossible to determine if the estimates will likely over- or underestimate the treatment effects. When comparing the issues to what I have seen in the field, I would say that all of these issues are in place. Fortunately, some of these biases can be controlled for. Nonetheless, as this study does not evaluate the treatment effect of individuals who were randomly assigned, I cannot be sure that there are no unobservable variables that influence the outcome.

4.5 Econometric Models

The challenge is then to tackle these issues of selection bias as best I can. Now having reviewed the data, data collection methods and possibilities for bias, this paragraph will discuss the econometric methods used and their potential in estimating a causal effect. In other words, I evaluate whether these methods are capable of accounting for the selection bias issues discussed in section 4.3. Unfortunately we see that all three methods – clustered ordinary least squares regression, propensity score matching and instrumental variables – have short-comings.

4.5.1 Ordinary Least Squares

Two OLS analyses are conducted. The first is an analysis of the effect of one year of membership on savings and financial control. The second is comparing ‘long membership’ (being a member of group established between 2000-2010) and ‘short membership’ (being a member of a group established in 2015-2016). In order for an OLS Regression to measure a causal effect, the treatment and control groups must be similar on all characteristics except for the treatment. This is called the conditional independence assumption (Angrist & Pischke, 2009).

	2001	2002	2003	2004	2005	2006	2008	2009	2010	2015	2016	Total
Age	40.2	42.4	43.0	42.5	38.8	41.7	40.5	36.0	39.5	33.9	34.4	38.8
Religion												
Buddhist	0%	0%	4.17%	0%	5%	9%	5%	0	4%	0%	0%	2%
Muslim	7%	2%	0%	0%	4%	3%	0%	0%	8%	10%	3%	3%
Hindu	93%	98%	92%	98%	89%	89%	95%	100%	88%	89%	97%	93%
Other	0%	0%	4%	2%	2%	0%	0%	0%	0%	2%	0%	1%
General Class												
General Class	79%	70%	62%	74%	54%	77%	60%	70%	86%	73%	47%	65%
Other Backward Class	21%	24%	24%	24%	46%	20%	20%	20%	14%	20%	42%	28%
Backward Class												
Backward Class	0%	7%	14%	2%	0%	3%	20%	10%	0%	7%	11%	7%
Literacy Rate												
Literacy Rate	73%	85%	67%	77%	79%	89%	74%	90%	70%	89%	80%	80%
No Education	7%	13%	17%	17%	21%	9%	24%	5%	14%	10%	18%	15%
Primary Education	27%	13%	17%	21%	9%	6%	2%	20%	0%	3%	9%	10%
Secondary Education	53%	53%	46%	40%	54%	56%	51%	50%	64%	57%	50%	52%
Tertiary Education	13%	21%	21%	21%	16%	29%	22%	25%	23%	30%	23%	23%
Married												
Married	87%	87%	79%	88%	91%	94%	81%	90%	95%	95%	93%	90%
Children												
Children	2.5	2.2	2.2	2.3	2.3	2.1	2.5	2.0	2.3	1.9	1.9	2.2
Household size												
Household size	4.9	5.1	5.6	5.9	5.4	5.1	6.3	5.4	6.5	4.8	4.8	5.3
Unemployed												
Unemployed	7%	19%	17%	8%	7%	9%	14%	40%	54%	27%	18%	18%
Unemployed Husband												
Unemployed Husband	7%	2%	4%	0%	2%	6%	0%	0%	4%	0%	3%	2%
Koregaon Mul												
Koregaon Mul	0%	0%	0%	0%	23%	0%	0%	50%	0%	29%	0%	9%
Urulikanchan												
Urulikanchan	0%	49%	58%	56%	39%	63%	100%	50%	100%	59%	49%	57%
Boriandi												
Boriandi	0%	51%	0%	18%	39%	37%	0%	0%	0%	0%	49%	23%
Kunjirwadi												
Kunjirwadi	100%	0%	42%	26%	0%	0%	0%	0%	0%	13%	0%	10%
Number of women												
Number of women	15	47	24	50	57	35	42	20	24	63	67	444

Table 2: Descriptive Statistics per Year of Establishment.

	Control	Treatment	Difference
Age	34.10	42.04	-7.94***
Buddhism	0.00%	3.33%	-3.33%**
Muslim	6.25%	1.11%	5.14%***
Hindu	93.97%	94.81%	-1.85%
Other	0.78%	0.74%	0.04%
Caste			
General Class	58.82%	68.33%	-9.54%*
Other Backward Class	31.93%	25.78%	6.15%
Backward Class	9.24%	5.86%	3.38%
Education			
Literacy Rate	84.38%	77.36%	7.02%
No Education	14.06%	17.42%	-3.34%
Primary Education	5.47%	12.88%	-7.41%**
Secondary Education	53.91%	52.23%	1.63%
Tertiary Education	26.56%	17.42%	9.14%
Household			
Married	93.80%	86.42%	0.07**
Children	1.89	2.34	-0.44***
Household size	4.81	5.56	-0.75***
Unemployment			
Unemployed	22.48%	15.56%	6.93%*
Unemployed Husband	1.55%	2.59%	-1.04%
Villages			
Koregaon Mul	13.95%	7.04%	6.91%**
Urulikanchan	54.26%	58.52%	-4.25%
Boriandi	24.81%	20.74%	4.07%
Kunjirwadi	6.20%	13.70%	-7.50%**
Number of Women	129	269	

Table 3: Descriptive Statistics of Treatment (est. 2000-2010) and Control Group (est. 2015-2016). To see the pure effect of the year of established on which the treatment variable is based, the women who joined those groups in later years were removed from the sample. ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.

As we saw in section 4.3 there are some problems with this assumption in this case. As we see when evaluating the descriptive statistics displayed in tables 2 and 3, the unlikeness that the conditional independence assumption holds in this case is very low. The background variables are too often too different at a statistically significant level. We see that there are more Buddhists and less Muslims in the treatment groups, women in the treatment group are of a higher caste, more of

them have only finished primary education, they have bigger families, less are married (probably due to a higher percentage of widows in the older groups), more are employed and their husbands work less. As we know these variables they can be controlled for in the analyses. However, this huge disparity in the descriptive statistics make it increasingly likely that there are difference in omitted variables that I cannot control for. Therefore, it is difficult to assume that the conditional independence assumption holds. In other words, I cannot guarantee that the groups are sufficiently similar in order for an OLS analysis to discern a causal effect.

4.5.2 Propensity Score Matching

Propensity score matching requires a binary treatment variable. Therefore for this analysis the women in groups established in 2015 and 2016 are the control group. Women in groups established between 2000-2010 are the treatment group. Consequently, the method still attempts to estimate the effect of the length of membership.

Similar to OLS Regression, Matching is a control strategy. In order to interpret the estimations as a causal effect, the conditional independence assumption must hold (Angrist & Pischke, 2009). As we have seen above, it is not safe to say that the treatment group is similar to the control group. For that reason, we must be cautious in interpreting the estimates as a causal effect. Again, the direction of the causality or the interference of unobservable characteristics will be difficult to determine.

Apart from the conditional independence assumption for causal effect, choosing appropriate covariates on which is to be matched also dictates several criteria. As omitting important variables can increase bias in the estimates (Heckman, Ichimura, & Todd, Matching as an econometric evaluation estimator: evidence from evaluating a job training programme, 1997) (Dehejia & Wahba, 1999), this process must be completed with care. The first important thing to note is that the data on the covariates for the control and treatment group must stem from the same source (Heckman, LaLonde, & Smith, The economics and econometrics of active labor market programs, 1999). This condition is met as all data stems from the survey.

Included covariates must influence both the participation decision and the outcome variable. This must be determined on the basis of economic theory, previous research and information on the institutional settings of the treatment programme (Smith & Todd, 2005). Additionally, only covariates that cannot be influenced by participation in the treatment can be included. This entails

that the variable either needs to be fixed over time or measured before participation. (Caliendo & Kopeinig, 2008).

These two criteria have led to the selection of the following as covariates to be matched upon: village of residence, age, caste and education. In most cases the village of residence is determined before joining the SHG. Of the 444 women surveyed only 10 have moved villages since joining an SHG. Whether the village of residence influences both the participation and the outcome variable is debatable. In the next section we see that the village of residence is correlated strongly with length of membership. Furthermore, there are substantial wealth differences between the villages. This may influence saving patterns.

Age influences both the participation decision and the outcome variables concerning savings. As participation is only allowed from the age of 18, there is a minimum age. Additionally, older women can have spent more time saving money. The chance their savings are higher is existent. The first condition holds. The second condition holds as well because treatment cannot influence age by definition.

Concerning caste both conditions also hold. First, studies have shown that SHG programmes fail to reach the ethnically diverse, low caste and poorest of the population (Attarya, Gnawali, & Palley, 2016) (Mohapatra & Sahoo, 2016). As caste is somewhat predictive of socio-economic class and opportunities it is likely that savings decisions and agency are also influenced by caste. The second condition also holds because caste is determined outside the model.

The conditions also hold for the covariate of education. Education level influences the success of the SHG in terms of continuity (Sharma, et al., 2014), in other words groups with more highly educated women tend to last longer. Secondly, people with higher education levels have higher propensity to save (Banks & Diamond, 2010) (Pirtillä & Suoniemi, 2014) (Gordon & Kopczuk, 2014). Due to the fact that the women are minimally 18 upon joining, most of their education has been completed by then.⁷ Therefore the treatment cannot influence the level of education of the women.

To conclude, all criteria to use PSM as an estimation method hold except for the conditional independence consumption. With the selected variables it is an appropriate method to be used in this case. Nonetheless, caution must be exercised when interpreting the estimation coefficients as causal effects.

⁷ Tertiary education includes junior college which is from the age of 16.

4.5.3. Instrumental Variables

As we have seen in the previous two paragraphs, an issue with this data is endogeneity of outcome and input variables. The reasoning behind the employment of the IV method is to circumvent the endogeneity problem. In order for the IV approach to yield a meaningful causal interpretation of the estimated effects two important conditions must be fulfilled. First, the employed instrument must be a meaningful predictor of the treatment variable. Secondly, the instrumental variable must be exogenous to the model (Angrist & Pischke, 2009). This section discusses whether these conditions hold in this case.

The IV used to predict length of membership is the village the women are resident to. As can be seen in table 4, compared to women in Kunjirwadi, women living in Koregaon Mul, Urulikanchan and Boriandi have substantially, and statistically significant, longer membership periods. Therefore the first condition holds.

	Coefficient
Koregaon Mul	-3.45*** (0.72)
Urulikanchan	-3.39*** (0.46)
Boriandi	-1.33** (0.54)
Kunjirwadi	0.00

*Table 4: Regression of years of membership on the village of residence in order to determine whether village of residence is a meaningful instrumental variable. Due to the gap in the data (2010-2014) only the groups established between 2000-2010 are used for this analysis. Standard errors are displayed in brackets after the coefficient. ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.*

The next notion to be tested is whether the village of residence is exogenous to the model. On the one hand the village of residence is determined before the participation decision. Therefore, there cannot be the case of reversed causality. Moving between the villages is uncommon and women tend to join the SHG after they have moved to the village: of the 444 women interviewed only 10 moved to their current village after joining the SHG.

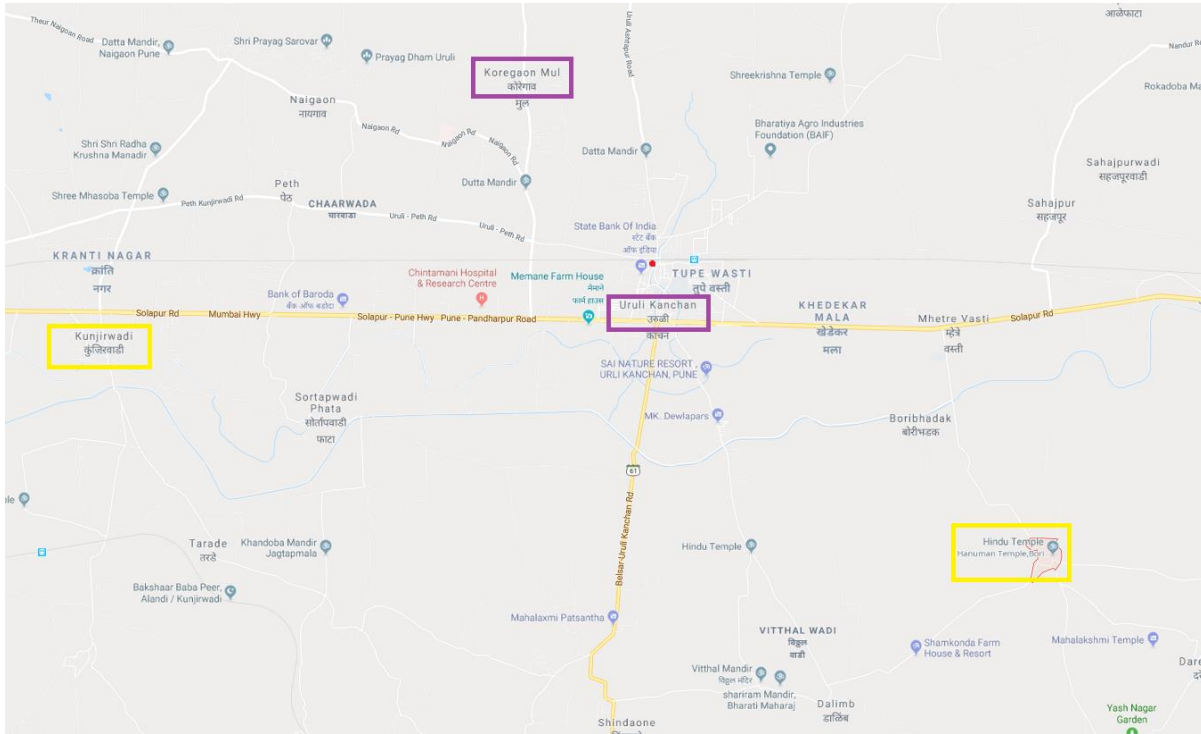


Figure 2: A close – up of the Area with the 4 villages.

Red dot: CHRC

Purple outline: villages with ‘new’ groups

Yellow outline: villages with ‘old’ groups

A possible explanation for why these villages have ‘older’ groups is the distance to the CHRC. There is currently a lot of pressure from both BAIF’s management and the Indian government to form a lot of groups. Running groups closer to home is a lot easier and so most new groups are formed in Urulikanchan (village where BAIF is). Not only that, as Urulikanchan has a population of 25,000 people it is a lot easier to find women to join than in the other 3 villages. This could then explain why the newest groups were created more closely to home. Another explanation could be that the groups created closer to home survived longer because it is easier to manage them. This is supported by the fact that in the villages the furthest away from CHRC a lot of groups have resumed their activities.

Whether the village of residence is truly exogenous to the model can be tested using the available background statistics. If it is truly exogenous, then the villages and the women should be similar on all other visible characteristics. Unfortunately, on the basis of table 5 and 6 we cannot conclude that this is the case.

Means to compare	Control	Treatment	Difference in Means
Percentage of population that is female	47.8%	47.3%	0.5%
Percentage of population that is a child between the ages of 0 and 6	13.2%	12.3%	0.9%
Percentage of female population that is of backward class	9.6%	6.9%	2.8%
Female literacy	76.5%	74.0%	2.5%
Employment rate	46.0%	51.5%	-5.5%
Female employment rate	33.2%	42.3%	-9.1%
Distance from BAIF	2.15 km	6.75 km	-4.6 km

Table 5: Compares the treatment (villages with old groups) with control (villages with new groups) on the basis of available trend data (Source: Indian Population Census 2011 available at < <http://www.census2011.co.in/> >). ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively. ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.

In table 5 we also see that there are differences between the villages in the number of women in backward classes, literacy rates and unemployment rates. When we use the data collected, displayed in table 6, from the SHG members these findings hold. In both cases we see that women of lower castes live in the villages with relatively old groups and employment is higher in those villages. Also, we see that women living in the villages with relatively new groups are more highly educated. Though we do not see a difference in literacy rates for the SHG members that is statistically significant. The higher level of education of women residing in villages with relatively new groups could explain these difference in overall literacy rates.

To conclude, there may be reason to believe that village of residence is exogenous to the model: the membership decision is after the residence decision. On the basis of the background information I cannot conclude that the instrument is perfect. There may be omitted variables that drive both decisions.

4.5.4 Conclusion

All in all, with the data at hand, it is not easy to employ an econometric method that perfectly disentangles the causal effect and selection-bias. Each of the methods used have their disadvantages. Accordingly, it is important to practice caution when interpreting the results displayed in the next section, there is little guarantee that they can be interpreted as causal effects.

	Control	Treatment	Difference
Age	42.44	41.28	1.16
Religion			
Buddhism	5.08%	0.00%	5.08%
Muslim	5.65%	2.15%	-1.59%
Hindu	93.22%	97.85%	4.63%
Other	1.13%	0.00%	1.13%
Caste			
General Class	69.09%	67.03%	2.06%
Other Backward Class	21.82%	32.97%	-11.15% **
Backward Class	9.09%	0.00%	9.09% ***
Education			
Literacy Rate	80.11%	71.91%	8.20%
No Education	15.11%	21.74%	-6.62%
Primary Education	9.88%	18.49%	-8.59% **
Secondary Education	54.07%	48.91%	5.16%
Tertiary Education	20.93%	10.87%	10.06% **
Household			
Married	86.21%	86.81%	0.61%
Children	2.34	2.33	0.01
Household size	5.55	5.57	-0.02
Unemployment			
Unemployed	23.16%	1.08%	22.09% ***
Unemployed Husband	2.82%	2.15%	0.67%
Number of women	296	147	

Table 6: Comparison of Descriptive Statistics Between Treatment (Villages with Old Groups) and Control (Villages with New Groups). Due to the gap in the data (2010-2014) only the groups established between 2000-2010 are used for this analysis. ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.

5. Results

The most noteworthy result is the consistent positive effect of the length of membership on the savings rate. Tables 7, 8 and 9 show that no matter which estimation method is used, the positive effect on the rate of total savings as a percentage of income is positive and statistically significant at the 0.01 level. Not only does this show robustness of the result, the result itself is a meaningful one when discerning the mechanisms at work with SHG membership as a savings vehicle.

we would have seen that only the SHG savings increase across the length of membership we can conclude that SHG membership is a successful commitment savings product. A higher absolute

level of SHG savings indicate that the SHG membership is effective in demanding compliance in savings from its members. Each year in an SHG means more monthly meetings and therefore more moments to save. Naturally, if compliance is high, this leads to higher absolute savings at the SHG. We see this pattern in three of the four employed methods (OLS per year, OLS with old groups as a dummy variable and PSM comparing old and young groups): the longer the membership the higher average savings at the SHG, with an average of around ₹1000 a year.

Effect per year of SHG Membership				
Clustered OLS				
Dependent variables	Mean	No Controls	Controls	Diff at Mean
Savings in SHG	10624	987.74*** (83.17)	1010.5*** (86.56)	10%
Savings in the Bank	5453	137.15	143.63	
Savings in Cash	1850	195.68* (102.87)	243.03* (129.79)	13%
Savings Total	17402	1122.45*** (268.44)	1304.65*** (253.86)	7%
Savings Rate SHG	5.04%	0.10%	0.06%	
Savings Rate Total	19.89%	1.38%***	1.53%***	8%
Gold	28.77	0.69	0.438	
Saris	26.72	0.64	0.79** (0.40)	3%
Chicken	3.45	0.09	0.258	
Goats	0.17	-0.02	-0.02** (0.01)	-13%
Cows	0.26	0.01	0.017	
Financial Control	2.64	0.03**	0.02* (0.01)	1%

Table 7: Effect per year of SHG Membership, estimated using Clustered OLS. Standard errors are displayed in brackets after the coefficient. One woman who owned 5000 chickens was removed from the sample (this was a substantially large outlier). Savings Rates that were larger than 100% were also removed from the sample as it is highly likely that this is mostly due to a misreporting of income. Used controls: education, literacy, age, number of children, size of the household, religion, caste and village of residence. Clustered standard errors are displayed in the brackets after the coefficient for those coefficients that are statistically significant. ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.

However, this would not constitute an increase in actual savings if there was some sort of a substitution effect. If it is the case that women are merely shifting their bank or cash savings to the SHG, or selling their assets and livestock in order to save at the SHG then we could not conclude that SHGs are an attractive savings vehicle for the poor. Fortunately, no such effect is seen. In fact, we see a statistically significant increase in cash savings across all estimation methods and an increase in bank savings for two out of four. For assets we see an increase in the number of saris over the length of membership for three out of the four methods, for gold this result is only found for two out of four. As for livestock, we see a slight positive effect on cow ownership when

comparing women in old groups with women in young groups. The results on goat ownership are ambiguous. When looking at the yearly effect and the comparison of women in old and young groups (but only when using OLS) we see a slight decrease in goat ownership. When instrumenting the years of membership we see a slight increase. Nonetheless, based on these results it is at least unlikely that there are substitution effects at play and it is likely that SHG membership offers an alternative method of savings with less barriers to savings for the poor.

Treatment (Groups established 2000-2010) vs. Control (Groups Established 2000-2010)						
Dependent variables	Mean	Clustered OLS			Propensity Score Matching	
		No Controls	Controls	Diff at Mean	Controls	Diff at Mean
Savings in SHG	10624	12380.05***(601.61)	12163.00***(571.80)	114%	12415.68***(240.28)	117%
Savings in the Bank	5453	4036.24**(1580.44)	4153.93***(1365.43)	76%	3362.74***(1153.83)	62%
Savings in Cash	1850	1920.4***(1920.40)	2306.68**(2306.68)	125%	1839.50***(456.01)	99%
Savings Total	17402	17315.72***(1926.41)	17999.61***(2059.66)	103%	16955.81***(1641.63)	97%
Savings Rate SHG	5.04%	2.17%	1.89%		3.24%***(0.91%)	65%
Savings Rate Total	19.89%	18.02%***(0.02)	19.46%***(0.03)	98%	20.70%***(1.70%)	104%
Gold	28.77	14.39**(5.52)	12.70211**(7.17)	44%	18.03**(0.03)	63%
Saris	26.72	6.01	8.216**(4.20)	31%	7.09**(0.02)	27%
Chicken	3.45	4.74	7.42		7.88	
Goats	0.17	-0.22	-0.21**(0.12)	-127%	-0.15	
Cows	0.26	0.23**(0.10)	0.32**(0.32)	123%	0.34***(0.09)	128%
Financial Control	2.64	0.235	0.16		0.35***(0.11)	13%

Table 8: Effect of Treatment, estimated using Clustered OLS and Propensity Score Matching; with groups established between 2000-2010 as a dummy variable for treatment. To see the pure effect of the year of established on which the treatment variable is based, the women who joined those groups in later years were removed from the sample. One woman who owned 5000 chickens was removed from the sample (this was a substantially large outlier). Savings Rates that were larger than 100% were also removed from the sample as it is highly likely that this is mostly due to a misreporting of income. Used controls: education, literacy, age, number of children, size of the household, religion, caste and village of residence. Standard errors are displayed in brackets after the coefficient. ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.

Though already an interesting finding, the results of this analysis in fact say much more. Not only can we likely conclude that SHG membership is a genuinely successful alternative method of savings for the poor, it is also one that encourages savings over time. Due to the robust increase in the total rate of savings, the SHG somehow manages to encourage women to save more than the year before. We saw when developing the conceptual framework that some of the barriers the poor face when saving are static: social constraints, transaction costs, present-day bias. Tackling these barriers by joining an SHG would merely encourage saving, it would however not encourage more saving over time. Transaction costs, social constraints and present-day bias are likely to remain the

same. Other barriers are however dynamic: lack of trust, low financial literacy, underestimation of compound interest and inattention to savings as a means to solve problems. Tackling these issues is a learning process and would therefore explain the increase in the savings rate over time.

Over time, the women in the SHG learn financial accounting (either orally or on paper), see their earnings grow through the interest earned on loans, learn to trust each other through repetitive interaction, are constantly reminded of the positive effects of saving (being able to pay for irregular and bigger expenses) they are constantly confronted with the positive effects of saving. In turn this learning mechanism could be the one at play that causes women to save more each year than they did the year before.

Treatment (Villages with Old Groups) vs. Control (Villages with New Groups)				
Instrumental Variables				
Dependent variables	Mean	No Controls	With Controls	Diff at Mean
Savings in SHG	14377	100.22	204.04	
Savings in the Bank	6647	-1153.73	-1356.1	
Savings in Cash	2487	651.59	1076.31** (628.88)	43%
Savings Total	22538	-1270.37	-1118.54	
Savings Rate SHG	6%	-0.64%	-0.80%	
Savings Rate Total	25%	2.92%*** (0.96%)	2.69%*** (1.12%)	11%
Gold	33.83	-0.23	1.37	
Saris	28.81	-0.20	-1.24	
Chicken	5.14	-1.76	-4.49	
Goats	0.09	0.06** (0.02)	0.06** (0.03)	70%
Cows	0.33	0.13** (0.06)	0.01	
Financial Control	2.72	0.02	-0.05	

Table 9: Effect of Treatment, estimated through using village of residence as Instrumental Variable. Due to the gap in the data (2010-2014) only the groups established between 2000-2010 are used for this analysis. One woman who owned 5000 chickens was removed from the sample (this was a substantially large outlier). Savings Rates that were larger than 100% were also removed from the sample as it is highly likely that this is mostly due to a misreporting of income. Used controls: education, literacy, age, number of children, size of the household, religion and caste. Standard errors are displayed in brackets after the coefficient. ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.

There is another conclusion that can be drawn based on the fact that the total savings rate as a percentage of income increases over time. For this to occur either income or savings need to increase. Table 10 shows that there is no statistically significant difference in yearly income between the women in the older groups and the women in younger groups. There is however a clear difference between the level of savings (as is also shown in the estimations represented in table 8). On the basis of logical reasoning I therefore conclude that, even though the results for

levels of savings are not statistically significant for all methods of estimation, an increase in savings rate over time would be impossible without a similar increase in total levels of savings. To draw a conclusion on the first hypothesis posed in this thesis: the length of SHG membership has a positive effect on a woman's savings: both in absolute levels and the savings rate.

Variable	Control	Treatment	Difference in Means
Yearly Income	121992	124174.1	-2181.73
Savings at SHG	1996.9	14376.95	-12380.05***
Savings Total	5222.39	22538.1	-17315.72***

Table 10: difference in outcome means between women in old groups (2000-2010) and new groups (2025-2016). ***, **, * is statistical significance at the 0.01, 0.05 and 0.10 levels respectively.

Whether women also experience a higher level of financial control due to SHG membership asks for a more tentative interpretation of the results. Two of the four estimation methods show slight increases in financial control. The financial control score is constructed in such a manner that the women can score a maximum of 5 points on the basis of her answer to three questions:

- Do you save your own income at the SHG (or your family money)?
- Who decides whether or not to apply for a loan at the SHG (you, you together with your husband, your husband without you)?
- Who decides what the loan at the SHG is to be used for (you, you together with your husband, your husband without you)?

One point is received when the woman saves her own income instead of her family's income. Thereby assuming that one inherently has more control over own earnings instead of shared earnings based on intra-household bargaining (Browning & Chiappori, 1998). Two points are awarded if the woman can decide by herself, without the husband's consent, whether or not to apply for a loan and what it is used for. If they decide together then one point is awarded. In the cases that the relationship is estimated to be statistically significant, we see an increase in score of either 0.02 per year or 0.35 from control to treatment group. This does not even come close to entailing a true shift in decision power (at least 1 point difference would be necessary for that).

There are several possible explanations as to why an increase in control over the SHG finances is not seen. First, the average control is relatively high: a score of 2.64. In other words, most women have at least shared decision making power over what happens with the money saved at the SHG. Asking of the women to do better on this score would entail that the husband has no influence at

all. It is not necessarily strange to think that a man and wife decide together what is done with the family's finances. The first explanation is therefore that the women in this sample are already at the socially desirable maximum decision power.

Based on this argument, one could also argue that it is not the length of membership that would increase financial control, but membership itself. To put it differently, what if joining an SHG is what boosts financial control, not the number of years a woman is a member of one. There is no way to test this question based on the findings at hand. The women in the control group had never been a member for longer than a year. As it is my experience that it takes quite a bit of work to get an SHG functioning, I doubt whether this could be the case. Either way, this is definitely an interesting question to be examined in future research.

Another explanation finds its backing in the studies done looking at the effect of microcredit on a woman's financial control. Those studies looking at the amount of knowledge women had over the loans, the decision power, and who managed the finances tend to conclude that sending the women to the microcredit cooperative is merely a means to an end. There explanation is then that offering the credit to women does not lead to 'empowerment' if the women are not the ones actually controlling the financial decisions (Kabeer, 2001).

On the contrary, a lack of positive effect does not necessarily mean the women are being used as a means to an end in the case of SHGs. Firstly, the average financial control at least indicates some influence. Secondly, there are reasons to believe that in the case of SHGs it is more difficult, as compared to microcredit, to ignore women's decision-making power. It is the women the women in the group, and not the Bank, that make the financial decisions and monitor the loan. Even so, the measure for financial control is rather crude in this study. We do not know how much influence the women have when deciding on the loan application. That the choice is made together could mean equal input, but could also mean a mere hearing of opinion. Further research is necessary to disentangle these possible causes of the level of financial control.

A last, and possibly the most likely reason is that these results include a lot of bias and unreliability. As discussed in section 4.3, bias could lead to both an over- and underestimation of the effects in this case. It could be the case these contradicting biases level out, it could be the case that only women with a high relative financial control join SHGs. Another possibility is that women has experienced such socio-economic development that the young women joining today inherently

have more financial control than the women who joined two decades ago. As this study is not capable of disentangling these possible directions of bias we cannot know.

Based on all this, and on the fact that financial control is only very slightly positive with two of the four estimation methods, I cannot conclude that length of SHG membership unambiguously increases a woman's control over her finances.

6. Conclusion and Recommendations

This thesis has attempted to contribute to the academic literature and the development policy debate by answering the question of whether Self-Help Groups can constitute an effective tool in increasing rural women's savings and financial control. Based on the findings of this study I conclude that there are strong indications that Self-Help Groups are extremely effective in both providing an alternative savings vehicle and encouraging an increase of savings over time.

The first result, that Self-Help Groups can provide a vehicle of savings so that the poor can save what they would like to save but do not due to barriers such as present-day bias, high transaction costs and social constraints is supported by the studies conducted on similar savings products. It has been found in other studies that commitment savings products can tackle the present-day bias and thereby increase savings (Shefrin and Thaler, 1988; Ashraf, Karlan & Yin, 2006; 2010; Brune et al, 2011; Dupas and Robinson 2013b). Making it either extremely difficult to withdraw savings or not making the level of savings public information can tackle social constraints (Plateau, 2000; Baland et al, 2012; Giné et al, 2017). Lastly, Self-Help Groups constitute much lower transaction costs; financial and otherwise.

The second finding, that Self-Help Groups can also encourage an increase in savings rates over time can be theoretically underpinned but has so far not been found in other studies. The theoretical underpinnings come from the barriers to savings such as under-estimation of compound interest, lack of recognition of savings as an effective manner to solve problems, low trust and low financial literacy (Karlan, Ratan, & Zinman, 2014). The way Self-Help Groups are operated can result in a decrease of these barriers over time: women learn to trust each other, are constantly reminded of the advantages of savings as means of solving problems, see their savings grow with interest and an increase in financial literacy due to the trainings offered.

On the other hand, based on the presented results it cannot be concluded that Self-Help Groups are an effective tool in increasing women's control over finances. This finding is similar to the

results found in studies on microcredit (Kabeer, 2001). There are many possible reasons that could explain this finding: high initial level of financial control, the increase is experienced at the moment of joining, opening the group only to women does not necessarily have to mean they control what happens, the incapability of this data to ascertain how much influence women have in the shared decision and of course the many concerns for bias due to the nature of this study. It is up to future research to attempt to determine what the exact mechanism that is at play in the relationship between financial control and membership to a Self-Help Group.

Based on these findings, governments and NGO's could certainly offer Self-Help Groups in rural communities as an alternative method of savings and for one that has the hopes of raising the population's propensity to save. Bearing in mind that savings have been shown to drive both individual socio-economic development (Prinia, 2017) and macro-economic growth (Karlan, Ratan, & Zinman, 2014), this is certainly a meaningful policy goal to strive for.

In spite of this, Self-Help Groups should not be considered as a policy tool that is capable of tackling all problems in rural societies in developing countries. This thesis cannot conclude that women who are an SHG member experience an increase in control over finances over time. This is unfortunate as financial assets and the level of control a woman has over them are an important factor in determining intra-household bargaining power (Browning & Chiappori, 1998). Moreover, the argument that money supplied to women will increase household spending in favour of the family and thereby propelling societal change (Armendáriz & Morduch, 2010) has no meaning if the women have no or limited control over that money. In this light, and considering the limitations of this thesis, it is wise for governments and NGO's attempting to tackle these issues to employ Self-Help Groups as a means of driving female empowerment and thereby societal change to do so with caution.

Nonetheless, Self-Help Groups are now widespread practice in developing countries, especially in India. Therefore, I suggest to future researchers on the topic to conduct a Randomized Controlled Trial. Due to the random and mostly vague policy decisions, unreliability and non-existence of back-ground data is it rather difficult to determine causal effect on data concerning Self-Help Groups. A Randomized Controlled Trial can tackle all these issues.

7. Limitations

In section 4 I already discussed a lot of the limitations of this paper. First, there are extensive concerns for supply- and demand side bias. I have done my best in controlling for these biases with the econometric techniques and controlling for every observable variable. However, the descriptive statistics clearly show that the treatment and control groups are not sufficiently similar to ensure that the only difference between them is the length of SHG membership. These differences also make it impossible to exclude the notion that there are no unobserved variables that could be driving the outcomes. The estimation methods used can measure causal effect if all their underlying conditions hold. However, in all the cases there are concerns as to whether the independent variable is truly exogenous to the model. To err on the side of caution, interpret the results as correlation and not causation. Whether we are also dealing with causation is up to future research to determine.

Secondly, the sample is not representative of the Indian population. It is also not selected randomly from the SHG member population. As there is no other reliable background information on the SHG members I cannot check how this sample compares to the rest of the population. In any case, the results must be interpreted with care.

Third, this study was conducted in the 3 months after the implementation of Prime Minister Modi's demonetisation policy. There were enormous cash constraints and it influenced the women severely. More than half the women stated they had experienced problems due to the ban. In light of this issue, whether cash savings are a true representation of the 'normal' situation is doubtful. Either all has been deposited into the bank; otherwise its no longer worth something. Or, the women have kept it longer because accessing banks to exchange the money was almost impossible in the first two months of the study period.

Fourth, it is rather likely that the data is rather unreliable. Even when the information was readily available, 14% of the women managed to misrepresent their savings at the SHG. Though I corrected this, it does not promise high reliability for the rest of the data, as that could not even be verified. Considering that there were numerous circumstances where I suspected women of giving socially desirable answers. For example, all most all women have filled in that they earn ₹5.000 or ₹10.000 a year more now than when they joined the SHG. This was irrespective of how long they have been in the SHG or whether there is any reason to believe that their productivity had actually increased and even less reason to believe that if there was an increase in productivity this would be due to

loans from the SHG. Almost all women reported this incremental difference, whilst only 22 women out of 444 actually owned a business whereby investment could actually lead to higher income.

In Indian culture, not answering the question someone asks you is not an option. This could mean that women made up an answer if they did not actually know. And I even caught my translator on occasion suggestively steering women towards an answer. When I spoke to her about it afterwards she assured me that this would be necessary, otherwise there would be no answer at all.

A last issue with the reliability of the data in their capability of representing the true situation was the unreluctance of the women to disclose in some cases. This concern was brought up especially when answering the question of how much gold they owned. There were a lot of jokes about whether Prime Minister Modi was planning on taking that as well. Moreover, women were scared that this information would attract thieves.

In conclusion, apart from the issues of bias and limitations to generalisation of the result due to concern for the level of representativeness of the general Indian population, there are also serious reasons to doubt the reliability of the data. Because of all this, it is impossible to guarantee that the results presented in this paper are causal effects that represent the true situation. I have done my best to compensate for any short-comings. But controls and econometric methods can only take the data so far. As repeated numerous times in this paper, caution must be practiced when interpreting and generalising these results.

8. Discussion

Conducting this research raised some interesting questions. First, like many programmes of its kind, I have my doubts whether the SHG programme manages to access the poorest of the poor (Hulme, 2000; Navajas et al, 2000; Mohapatra and Sahoo, 2016). In the comparison with the general Indian population we see that the employment rates of our sample are higher, there are relatively more Hindu's and relatively more women of a higher caste. Apart from that, we also see that the more rural or further away the village is from the CHRC the more likely that the SHG groups were discontinued. When asked about this BAI's staff also reply that the women that live in those villages are too backward to see the advantages of SHG membership. Thereby confirming the idea that the programme does not provide financial inclusion to those at the very bottom or margin of society. This does not draw attention away from the work they are doing, but is perhaps

an interesting notion for further research. What is the mechanism at play and can something be done to change that?

The other questions that the fieldwork raised were along the lines of whether the SHG programme was being used to its full potential. For example, could these savings act as a sort of pension product. The latter thought was triggered when I spoke to a destitute woman who had been left by her husband and whose children hardly spoke to her, much less provided for her. She was too old to work and her livelihood depended on the altruism of her SHG group and occasionally of village members. With ₹38,000 in savings at the SHG I started to wonder why that money was not being used to sustain her. It was certainly not something the women had considered themselves. The money was to remain at the SHG. The woman could not loan from the group because she had no income and therefore no means to repay the loan. Would the only way to withdraw the money be to withdraw from the group? On this notion, I started to wonder what would happen with the money if the woman passed away. Though the programme has been running for 20 years, such questions had not been answered simply because those bridges had not been crossed. In traditional Indian manner, problems of the future do not constitute problems.

Carrying this argument further, it is questionable whether savings as such, without being able to withdraw them, are enough to drive socio-economic development. Clearly, if the woman has an income she can use the SHG as a consumption smoothing mechanism: borrow money to pay for a big expense and then pay it back as a percentage of income. Especially since not all groups are connected to bank accounts, what good is all that money doing sitting around? An idea would be that apart from loans, part of the savings could be used to pay for future big expenses, without the necessity of paying back the money to group. This would result in a more dynamic use of the SHG product.

These are just some considerations that could be applied when trying to improve the SHG product. They are certainly interesting to think about and they raise some questions of whether the SHG mechanism is being used to its full potential.

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