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## Introduction

Domestic violence (DV) continues to rise despite being widely recognized as a serious human rights abuse, and a public health problem. DV includes any acts of violence conducted on individuals within a household, such as between spouses, siblings or parents and children, and often women are the victims relative to men (WHO, 2021). Globally, 1 out of every 3 women (30%) suffers physical and sexual domestic violence, and 38% of female murder cases result from intimate partner domestic violence (WHO, 2021). The situation is more pervasive in fragile states, which are countries that also receive inadequate attention in research that uncovers ways to reduce domestic violence. Therefore, this study focuses on Intimate Partner Domestic Violence (IPDV) in a fragile state.

The 2015 Sustainable Development Goals (SDGs) recognise DV as one of the ills that requires redress by setting a target to eliminate all forms of violence against women by the year 2030 (United Nations, 2015). In support for this target, all member countries, aim to improve and work towards decreasing the prevalence of violence against women (García-Moreno & Avni, 2016). Hence, a better understanding of the interventions that can reduce DV, especially in countries with high prevalence, is more necessary now than before. Results from such investigations assist stakeholders to design appropriate and effective policy responses to the high domestic violence act.

The incidence of intimate partner domestic violence, hereafter referred to as domestic violence, varies globally and at the continental level. The DV ranges from 20% to 25 % across the Western Pacific high-income regions of Europe and the Americas, and from 31% to 33% in the lower-income regions of Eastern Mediterranean, South-East Asia and Africa (WHO, 2021). Africa ranks high on DV amongst the low income countries, and the incidence is highest in the western region of the continent, particularly in post-conflict states (Manjoo & McRaith, 2011). In Sierra Leone, about 250,000 women and girls suffered forms of DV, through rape, sexual slavery or forced marriage during the country's 11-year civil war from 1991 to 2002 (Denney & Ibrahim, 2012). Most recently, the 2019 Sierra Leone Demographic Health Survey reported an increase in the number of women who experienced physical violence by anyone since age 15, from 56% in 2013 to 61% in 2019 (Statistics, 2019).

While Sierra's domestic violence cuts across many societal divides, prevalence rates are higher among vulnerable groups such as uneducated women, who are often more dependent on their

husbands for resources (Denney & Ibrahim, 2012). Consequently, the last two decades have seen a proliferation of programs focused on empowering women through increased access to microfinance services such as savings and credit, to reverse the trends (Cornish, Walls, Ndirangu, *et al.*, 2021). Nevertheless, most women in Sierra Leone still lack access to formal credit facilities (ACET, 2019). This leads to their increased usage of informal financing channels, particularly rotation savings and village loans known as *Osusu*. The *Osusu* scheme provides for over 50% of the informal microfinance service for the general population (Statistics Sierra Leone, 2019) while ushering business startup capital for 12% of the country's women (Cherie Blair Foundation, 2014). Notwithstanding the wide coverage of *Osusu* microcredit facilities, studies are yet to establish the impact of the schemes on domestic violence. Furthermore, one can hardly extrapolate results found in similar micro-credit programs in other countries to the *Osusu* because consensus on the topic in the broader literature is non-existent.

The existing evidence supports two opposing hypotheses- the family bargaining and the men's backlash theories. Proponents of family bargaining argue that economic empowerment allows women to contribute to family financing substantially and enables them to become less dependent on their husbands (Chin, 2011). Such women are respected and treated better by the husbands, leading to a reduction in domestic violence (McElroy, 1990; McElroy & Horney, 1981). Findings from existing literature (Duvendack & Mader, 2018, 2020; Gibbs, Jacobson & Kerr Wilson, 2017; Kinyondo & Joseph, 2021) support this assertion and show that participation in microfinance such as village savings loans reduces intimate partner violence. Economic empowerment is the main transmission mechanism through which this relationship operates. Moreover, Buller *et al.* (2018) reveal that domestic violence occurs in a context of conflict over the disposal of limited resources where there are competing needs across genders.

The proponents of men's backlash theory, on the other hand, argue that the economic empowerment of women leads to increased domestic violence (Aizer, 2010; Luke & Munshi, 2011). Women who contribute substantially to household needs reverse men's traditional role as breadwinners (Chin, 2012). Men, compensate for their reduction in relative bargaining power using violence (Girard, 2009). Literature for this school of thought finds supporting evidence that women's participation in microfinance leads to increased violence against women (Koenig, Ahmed, Hossain, *et al.*, 2003; Schuler, Hashemi & Badal, 1998).

The differences in the effects of microcredit on domestic violence could suggest that context matters. Much of the evidence on the subject originates from Asia (Angelucci, Karl & Zinman, 2018; Bajracharya & Amin, 2013; Chin, 2012; Schuler *et al.*, 1998). Only a handful of studies (Eze-Eze, 2019; Kajula, Balvanz, Kilonzo, *et al.*, 2016) have been conducted in sub-Saharan Africa, despite the region's well-known extensive growth in microcredit and highest rates of domestic violence, as alluded previously. Particularly, evidence is missing in sub-Saharan fragile states, here defined as a country with weak state legitimacy leaving citizens exposed to a range of shocks<sup>1</sup>, where there is significant market failure in formal institutions and financing is not exceptional (IFC, 2019; Luiz, Ganson & Wennmann, 2019; Mares, 2014). Microcredit, especially, village savings loan groups, would provide the much-needed cushion to women in these states. Moreover, under such extreme economic vulnerability, estimates from other non-fragile countries, even within the region, may not be comparable to those in the fragile states. Therefore, a study on the relationship between microcredit and domestic violence in fragile states is relevant.

This paper contributes to the domestic violence literature by examining the relationship between membership in a microcredit group and women's perception of domestic violence for a country in the top 50 fragile states in the World-Sierra Leone. The country is a compelling case study because it ranks high on domestic violence, and has an innovative microcredit scheme that could be reducing the violence. Further, most studies (Bajracharya & Amin, 2013; Kajula *et al.*, 2016; Tsai, Carlson, Aira, *et al.*, 2016) use non-nationally representative data to examine the topic because domestic violence and microcredit variables are often collected in different types of national surveys. Usually, domestic violence is in health surveys, while microcredit is in welfare surveys. Our paper further adds to the scholarly work by examining the topic using a compendium of data that we construct from two nationally representative surveys, the Multiple Indicator Cluster Survey (MICS) which asks a question on domestic violence and the Integrated Household Survey (ISH) that enquires on microfinance. We merge individual-level information on same women interviewed in both surveys. Further, most studies (Koenig *et al.*, 2003; Schuler *et al.*, 1998) that find no or positive relationship between microcredit and domestic violence use direct questions of whether a woman experienced domestic violence. Such questions are criticized for potential measurement errors from underreported violence as women fear revealing such acts (Mitra, Bang & Abbas, 2021). We

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<sup>1</sup> [www.countryeconomy.com](http://www.countryeconomy.com)

use an indirect measure of domestic violence-women's perception of whether they think it is justifiable for a man to beat his wife. The perception indicator allows us to evade mismeasuring impacts of interest,

While previous work (Eze-Eze, 2019; Kim, Watts, Hargreaves, *et al.*, 2016; Murshid, Akincigil & Zippay, 2016) examines the impact of microfinance on domestic violence by using aggregate measures of the violence, this paper explores heterogeneities. Arguably, disaggregation is important because various forms of domestic violence are embedded in and justified by traditional practices and norms differently. Consequently, the forms of violence could be responding to financial empowerment differently. Mitra, Bang and Abas (2021) support our hypothesis on heterogeneity-they show that remittances reduce acceptance of various forms of domestic violence with different magnitudes. Therefore, we analyse both aggregate acceptance of domestic violence, and domestic violence split by five different forms including the act of: beating a wife if; she goes out without telling the husband; neglects children; argues with the husband; refuses sex; or if she burns food.

Our results reveal that women's participation in a microfinance program called *Osusu* in Sierra Leone, negatively associates with women's perception of domestic violence in general, and positively associates with business ownership. The reduction in the justification of domestic violence is specific to household responsibilities such as beating a woman if she neglects children or burns food. However, the relationship is not the same for all forms of domestic violence. Particularly, there is no link between the *Osusu* and domestic violence that is classified as a personal responsibility to couples, such as beating if the woman goes out without telling the husband, argues with the husband, or refuses to have sex with him.

In section 2 that follow we describe the *Osusu* micro-credit initiative focusing on its implementation and discussing its potential to reduce domestic violence. Section 3 presents the data and method that the paper uses focussing on how overlapping households between two nationally represented households were used to answer our research question. Section 4 presents results for estimating the relationship between *Osusu* and acceptance of domestic violence, while section 5 discusses these results. Finally, section 6 concludes the paper.

### **The *Osusu* micro-finance**

The *Osusu*<sup>2</sup> approach to microfinance involves creating a group of twelve people who each contribute, for instance, about Leone (Le) 500,000 per month. At the end of the month, one member obtains a total of Le 6 million<sup>3</sup>. All members continue contributing for the subsequent months until everyone has their turn to receive the Le 6 million. When the first cycle is completed, the group may decide to continue or not. Members are also allowed to obtain loans in the scheme at an agreed interest rate. Unlike other microcredit initiatives that have strict payment modalities, *Osusu* members make contributions at any interval within the month. Thus, *Osusu* is more inclusive even to the poor who have irregular income patterns. At the marketplaces, collectors, commissioned by the *Osusu* group go around with motorbikes and ledger books to collect contributions from *Osusu* members. The collectors get paid by deducting an agreed upon amount from every member's contributions.

Apart from employing the collectors, *Osusu* is a considerable part of life of people in Sierra Leone, particularly amongst women who form the largest membership. Members use money obtained from the initiative to pay school fees, house rents, medical bills, and expand their micro-enterprises. The fact that *Osusu* provides enough capital for business expansion adds another uniqueness to it. Often, such income is little and is consumed in other microcredit programs (Easton-Calabria & Hakiza, 2021). Further, *Osusu* runs on minimized documentation and procedures involved in saving channels; members are only offered a card with a name and telephone number on it, showing how the contributions are collected.

The inclusiveness of *Osusu*, gives it the potential to reach out to most vulnerable women who often are also victims of domestic violence (Slabbert, 2017). Therefore, a special investigation of the relationship between membership in *Osusu* and acceptance of domestic violence in Sierra Leone is warranted.

## **Data and methods**

### *Study context*

The Republic of Sierra Leone is a country on the southwest coast of West Africa divided into five administrative regions that contain 16 districts. The republic is among 50 countries classified as fragile states (2017 Fragile States Index<sup>4</sup>). Conflict seems to pervade most of the country's history, including a number of military coups after independence and a history of

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<sup>2</sup> Also known as rotating savings and credit associations (ROSCAs)

<sup>3</sup> US\$ 587,55 as of 2021 at 10 212,50 Leone per dollar

<sup>4</sup> Fragile States Index 2017, <http://fundforpeace.org/fsi>, (22.06.2017).

social unrest that resulted in a brutal civil war that lasted for over a decade (Collier, Besley & Khan, 2018). Sierra Leone is amongst countries that implement Multiple Indicator Cluster Surveys (MICS) and the Integrated Household Surveys (IHS).

#### *Sierra Leone MICS 2018*

The Sierra Leone MICS is an initiative launched in collaboration with the United Nations Children Fund (UNICEF), to monitor the situation of women and children. The 6<sup>th</sup> round of the Sierra Leone MICS<sup>5</sup> was conducted in 2017 by the Statistics Sierra Leone (Stats SL) with technical support from UNICEF as part of the Global MICS Programme. This MICS is a two-stage sampling survey that randomly selected Enumeration Areas (EAs), then households within the selected EAs. The survey sampled 15,605 households and achieved a 99.6 percent, household level response rate. The survey collected detailed information that includes reproductive and maternal health, exposure to mass media, child health and nutrition development, and individual level responses to acceptance of domestic violence.

#### *Sierra Leone Integrated Household Survey 2018*

The Sierra Leone Integrated Household Survey (SLIHS) 2018<sup>6</sup>, forms part of a class of Living Standards Measurement Surveys (LSMS) that are conducted in countries with technical support from the World Bank. The SLIHS is implemented in order to monitor overall welfare changes and guide national development goals. The LSMS collect detailed information on incomes and expenditures that are key for monetary poverty assessment. They also collect data on education, health, employment, housing, household assets, entrepreneurship, and access to microcredit, at both household and individual levels. The survey used a two-stage sampling procedure, the first being selection of EAs then randomly sampling households within these areas. In total, the survey sampled 6840 households and attained a 100 percent response rate at both cluster and household and individual levels. The IHS collected data in 4 questionnaires: agriculture, consumption, household member characteristics and household characteristics. The household characteristics comprised a section with information on financial services containing questions that are specific to individual level membership to village savings loans group-*Osusu* and a statement of whether an individual owns a business.

#### *The sample*

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<sup>5</sup> The data can be found on <https://mics.unicef.org/surveys>

<sup>6</sup> Data can be found on <https://www.statistics.sl/index.php/sierra-leone-integrated-household-survey-slihs.html>

This paper combines data from the country's MICS and IHS, both conducted in Sierra Leone in 2017-18 using the 2015 Sierra Leone Population and Housing Census as a sampling distribution frame. Part of the IHS and the MICS surveys conducted interviews within the same households in 505 overlapping clusters allowing individuals to be inter-traced. This provides a unique set-up enabling evaluation of our question that uses the outcome "domestic violence" found in the MICS and "Osusu membership" a treatment that is captured in the IHS data. We merged the individuals that appeared in both IHS and MICS surveys using their unique identifiers. Our sample was limited to 2,948 married women that are of the age 15 to 49 and appear in both surveys.

### *Outcome variables*

This paper uses two outcome variables, domestic violence as the main dependent variable and business ownership, which is the transmission mechanism through which micro-finance impacts domestic violence. We capture both variables as binary with 1, for the affirmative response and 0 otherwise. Domestic violence is measured by a question that asks, "whether the woman thinks it is justifiable for a husband to beat a wife". The question is more practical in traditional settings, like the one under study, unlike the direct question of "whether one was beaten". This is because many traditions discourage women from reporting domestic violence as doing so is associated with shame of betraying marriage reputation, fear of retribution, the possibility of inviting further domestic violence and divorce (Thompson, Sitterle, Clay, *et al.*, 2010). The domestic violence question is further split into specific scenarios for justifying the beating, which includes when she: 1) goes out without telling him, 2) neglects children, 3) argues with him, 4) refuses to have sex with him, and v) burns food. The transmission mechanism is captured using the business ownership outcome, which is given as a question on whether one owns any type of business or not.

### *The treatment variable.*

The primary variable of interest is membership in *Osusu* captured as 1, for those who positively respond and 0, for those who report being non-members of *Osusu*. Therefore, we model the marginal effects of being a member of a village savings loans group rather than the effect of the actual savings made in the group. This is consistent with current practice (Mitra *et al.*, 2021). The measurement of actual savings in low-income countries that are identified with profound domestic violence, such as Sierra Leone is subject to substantial error, primarily amongst low-income households. In such settings, women often underreport their income to avoid

household conflicts emerging from the disruption of breadwinner roles (Roth & Slotwinski, 2020).

While one would be concerned that the treatment-Osusu-is found in the SLIHS conducted in 2018, and the outcome-domestic violence-in MICS conducted in 2017, the way the questions for the two variables were asked removes mistiming threats. The SLIHS asked whether one was a member of the Osusu in the last year (2017), while the MICS asked about the person's acceptance of domestic violence as of 2017. These data, though collected in adjacent years refer to the same reporting period.

### *Empirical strategy*

Consider a linear relationship and the following factors that may affect domestic violence for woman  $i$  in household  $j$  in Sierra Leone.

$$Domestic\ Violence_{ij} = \theta Osusu_{ij} + \beta X_{ij} + \varepsilon_{ij} \quad (1)$$

$$Business_{ij} = \theta Osusu_{ij} + \beta X_{ij} + \varepsilon_{ij} \quad (2)$$

$$\varepsilon_{it} = c_j + \mu_{ij} \quad (3)$$

*Domestic Violence* represents a binary outcome of whether the woman perceives that it is justifiable for a man to beat a woman. Participation in *Osusu* by a woman  $i$  is represented by  $Osusu_{ij}$ . The parameter  $\theta$  represents the relationship between *Osusu* and domestic violence. To understand the relationship between *Osusu* and business ownership, we estimate Equation (2) while replacing domestic violence with *Business* and  $\theta$  would represent the relationship between membership in *Osusu* and business ownership. In equations 1 and 2, the coefficient estimates and standards errors from  $\theta$  provide a measure of how becoming a member of *Osusu* affects the probability that a woman faces domestic violence or not, captured by her perceived acceptance of the domestic violence or her likelihood of owning a business, respectively.

The vectors of other covariates that affect domestic violence and are hypothesised to also affect business ownership are represented by  $X_{it}$ , while  $\beta$  captures the vector of corresponding parameters. The covariates could affect business in the opposite way relative to their effects on domestic violence. For instance, if a covariate makes a woman disempowered and susceptible to an increased probability of suffering domestic violence, the disempowered woman is also less likely to participate in businesses. Therefore, in the interest of brevity, we only explain the expected direction of the relationship between a covariate and domestic violence, and the opposite can be implied for business ownership.

These covariates include the age (that of the woman and her spouse). Younger women are more likely to perceive domestic violence as justifiable especially when married to older men, because a larger age gap reduces the woman's ability to influence decisions in the household (Crandall, VanderEnde, Cheong, *et al.*, 2016; Rotering & Bras, 2019). Children ever born to the woman is also included in the covariates. Women with more children could face domestic violence especially where anger and aggression are generated due to the inability of the family to cater for the family needs (Vyas & Watts, 2009). These women's perceptions could become more accepting of domestic violence with increased exposure to the violence. The woman's education level is also included; women with high education qualifications have increased bargaining power and are more likely to be respected in their households. As these women make an equal financial contribution to the households, they may not tolerate domestic violence relative to uneducated women (Vyas, Jansen, Heise, *et al.*, 2015). Exposure to the media (radio and TV) form part of the domestic violence covariates too. Women who access the media become enlightened about their rights and privileges (Keller, Wilkinson & Otjen, 2010). Arguably, the awareness makes them stand up against different forms of abuse. Further, we include the residence. Rural areas have strong traditions that often inhibit reporting domestic violence and lead to increased wife beating incidences (Lichtenstein & Johnson, 2009). Finally, wealth is included, split by quintiles, to account for all broader socio-economic differences that exist and may affect domestic violence between people differently. The error term  $\varepsilon_{it}$ , captures errors in estimation.

#### *Selection bias in Osusu membership and domestic violence*

In equations (1) and (2), the error terms  $\varepsilon_{it}$  have two components, as defined in equation (3). First component is household specific  $c_j$  and the second component is the assumed individual idiosyncratic error component. While we minimise the potential effects of individual differences confounding our *Osusu* estimates by including an extensive list of control variables in  $X$ , we remain with some possible confounders. This is particularly a problem because selection into *Osusu* may be non-random and influenced by other factors such as household collective decisions influenced by differing power balance between men and women that may also have a bearing on the outcomes. Thus, the decision-making process may simultaneously determine participation in *Osusu* and domestic violence or business ownership. Further, the decision-making process is a function of individual and household level heterogeneities between the observed couples and their comparison group. Formally, the observed effects of

*Osusu* are partly generated by unobservable factors in the error term. The coefficient of *Osusu* would then be over or underestimated.

To obtain a casual impact of *Osusu*, one needs to compare attitudes towards domestic violence between two women with the same probability to become members of *Osusu* in both observable and unobservable ways whose only difference is the actual membership to the *Osusu*. This will formally eliminate the selection into *Osusu* problem. Considering that this is observational data and the women we observe are from different households that could differ in attributes, such an experimental ideal cannot be easily attained without a randomized control trial.

Our response to the problem employs a Propensity Score Matching (PSM) estimator (Gertler, Martinez, Premand, Rawlings & Vermeersch, 2011; Khandker, Koolwal & Samad, 2009; Mitra *et al.*, 2021), which provides the effects of interest under the Conditional Independence Assumption (CIA); factors that affect *Osusu* membership are perfectly observable. We, therefore, match each woman who is an *Osusu* member one-to-one with a demographically similar woman who is not an *Osusu* member. In the minimum, the matching estimator balances characteristics between the treated (*Osusu*) and the control (non-*Osusu*) in a similar way as if the women and the households they represent were randomly assigned between the treatment and control groups. This allows pairwise comparison of closely comparable women who only differ by their membership to *Osusu*. We match these two categories using the same variables that we use in Equation (1) as the covariates for Domestic violence. Besides, violation of CIA assumption due to differences on unobservable factors is possible in observational data. Therefore, we limit the interpretation of our results to associations but not implying strict causality.

Estimation of the results employed the PSM. We, however, began first estimating a “naïve” logit relationship as a benchmark before the PSM. The logit shows intent to treat. Nevertheless, caution should be exercised in comparing the coefficients from the two methods. This is because the logit uses a parametric approach, whereas the PSM is non-parametric. The signs and significance of coefficients from the methods are therefore more important in the comparison.

## **Results**

Although our interest lies in understanding the effects of membership in *Osusu* on a woman’s perceptions of domestic violence, the paper begins the empirical results section by validating

the effectiveness of the matching method. Thereafter, we present summary statistics for all variables used in the study and the difference in means between the treated and control groups before and after matching. Finally, we present empirical findings obtained from estimating Equation 1.

*The propensity scores matching diagnostic results.*

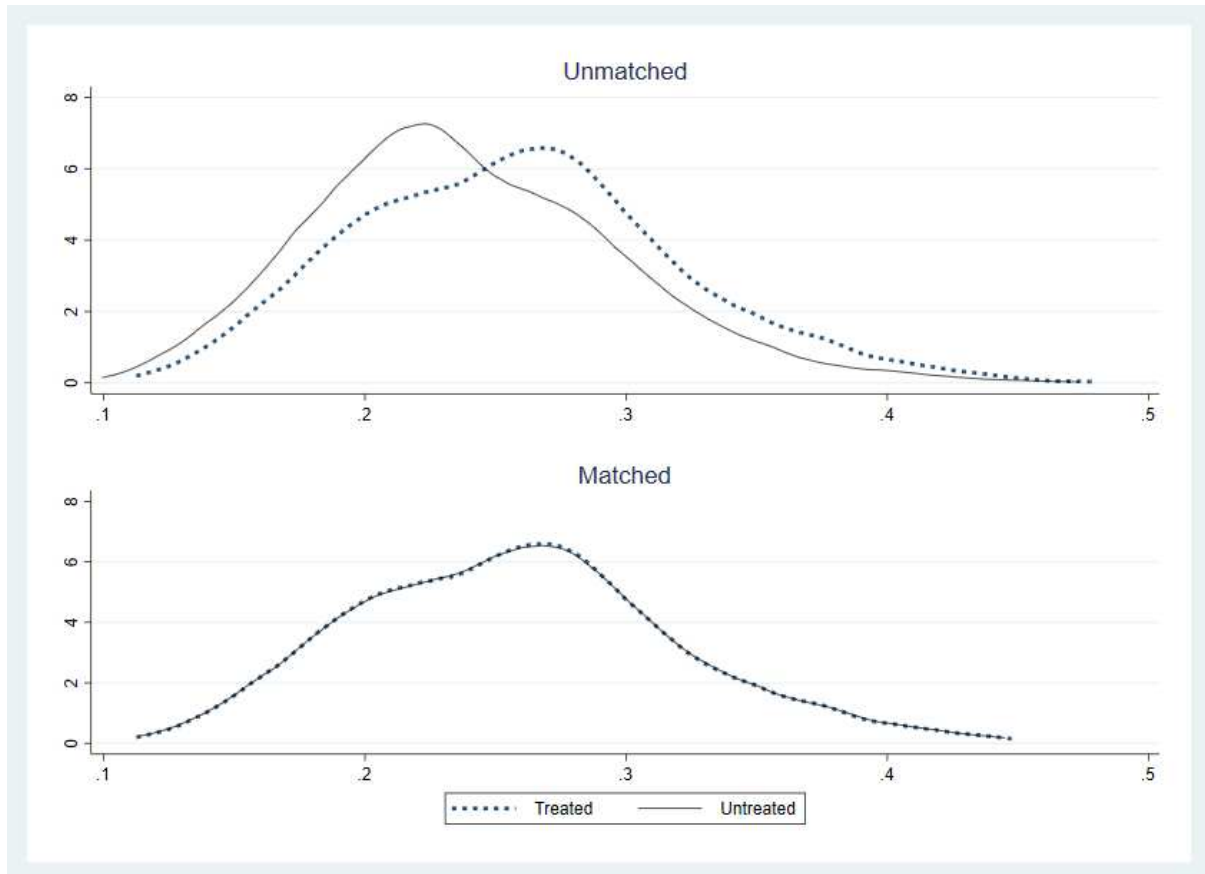


Figure 1: The distribution of propensity scores before and after matching

Figure 1 presents plots for the distribution of propensity scores generated through the propensity matching estimator. The top panel shows the distribution plotted before matching, while the bottom panel shows the distribution after matching. In both panels, the solid line captures the propensity score distribution for non-*Osusu* women (Untreated) while the dotted line shows the *Osusu* women (treated). The first panels confirm there existed adequate overlap between the two groups; the larger section of the distribution contains intersecting women irrespective of their treatment status. The bottom panel confirms that matching reweights the distribution of propensity scores to make them similar. Thus, the covariates of *Osusu* membership are now projected as if the only visible difference between the treated and the control groups is the treatment.

Figure 2 cements overlap evidence showed in Figure 1 by displaying proportions of the treated and untreated on and off common support. The results remain satisfactory that most of our subjects' propensity scores, shows by the black (treated) and white (untreated) are within the region of common support. Only a few of these are outside the region. This provides evidence that the propensity score matching estimator produces reliable estimates in this dataset.

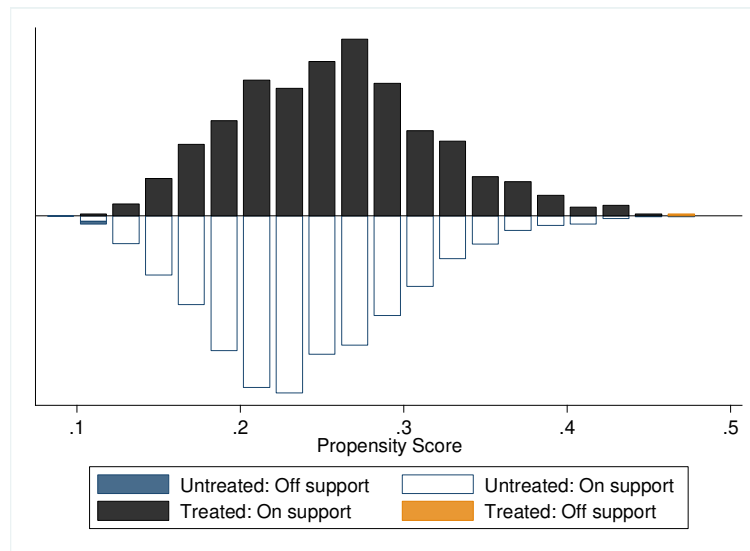


Figure 2: The distribution of observations on common support

*Matched and unmatched sample characteristics*

Table 1: Summary statistics and differences of means between *Osusu* and non-*Osusu* members.

	Unmatched				Matched			
	Full sample	<i>Osusu</i>	Non- <i>Osusu</i>	t-stat	Full sample	<i>Osusu</i>	Non- <i>Osusu</i>	t-stat
Domestic violence	0.583	0.547	0.595	-0.047*	0.578	0.546	0.613	-0.067*
Business	0.292	0.475	0.233	0.242***	0.357	0.469	0.236	0.233***
DV-Goes out	0.449	0.421	0.458	-0.037	0.438	0.413	0.464	-0.051
DV-Neglect children	0.459	0.411	0.475	-0.064**	0.440	0.397	0.486	-0.089**
DV-Argues	0.498	0.466	0.508	-0.043*	0.481	0.453	0.511	-0.058
DV-Refuse sex	0.307	0.286	0.314	-0.028	0.303	0.279	0.328	-0.050
DV-Burn food	0.184	0.148	0.196	-0.047**	0.169	0.147	0.191	-0.044*
Woman's age	31.799	33.071	31.389	1.682***	32.933	32.754	33.124	-0.369
Husband's age	40.617	41.852	40.220	1.633***	41.609	41.563	41.658	-0.095
Children ever born	3.322	3.669	3.211	0.458***	3.621	3.541	3.705	-0.164
Uneducated	0.635	0.631	0.637	-0.006	0.639	0.630	0.649	-0.019
Primary Educated	0.127	0.120	0.130	-0.010	0.112	0.123	0.100	0.023
Lower Secondary	0.125	0.138	0.121	0.017	0.136	0.130	0.142	-0.012
Upper Secondary	0.113	0.111	0.113	-0.002	0.114	0.118	0.109	0.009
TV-Not at all	0.792	0.781	0.796	-0.015	0.791	0.785	0.798	-0.013
TV-less than once	0.061	0.067	0.059	0.008	0.058	0.061	0.055	0.007
TV-At least once	0.068	0.072	0.066	0.006	0.068	0.073	0.062	0.012

TV-Every day	0.079	0.079	0.079	0.000	0.083	0.080	0.085	-0.005
TV-Not at all	0.601	0.570	0.611	-0.041	0.577	0.570	0.585	-0.015
TV-less than once	0.118	0.123	0.117	0.006	0.128	0.121	0.135	-0.013
TV-At least once	0.139	0.153	0.135	0.019	0.146	0.152	0.140	0.012
TV-Every day	0.141	0.155	0.137	0.017	0.148	0.157	0.138	0.019
1st wealth quintile	0.224	0.237	0.220	0.017	0.211	0.227	0.195	0.032
2nd wealth quintile	0.214	0.235	0.207	0.029	0.229	0.230	0.227	0.003
3rd wealth quintile	0.172	0.192	0.165	0.027	0.191	0.188	0.195	-0.007
4th wealth quintile	0.157	0.141	0.162	-0.022	0.150	0.148	0.151	-0.002
Rural residence	0.640	0.639	0.640	-0.001	0.635	0.626	0.644	-0.017
Observations	2948	718	2230	2948	1136	586	550	1136

Table 1 produces summary statistics for variables used in the paper. The first four columns show unmatched means for the full sample, the *Osusu* members, non-*Osusu* members, and the difference in means between the treated and the untreated, respectively. The overall domestic violence is low amongst *Osusu* members relative to non-member, while business is high amongst the members and low amongst non-members. Heterogeneities exist concerning types of domestic violence. Specifically, there is no difference conditional on *Osusu* in beating due to the wife going out without informing the husband and refusing sex, while *Osusu* members think a woman should not be beaten if she neglects children, argues with the husband, and burns food. In these first four columns, we also observe that *Osusu* women are older, they have older husbands, and have given birth to more children than non-members. The rest of the covariates are not distributed differently by *Osusu*, which confirms the observed substantial overlap in the un-matched propensity scores of *Osusu* participation.

Columns 5 to 8 of Table 1 presents means and differences in the characteristics between *Osusu* and non-*Osusu* members within the matched sample. All results maintain the same sign as that observed in the unmatched sample except the perception of women about the domestic violence influenced by the woman arguing with the husband. We observe that matching makes this form of domestic violence insensitive to *Osusu* membership. Further, controlling for propensity scores wipes out all differences in covariates (age of the women, age of the husband and number of children). This provides preliminary evidence that estimating the relationship between *Osusu* and domestic violence, using a *naïve* logit estimator, without the usage of the PSM would bias domestic violence estimates, particularly for the outcome of perception about whether a woman should be beaten by her husband if she argues with him.

#### *The relationship between Osusu, domestic violence and business ownership*

Table 2: The relationship between *Osusu*, domestic violence and business ownership

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Outcome</b>	<b>Domestic Violence (DV)</b>	<b>Business</b>	<b>DVA</b>	<b>DVB</b>	<b>DVC</b>	<b>DVD</b>	<b>DVE</b>
<b>Logit</b>							
<i>Osusu</i>	-0.044** (0.021)	0.204*** (0.016)	-0.035* (0.021)	-0.065*** (0.021)	-0.039* (0.021)	-0.019 (0.020)	-0.042** (0.017)
<b>PSM</b>							
<i>Osusu</i>	-0.067** (0.029)	0.212*** (0.026)	-0.012 (0.028)	-0.092*** (0.029)	-0.041 (0.030)	-0.033 (0.027)	-0.042* (0.023)
Observations	2948	2948	2942	2935	2930	2941	2932

Notes: Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

DV represents all forms of domestic violence categorised by women's perception on whether it is justifiable for a man to beat his wife if she: DVA-goes out without telling him, DVB-neglects children, DVC-argues with him, DVD-refuses sex, and DVE-burns food.

The estimations in the table control for age of the woman, age of the husband, number of children she ever gave birth to, her education level, whether she listens to radio and television, the wealth quintile for her household and whether she lives in the rural area or urban.

Table 2 presents results obtained from estimating equation (1). Column 1 shows how women's perception of domestic violence changes as they participate in *Osusu*, column 2 examines whether the changes in the perception of domestic violence due to *Osusu* are transmitted through adjustments in bargaining power captured as business ownership. Thus, whether *Osusu* enables women to acquire businesses. From columns 3 to 7, we examine the heterogeneity in the influence of *Osusu* in changing perception of domestic violence happening as a reprimand for specific behaviours displayed by the women. Specifically, this splits the domestic violence into justifications for beating if the woman goes out without telling the husband (column 3), neglects children (column 4), argues with the husband (column 5), refuses to have sex (column 6) and if she burns food.

In the first three rows of Table 2, we first present benchmark results that were estimated using a logit model, while in the last three rows we present those estimated using the propensity score matching. The logit estimates are marginal effects of the relationship between *Osusu* and domestic violence and business ownership. We compare logit estimates with the propensity score matching output to understand whether reducing selectivity bias changes the conclusion of our findings. If no change is observed, then estimating Equation 1 with logit or PSM does not make a difference. Further, this is a robustness check to ascertain the stability of our findings across estimators.

The logit findings reveal that participation in *Osusu* leads to reduction in justification of domestic violence by the women for domestic violence specified as any beating that a woman receives for doing anything that the husband deems inappropriate. *Osusu* is found increasing business ownership amongst females. Disaggregating the forms of domestic violence reveals

heterogeneity in the effects of *Osusu* on women's perception of domestic violence. Women who participate in *Osusu* do not agree that a man is justified in beating his wife if she goes out without telling him, neglects children, argues with him and burns food. The women, however, fail to reject that a man is justified in beating his wife if she refuses sex.

Results estimated using PSM are all consistent, but differences emerge concerning domestic violence, such as beating a woman if she goes out without telling the husband or arguing with him. Specifically, unlike the logit, which shows that *Osusu* reduces this form of domestic violence perception, the PSM shows that the same domestic violence is insensitive to participation in *Osusu*. Therefore, selectivity bias could distort the conclusion of domestic violence caused by the woman's behaviour to go out without telling her husband or argue with him if the PSM was not employed. These results reveal that domestic violence that happens because a woman argues with the husband or refuses sex is insensitive to the possible women empowerment obtained through financial inclusion. In contrast, general domestic violence reduces due to *Osusu* and business ownership increases amongst *Osusu* participating women.

## **Discussion**

The quantification of the association between village savings loans and women's perception of domestic violence remains a blind spot of current debates on women empowerment particularly in fragile states of sub-Saharan Africa. This paper has taken the case of Sierra Leone and drawn a sample of the same individuals who were interviewed in two independent and nationally representative surveys, one containing an identification of membership in a micro-finance group-*Osusu* and business ownership (The 2018 Sierra Leone Integrated Household Survey), and the other one containing an indicator of domestic violence (The 2018 Sierra Leone Multiple Indicator Cluster Survey). In a context characterized by high levels of domestic violence, we asked whether *Osusu* and non-*Osusu* women accept beating of the wife by a husband differently and whether rotational savings obtained from the *Osusu* membership are invested in the business.

Domestic violence responds negatively to *Osusu* membership in general and is conditional on the type of violence in question. *Osusu* women do not accept that a woman should be beaten by her husband in general terms. *Osusu* membership is associated with increased probability of owning a business, which is a form of women empowerment, and the membership makes the women intolerant to domestic violence. Further, the members do not accept that a man is justified to beat his wife if she neglects children and burns food. Besides that, there is no

statistical difference in the acceptance of beating related to going out without telling the husband, arguing with him, and refusing to have sex between *Osusu* members and non-members. This highlights that the effects of *Osusu* on domestic violence are limited to specific forms of the women's abuse act.

The results conform to the theory of marital bargaining, which posits that empowered women, through increased contribution to household welfare envelop, obtain a new household position that makes men respect them and treat them well (McElroy, 1990; McElroy & Horney, 1981). Similar evidence has been found in Cameroon (Eze-Eze, 2019) and South Africa (Kim, Watts, Hargreaves, *et al.*, 2007), where involvement in a microcredit program increases female resistance to domestic violence. Our study adds to this literature by exploring a transmission mechanism-business-which is leading to this increased female agency.

The evidence found in this paper conflict with the men backlash theory which posits that domestic violence increases where a woman has access to resources that improve her relative financial position to her husband (Lundberg & Pollak, 1993; Sen, 1987). The proponents of backlash argue that this form of domestic violence comes as a remedy for men to reinforce their reduced relative bargaining power and regain dominance. The backlash theory is more applicable in Bangladesh as a study in the country (Bajracharya & Amin, 2013) showed that even when women participate in microcredit, they do not invest it in avenues such as business, but rather the husband takes charge and spends it.

Our results also raise a central question about the persistence of some forms of domestic violence, even in the presence of empowered women. *Osusu* women are not different in acceptance of domestic violence related to going out without informing a husband, arguing with him, and refusing sex, which is all direct responsibilities in relation to the man. This is opposed to the findings on domestic violence related to the general responsibility of couples to the household as a whole such as neglecting children and burning food, which we find negatively associated with *Osusu*. These variations in findings reveal that traditional values that enforce unconditional loyalty to abuse between couples need special attention. Further, the result implies that microcredit could be reliable in reducing general levels of domestic violence only through mitigating violence related to broader household responsibilities.

Our study is not without limitations. As mentioned in the methodology section, we measured domestic violence by whether the woman agrees that a husband is justified in beating his wife. Often studies that find that microcredit reduces domestic violence also use this question (Eze-

Eze, 2019; Kim *et al.*, 2007). Other studies use the question of whether the women experienced domestic violence and find that domestic violence is non-responsive to participation in microcredit (Bajracharya & Amin, 2013; Chin, 2012). Nevertheless, the literature cautions the use of such direct questions as they are associated with increased measurement errors (Andersson & Cockcroft, 2009; Mitra *et al.*, 2021; Zakar, Zakar & Krämer, 2012). The errors emerge because, under high levels of domestic violence, women may be unwilling to answer direct experience questions for fear of more harsh treatment, appearing to wreck their family by exposing private information and indeed fear of divorce (Mitra *et al.*, 2021). These discrepancies can be resolved by using both types of questions on the same subject. Our datasets, as is the case in most surveys, did not have both questions. We, therefore, leave this as an area for future research subject to the availability of data.

## **Conclusion**

Domestic violence has gained traction in the women empowerment literature. This paper examined the relationship between membership in microcredit-*Osusu* and domestic violence using data from 2948 women from a fragile state, Sierra Leone. Econometric methods reveal that a woman's membership in *Osusu* reduces her general tolerance of domestic violence. The result is driven by a reduction in acceptance of domestic violence that is specific to household responsibilities, including beating if a woman neglects children or burns food. Domestic violence that is classified as a personal responsibility to couples, such as if the women go out without telling the husband, arguing with the husband, and refusing sex, is non-responsive to participation in *Osusu*. We further find that domestic violence positively associates with business ownership. Arguably, business ownership increases the women's bargaining power, allowing them to stand against domestic violence. Therefore, policies that aim at increasing microcredit access amongst women have the potential to reduce domestic violence. Nevertheless, microcredit is not a *panacea* for all forms of domestic violence, as our results show that non-household responsibility initiated domestic violence is not responsive to the membership. Providing legal and other institutional support such as forums where women can open and report all forms of domestic violence could be an additional remedy to domestic violence, particularly that which does not respond to microcredit outlets such as the *Osusu* of Sierra Leone.

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