POWER IN HOUSEHOLDS: DISENTANGLING BARGAINING POWER

Ramzi Mabsout* and Irene van Staveren*#

*Department of Economics, Radboud University Nijmegen
#Institute of Social Studies

R.Mabsout@fm.ru.nl
i.staveren@iss.nl

POWER IN HOUSEHOLDS: DISENTANGLING BARGAINING POWER

Introduction

Within the household bargaining literature, bargaining power is generally understood in terms of economic resources, such as income or assets. Empirical analyses of women's bargaining power in households in developed and developing countries find that, in general, higher female incomes lead to higher bargaining power, which in turn tends to increase women's relative wellbeing (Quisumbing, 2003). For assets, the empirical literature comes up with similar results, indicating that when women hold more assets, their bargaining power improves, with a positive impact on decision making power and subsequently, on women's individual wellbeing indicators (Agarwal, 1994). Such findings confirm the general idea behind household bargaining models stating that control over more economic resources strengthens women's fallback position vis-à-vis their partners, and could serve as a threat point in case of conflicting interests. Moreover, in cooperative bargaining models, women's contribution of economic goods to the household increases their economic value to the partner, so that even without using one's fallback position as a threat point, women's bargaining power is likely to increase with more control over economic resources because the opportunity costs to the partner of not cooperating will increase.

But the household bargaining literature also indicates that under certain circumstances there does not emerge a positive relationship between women's resources on the one hand and their empowerment on the other hand. Such perverse effects have particularly been found for women's access to credit in South-Asia, where women's loans may be appropriated by men, which for some women makes them worse off economically (Goetz and Sen Gupta, 1996) or it tends to increase domestic violence (Rahman, 1999). In sub-Saharan Africa empirical research has found that the higher women's income, the lower men's contribution to household expenditures and the higher the share of income that men spend on personal consumption (Bruce and Dwyer, 1988; Odebode and van Staveren, 2007). This means that when empirical analyses find that women's share of household assets (Doss, 2005) or household expenditures (Woolley and Chen, 2001) have a significant positive effect on household purchases that are particularly valued by women, this does not necessarily imply that women's bargaining power has increased, because the male partner may at the same time reduce his contribution to these and/or other expenditure items. Household bargaining power is a relative notion in which it is the relative bargaining power between the partners which matters, not only a change in the position of one partner. It can therefore not be understood from an individual level only but requires a relational, hence social, perspective, which is the reason why a comprehensive household bargaining analysis is quite complex (Seiz, 1995; 1999). Rae Lesser Blumberg (1991) has summarized the social factors that seem to distort the positive relationship between resources and empowerment: (a) the stronger gender inequality in society at large, the weaker the relationship between women's resources and empowerment; (b) in societies where women have been socialized not to ask or negotiate for what

they want but to accept male authority, they are not likely to use their bargaining power even if they have it; (c) in societies where men do not fully recognize women's paid and unpaid contributions to the household, their valuation of women's contribution will be lower than women's actual contributions, which will the bargaining power that women can derive from their contributions. Amartya Sen (1990) has added a fourth factor: (d) women may develop adaptive preferences, which undermines their bargaining power, because they learn to accept their disadvantaged position as normal or even as a virtue of what is considered to be a good wife or good mother. The literature seems to suggest, hence, that even though at the individual level women may own resources and contribute these to the household, at the social-cultural level, this is not well recognized by men as legitimately representing bargaining power for women, and hence, a threat point. These four reasons that negatively affect women's bargaining position in the household suggest that apart from intra-household bargaining factors there are also extra-household bargaining factors which affect women's household bargaining power, as Bina Agarwal (1997) already recognized in her rich descriptive analysis of the household bargaining approach. Whereas she identified social norms and extra-household bargaining power as two distinct factors that needed further clarification in empirical research, we hypothesize that social norms, together with cultural practices, laws, and regulations, are actually a major form of extra-household bargaining.

In this paper, we want to explore the relative impact of gendered institutions, representing extra-household bargaining power, as compared to intra-household bargaining power. We will do so by using data from a country, Ethiopia, with very asymmetric gendered institutions but with wide variation across the country. Our hypothesis is that gendered institutions have an important effect on women's bargaining power in households and that this effect may even be larger than the effect of individual characteristics such as women's economic resources. The structure of the paper is as follows. The next section will discuss relevant literature, focusing on different types and levels of bargaining power. The following section will describe the major insights from literature on women's position in Ethiopia and gendered institutions. The section thereafter will present the model that we will use to analyse the data, a multi-level probit model in which intra-household level variables and institutional variables will be analysed at separate levels. The next section will discuss the results and the paper will end with a conclusion on the relevance of distinguishing levels of bargaining power.

Levels of Bargaining Power

Although income and assets are still mostly used, recent literature uses a wider variety of determinants of bargaining power. These determinants may be categorized at three levels, with decreasing control by bargaining partners. The first level is the individual level, with individual characteristics such as age, level of education, income, assets, but also psychological characteristics such as self-esteem, which are often unobservable variables. The second level is the household level, with variables such as joint household assets, the age difference between partners and educational differences, as well as

characteristics of marriage such as polygamy, head of household, and the quality of the relationship which, again, is often unobservable. The third level of determinants is located outside the household and largely beyond the control of individual women and men, at least in the short run. These concern the gendered institutions which are by definition asymmetric for women and men (Goetz, 1997; Odebode and van Staveren, 2007). They represent what Agarwal calls preconditions for the bargaining power of partners in the household, which is a kind of passive bargaining power which favours one partner over the other. This third type of bargaining power hence can hardly be controlled by individuals. Gendered institutions can be formal, as laws and regulations that are defined unequally for men and women, such as land rights and fiscal regulations. Other gendered institutions are informal, defined by gender-biased social norms and cultural practices expressing beliefs about what is appropriate for men and women to be, to do, and to have. Examples are the gender division of labour in the household, and domestic violence. Both formal and informal gendered institutions affect household bargaining power, as described by Agarwal (1997). First, gendered institutions are a determinant of bargaining power through asymmetrically influencing partners' fall-back positions. But they also define what can and what cannot be bargained over, for example, whether men's participation in domestic tasks or women's ownership of land can or cannot be negotiated. If a social norm that men never do housework is very strong, or if the law only grants land titles to men, these issues are clearly not negotiable. But it may be the case that some gendered institutions are being challenged, either by the government in legal changes or awareness campaigns, or by civil society. In those circumstances, women may challenge norms and laws too at the household level. In that case, gendered institutions themselves become subject of what is bargained over. Finally, informal institutions may shape the ways how women cane legitimately bargain vis-à-vis their male partners, for example openly without fear of domestic violence, or covertly with less assertiveness.

In addition to the three levels of determinants of bargaining power, the literature also distinguishes two ways in which bargaining power itself is measured. The first is a direct measure through variables that measure decision making power itself, for example a measure of who has more decision making power on household purchases. The second type of measure is an indirect measure using variables of outcomes of a decision making process between partners, for example reduced domestic violence or improved health status. Recent empirical literature on household bargaining employs each of the three levels of determinants of bargaining power and both measures of bargaining power. Moreover, the literature recognizes endogeneity effects so that bargaining power and outcomes can be understood as a two-way relationship (Basu, 2006). The six possible bargaining situations are illustrated in table 1 below. Hence, compared with the earlier household bargaining models, which were largely limited to the individual level (cells A and B), with household level variables included only as control variables (cells C and D), today the variations in empirical bargaining analyses are much richer, covering the whole array of determinants and measures of bargaining power. As a consequence, the literature tends to find less straightforward results than before. Below, we will briefly review some of this literature, starting at the individual level.

Table 1: Determinants and measures of bargaining power (BP)

	Individual level	Household level	Institutional level
Direct measures of BP	A	C	E
Indirect measures of BP	B	D	F

At the individual level it has been confirmed that women's increased assets have a positive effect on various indirect measures of bargaining power. In India it was found that an increase in women's assets, by moving from property rights in the name of men to joint property rights for housing, did help to strengthen women's decision making power in the household, their level of security, and their assertiveness leading to more self-confidence, security and respect (Datta, 2006). Moreover, as another study on India has shown, an increase in women's property ownership also had a significant positive impact on lowering the risk of marital violence (Panda and Agarwal, 2005). For Nepal, it was found that earnings do have a significant positive impact on women's bargaining position, measured in terms of household expenditure patterns, but that this effect is moderate compared to the effect of the educational difference between the partners (Koolwal, 2005). This brings us to the second level of bargaining determinants, the household level, with relative wife-husband variables.

A study on the US found a positive and significant effect of women's educational attainment compared to men, with reductions in annual hours of paid work as a measure of bargaining power (Orrefice and Bercea (2007). Next to the educational difference between husband and wife, the age difference seems to matter too. Evidence for this was reported in a study on the US in which earnings had only a moderate effect whereas the age-difference between partners appeared to have a stronger effect on household wealth (Friedberg and Webb, 2006). A recent empirical model with household data from China has analysed the impact of earnings and women's relative wages on hours of domestic work and the division of domestic tasks between husband and wife. Women's earnings, reflecting hours of paid work, appeared not to have a significant effect whereas the gender wage gap did have a significant positive effect on reducing women's hours of domestic work and men's participation in domestic tasks (MacPhail and Dong, 2007). This finding suggests that even though women's threat point improves and men's opportunity costs of a break-up increase with women's higher earnings, women's income has not a significant impact on their status in the household as long as labour market institutions keep women's wages well below men's wages. Therefore, the authors suggest that their finding probably reflects the widely accepted social norm that domestic tasks are women's duty, a social norm which may only change when also outside the household women's work is awarded less unfavourable value compared to men's work. Anna Aizer (2007) has also found a positive significant effect from the gender wage gap for women's bargaining outcomes, in this case on the reduction of violence against women in the US. In her model, it was not the household level gender wage ratio but a local labour market gender wage ratio variable, measured at county level, hence, measured outside the household. This seems an indication that MacPhail and Dong's suggested explanation of a social norm about the value of women relative to men, signalled through the gender wage gap, may indeed be a relevant explanation for the statistical

relationship. This finding moves us to the third level of determinants of household bargaining power, the institutional level of social norms, cultural practices, laws and regulations.

A recent qualitative study on Burkina Faso has analysed the impact of gendered social norms on women's bargaining power to seek health care. The study found that social norms about women's proper behaviour help to explain differences in women's ability to seek health care for themselves (Nikièma, Haddad and Potvin, 2008). The study revealed that even when women have the resources to pay for medicines or to visit a clinic, they will not be allowed to do so without permission from their husbands who only give permission when they judge their wife's behaviour sufficiently submissive. Legal changes towards more freedom for women have also shown to improve women's bargaining position, as the studies by Datta (2006) and Panda and Agarwal (2005) referred to above on gender equality in property rights already indicated. A study on Canada has found that a change in divorce law allowing women a fair share in assets acquired during marriage even when they did not do paid work, has a significant negative effect on female adult suicides, in particular among married women, and not on male adult suicides (Hoddinott and Adam, 1996). A recent study on the US, comparing states with early unilateral divorce law with states that had these laws later, finds that domestic violence against women, women murdered by their partners and female suicide are significantly lower in states that adopted unilateral divorce laws early on (Stevenson and Wolfers, 2006). Gendered institutions – formal and informal – hence appear to have an important influence over the household bargaining process, affecting fall-back positions, determining what can and what cannot be bargained over, and how bargaining is expressed.

Women's Position in Ethiopia

The new federal constitution grants equal rights to women with men, including equal rights in marriage, property rights, inheritance, and protection against harmful tradition practices, which are explicitly prohibited by the law (Vaughan and Tronvoll, 2003). Nevertheless, the prevalence of female genital mutilation (FGM) in Ethiopia is among the highest in the world, 74% according to the DHS 2005 data we use. The government actions taken to eliminate the practice are insufficient (WHO, 1999). One explanation for the weak implementation of laws against FGM and other harmful traditional practices in the country is that the women's movement is small and weak (Biseswar, 2008). There is a slight increase in the share of women in politics but some regions on the country still do not recognize women as viable candidates for leadership posts (idem p. 136). Biseswar relates this weak representation of women and weak role of feminism in the country to the dominance of the Amhara-Tigray culture, which is very hierarchical and "respect for unchallenged authority as its core virtue" (idem: 139). The author draws a strong implication of this culture for the strength of patriarchy in Ethiopia: "Within this hierarchy, women are relegated to the bottom, where they silently accept their fate, never daring to question male authority"(p. 140). Another explanation why gender equal laws are not enforced is that these laws are made at the federal level, whereas various states have been granted full sovereignty,

which allows them to practice earlier laws that discriminate against women (Wikigender, accessed 11/04/2008).

Next to FGM, women's position in Ethiopia is also disadvantaged in various other aspects, including a low priority to mother and child health in the national healthcare system (Bevan and Pankhurst, 2007: 5). Women and girls spend long hours on domestic work (idem p. 8). Polygamy has also been prohibited but still prevails, while the new official minimum age for marriage for women has pulled up from 15 to 18, which however, is still circumvented. Informal gendered institutions are still strongly transmitted from older to younger generations. "parents still train their children into gendered habituses emphasizing the need for males to learn aggression and females submission"(idem p. 8). The same counts for the continuity of FGM: "female circumcision is widely supported by males and females throughout rural Ethiopia; uncircumcised girls/women (depending on cultural context) bring shame on their families, cannot get married, and cannot be buried in churchyards". (idem p. 12). The DHS data show that 31% of women support the continuation of FGM, less among younger women and more among older women, indicating that this support is probably declining..

The report for the 2005 Demographic and Health Survey (DHS), which we will use in our empirical analysis, has provided a useful descriptive analysis of women's position (Central Statistical Agency, 2006). This overview shows that 31% of women is employed of whom 60% works unpaid. 27% earns cash and 14% in-kind or a combination of cash and in-kind. 39% of women who earn cash decide alone how these are to be spent, whereas 51% decides jointly with the husband. 13% of the women believe they earn more than their husband while 64% believes they earn less, with a higher percentage among the older age groups, perhaps reflecting the general age difference between married men and women, leading to older women to be married with very old men who may no longer be able to earn as much as before.

Empirical Analysis of Women's Bargaining Power in Ethiopia

The 2005 Ethiopia DHS is used to test the hypothesis of different bargaining effects. The DHS with sample weights is representative of the Ethiopian adult women population. For the couples file, both husband and wife were interviewed. The file is a sub data set within the larger survey. The un-weighted sample size for couples is 2968 dyads. Weighted the sample size is 3236 dyads.

Two models can disentangle the influence of bargaining types on decision making. One model is a rather standard regression model with ethnic groups included as dummy variables. The other possibility is a multi-level model in which the higher level is represented by ethnicity. While both use sample weights for unequal probability selection and ethnic group belonging for underestimation of standard errors, the aggregate model (Stapelton, 2006:350), does not explicitly distinguish between

levels of analysis.[1] The aggregate model is a probit regression with Taylor like-series functions to correct standard errors (Stapelton, 2006:352). The second model uses ethnic information to disaggregate variance and distinguish between variance within the household and variance outside the household. With information on ethnic belonging it is possible to form groups across ethnic lines. Table 2 lists the different ethnicities grouping in the data set.

Table 2: Ethnicities in Ethiopia

Number	Ethnicity	Frequency	Percent
etn1	Affar / Adal, Danakil, Denkel	27	0.8%
etn2	Agew-Kamyr / Kamtang	18	0.6%
etn3	Amara / Gondere, Gayente, Semen, Farte, Gojjame, Dawunte, Wa	997	30.8%
etn4	Anyiwak / Yembo	2	0.1%
etn5	Southern minority	135	4.2%
etn6	Gedeo / Derassa	52	1.6%
etn7	Gumuz / Ganza, Ganzo, Bega, Baga, Shankila, Say, Sese	6	0.2%
etn8	Gurarie / Cheha, Ener, Enemor, Ezaya, Gumer, Gura, Megareb,	95	2.9%
etn9	Hadiya	69	2.1%
etn10	Harerri / Adere	0	0.0%
etn11	Jebelawi / Berta, Benshangul, Wutawut, Shogo, Undu, Meyu, Ge	9	0.3%
etn12	Keffa / Kefficho	56	1.7%
etn13	Mocha / Shekicho	1	0.0%
etn14	Kembata	26	0.8%
etn15	Nuwer / Abigar	1	0.0%
etn16	Oromo / Guji, Borena, Tulema, Kereyu, Gelan, Lika, Weredube,	1128	34.9%
etn17	Shinasha / Boro, Shencho, Dengebo	1	0.0%
etn18	Sidama	164	5.1%
etn19	Somalie	102	3.2%
etn20	Tigraway / Tigre	188	5.8%
etn21	Welaita	71	2.2%
etn22	Gamo	70	2.1%
etn23	Other Ethiopian National Groups	7	0.2%
etn24	Other foreigners	2	0.1%
Total valid		3227	99.7%
Missing		8	0.3%
Total		3236	100%

Source: Demographic Health Surveys.

The dependent variable to be explained is women's decision making in the household, hence the first row of table 1, a direct measure of bargaining power. The hypothesis to be tested requires the distinction between the effects of bargaining at level 1 (individual) and level 2 (household) on the one hand, and those of bargaining at level 3 (institutions – categorized at the ethnic level) on the other hand. In the 2005 Ethiopia DHS all interviewed women were requested to answer who decides over four domains. These decisions concern own health, daily household needs, large household purchases, and visits to family and relatives. Interviewed women could answer (i) someone else takes the decision, (ii) the decision is shared or (iii) the decision is taken by the respondent alone.

---

[1] Note that sample weights do not correct for interdependence among individuals in groups.

The decision making variables y can be modelled in three different approaches. First, an underlying continuous function y_c is assumed from more to less autonomy. Underlying y_c a continuous unobservable variable y^* with thresholds is assumed. When the score of individual i on y^* is say above threshold t_1 then the answer would fall in category 1 of variable y_c. The categorical outcome variables y_c is linked to y^* using a link function which can be a logit or probit. A link function tethers the categorical outcome to a continuous but unobservable variable. Logit and probit link functions are two different yet somewhat similar link functions. A linear estimator may not be used with categorical outcomes because they predict outside the boundaries of the categorical variable 0 or 1 (for a dichotomous dependent variable). The general form of the probit and logit with x_1 and x_2 as covariates is

$$Prob(y_c = 0|x_1, x_2) = F[\beta_0 + \beta_1 x_1 + \beta_2 x_2] \tag{1}$$

Where *F[.]* can be either the standard normal ($\Phi[z]$) or logistic ($1/[1+e^{-z}]$) distribution function (Muthén and Muthén, 2007). From the three possible answer categories then y^* is interpolated and plugged in equation (1) and (2) as the dependent variable (see below). When y^* is at its minimum a respondent has the least autonomy (i.e., someone else takes the decision). When y^* is at the maximum a woman has the most autonomy and it is probable decisions are taken alone.

Second, an underlying continuity of y from less to more autonomy does not have to be assumed. The difficulty with the continuity assumption across the response categories is that the possibility that a woman who shares the decision with her husband is more autonomous than a woman who takes the decision alone cannot be ruled out on a priori grounds. That is because a shared decision may be taken out of mutual respect whereas a decision alone by the woman may reflect conflict and separate spheres, or a dependent husband for example because of illness. This ordering assumption may therefore be dropped. To avoid a potential lack of continuity from less to more autonomy, every response can be framed as a dichotomous variable.[2] For every dimension then three equations are estimated: one for someone else, one for shared and one for alone. Instead of four equations, one for every dimension, a total of 12 is estimated.

For the first two modelling choices of the independent variable a probit is used. This gives equations (2-3).

$$Prob(y_c = 1|x) = \Phi(\alpha + \beta x) \tag{2}$$

---

[2] This can also be done using a multinomial logistic regression (Heck and Thomas, 2008:208, 213).

Which upon inversion gives the probit regression:

$$y^* = \Phi^{-1} = \alpha + \beta x \qquad (3)$$

Where a unit change in x results in a standard deviation change in the probit score.[3] All categorical equations are estimated using probit and the Maximum Likelihood Robust (MLR) estimator for non-normality and non-independence of observations corrected standard errors and model diagnostics (Heck and Thomas, 2008:64). MLR is a full information maximum likelihood estimator which facilitates the analysis of continuous, categorical, unbalanced group sizes, and random slopes models (Heck and Thomas, 2008:116). Although MLR limits the range of diagnostics it is needed for a later model that explores the possibility of random slopes (over and above random intercepts).

The most restrictive modelling approach involves forming an index of all decision making variables. Two assumptions are implied. First, the above continuity assumption is needed. Second, the four decision making variables should be uni-dimensional—that is they should be realisation of a single decision making autonomy unobservable dimension. Still, the advantage of factor model for decision making is the accounting for measurement error and therefore rending the analysis more accurate (Heck and Thomas, 2008:101-2, 110).

In general terms, equation (4) provides the aggregate probit regression.

$$y^*_{abcd} = \alpha + \beta x_{abcd} + e_{abcd} \qquad (4)$$

Where
y^* is the latent outcome decision making variable for individual a = (male, female), household b, ethnic group c, and indicator d
α an intercept coefficient
β a slope coefficient
x an explanatory variable for individual a = (male, female), household b, ethnic group c, and indicator d
e a residual error term with mean of zero and constant variance of one.

At the individual level, the dependent variables are the underlying continuous interpolations from the raw categorical variables using the standard normal function. The intercepts are the thresholds. A threshold is the negative of the intercept (Muthen, 2004:2, equation 11). The number of thresholds to be estimated equals the number of categories in y_c minus one (Muthen, 2004:3-4).

---

[3] In probit models the variance of the residuals is scaled to one to identify y^*.

Equations (5) and (6) model a multilevel system with random intercepts. The random intercepts are estimated at the between level model, which is the 3rd bargaining level..

$$y^{*}_{abcd} = \alpha_c + \beta x'_{abcd} + e'_{abcd} \tag{5}$$

$$\alpha_c = \pi + \gamma \bar{X} + \omega_c \tag{6}$$

$$y^{*}_{abcd} = \pi + \gamma \bar{X} + \beta x'_{abcd} + \omega_c + e'_{abcd} \tag{7}$$

In the multilevel model, equation (5) is estimated for each ethnic group. If there is enough variance between groups in intercepts they can be used to estimate γ in (6). Ethnic group intercepts are the dependent variable to be explained by group mean (ecological) covariates.

The differences between equations (4) and (5) are the random intercept α_c and the exclusion of the higher level variables $\bar{X}$ from x'_{abcd} in (4). In equation (6) π is the fixed mean intercept. γ is the fixed coefficient of the ecological predictor $\bar{X}$. And ω_c the higher level random residual component which also has a mean of zero, a constant variance and is independent of e' the individual level error term. Finally, equation (7) is obtained by plugging (6 in (5).

For the modelling of the single dimension index, a measurement model is estimated as a first step. The simplest aggregate measurement model can be represented as:

$$y_a = v + \Lambda \eta_a + \epsilon_a \tag{8}$$

Factor scores are then used as dependent variables for covariates x.

$$\eta_a = \alpha + \Gamma x_a + \zeta_a \tag{9}$$

The covariates in x, x' and $\bar{x}$ are listed in table 3 with their descriptive statistics.

Table 3: Descriptive statistics

Covariate	Valid N	Code	Minimum	Maximum	Mean	Standard deviation
U_R	3236	1=urban, 0=rural	0	1	0.08	0.27
AGE	3236	log(age)	2.71	3.89	3.36	0.28
AGE_D	3236	Wife(age) - Husband(age)	-40	16	-7.41	5.17
Educ	3236	log(years)	0	2.94	0.34	0.70
Head	3236	1=head, 0=otherwise	0	1	0.03	0.16
PropHExp	3236	Wife share household exp 0=none, 2=less than half, 3=half. 4=more than half	0	4	0.21	0.71
W_FS_H	3235	Wife final say health	1	3	1.77	0.65
W_FS_LHP	3235	Wife final say large household purchases	1	3	1.65	0.65
W_FS_DN	3234	Wife final say household daily needs	1	3	2.34	0.74
W_FS_VFR	3235	Wife final say visits family relatives	1	3	1.87	0.51
FHR	3074	Factor husband right	-3.90	0.56	-0.03	1.02
FHBJ	3078	Factor husband: Wife beating justification	-2.01	0.83	-0.04	1.00
FWBJ	3160	Factor wife: wife beating justification	-1.13	1.60	-0.16	0.97
DBJ	3003	Difference beating justification	-1.96	3.61	-0.16	1.30
CIRCUCONT	2771	Should circumcision continue 1=no, 0=yes	0	1	0.58	0.49
Valid N			2538			

Source: Demographic Health Surveys.

The objective variables hypothesised to affect women's decision making are age of women, age difference with husband, years of education, proportion of wife household expenditure, head, wife number, and urban dwelling. The subjective variables used as covariates are women says circumcision should continue, a factor of husband rights over wife, a factor for wife and husband's wife beating justification, and the difference between husband and wife beating justification.[4]

Variables in table 2 can be modelled at the individual/household level, institutional level or both. Variables modelled at the higher level to explain variance in intercepts across groups are preceded by the letter CM for cluster mean. The intraclass (ICC) correlations are the first step in multilevel modelling. After checking the ICCs, an assessment of random intercepts and subsequently random slopes is done (Heck and Thomas, 2008:81). But to start intraclass correlations help gauge the level of homogeneity in groups; they provide an empirical criterion for modelling variables at the higher level. The ICC is the proportion of institutional level variance to total variance or the expected correlation between two randomly selected individuals from a group (Hox, 2002:16). The ICCs of a variable is large when individuals in ethnic groups are roughly similar. In this case a single random individual provides a good proxy for the group. Variables which vary little in ethnic groups at the individual level are aggregated at the ethnic group level since little information is lost. The ICC is given in equation (10).

---

[4] The variables forming the factors for husband rights and wife beating justification are husband has right to: get angry, refuse financial support, use force for unwanted sex, have sex with another women, wife beating justified if she goes out without telling him, if she neglects the children, if she argues with him, if she refuses to have sex with him, if she burns the food.

$$\rho = \sigma^2_{group} \Big/ (\sigma^2_{group} + \sigma^2_{individual}) \qquad (10)$$

Where σ^2_{group} is group level variance and $\sigma^2_{individual}$ is individual level variance. Total variance is given by

$$\sigma^2_{total} = \sigma^2_{group} + \sigma^2_{individual} \qquad (11)$$

Design effects (Snijders and Bosker, 2004:23) adjust ICCs for average group size and are given in equation (12).

$$DE = 1 + (c-1)\rho \qquad (12)$$

For variables to be modelled at the higher level a share of variance larger than 5% is required (Heck and Thomas, 2008:21) whereas design effects larger than two are needed (Muthen, 1999). These are rough empirical criteria to model a variable at the higher level. The literature finds lower ICCs for demographic variables (gender, age) and higher for socio-economic variables and attitudes (Stapelton, 2006:356). Table 4 provides the ICCs and design effects for all the variables included in the analysis.

Table 4: Intraclass correlations

	Intraclass correlations*	Design effects (average cluster size=114)*
U_R	0.37	42.25
CIRCUCON	0.31	36.37
EDUC	0.14	17.05
HEAD	0.14	16.71
W_FS_DN	0.13	15.69
W_FS_H	0.11	13.20
W_FS_VFR	0.10	11.85
W_FS_LHP	0.07	8.91
FHBJ	0.06	8.23
PROPHEXP	0.06	7.78
FWBJ	0.06	7.67
FHR	0.05	6.88
AGE_D	0.04	5.86
DBJ	0.03	4.50
AGE	0.03	3.83
Average	**0.11**	**13.78**

*Variables that should be modelled at the higher have an ICC above 0.05 and a DE above 2. The number of groups is 24.

It can be concluded from these ICCs that all variables except age difference, difference in beating justification and age have enough variance to be modelled at the institutional level. When account is taken of ethnic group size, all variables have enough variance to be modelled at the institutional level.

Given however the highly unequal group sizes, the average can be a misleading indicator and could further bias the DE estimates.

Two remarks on the ICCs are necessary. First, the larger the ICCs the less additional information is gained with additional individual within groups (since all individuals are similar and an addition adds little new. See Heck and Thomas (2008:72-3)). Second, it can also be noted, for variables modelled at both levels the relationship within group does not necessarily have the same meaning; when variables have different meaning at the group level and the individual level none-isomorphism is said to obtain (van de Vijver et al, 2008:10).

In this sample, finally, some (weighted) groups are very small (eg., Harerri / Adere). The ethnic grouping form naturally clusters of different sizes. However, unbalanced groups and groups of small size make estimation less reliable (Heck and Thomas, 2008:59). With unbalanced group size, the larger clusters will weigh more on the overall mean parameter estimates (Heck and Thomas, 2008:54-5). But an overall large sample size does not compensate for a small number of groups at the higher level (Cheung and Au, 2005). The recommended number of groups is 100 but estimation with as little as 20 groups is common (Cheung and Au, 2005:603-4).

Estimation

The bargaining theoretical framework discussed earlier also has an overlapping statistical interpretation. The statistical intuition starts with the fact that individuals in groups share common traits. Groups, in other words, tend to be more homogeneous in certain respects. Ethnic belonging can be seen as a grouping variable in Ethiopia. The strength of ethnicities on individual statistics was illustrated in the previous section when variables' share of variance revealed substantial proportions at the ethnic level. High intraclass correlations imply strong (within) group homogeneity. Studying variables measured at the individual and household level without accounting for this influence biases estimates.

The dependent variables cover four areas of decision making. The first empirical questions is to what extent these variables together form a global decision making index? Aggregation into a single index has some advantages. With aggregation it is possible to control for measurement error and provide a single indicator for decision making for estimation. Cronbach's alpha, a measure of reliability, provides a quick way to evaluate uni-dimensionality of the dependent variables y_c (Heck and Thomas, 2008:29). An alpha level of 0.8 is provided in the psychological literature to establish uni-dimensionality (Netemeyer et al, 2003:126).[5] The Cronbach alpha of the four decision making dimensions taken together is 0.513. This score is under 0.8 and implies the possibility of several

---

[5] Alpha is calculated using the ratio average covariance to average variance between items which simplifies to average correlation with equal item variance $k \frac{\bar{r}}{1+(k-1)\bar{r}}$

dimensions. However, Cronbach alpha uses statistics for continuous variables which may bias the correlation estimates downward when used for variables with less than four categories. The alternative is to test the decision making index using confirmatory categorical factor analysis (CFA). An aggregate factor as well as a two level factor are used to assess the decision making index.

The statistical of this CFA at level are given in Table 5.

Table 5: Aggregate confirmatory factor analysis

Decision making: Probit		
W_FS_H	1	999
W_FS_LHP	0.76	0.0%
W_FS_DN	0.53	0.0%
W_FS_VFR	1.2	0.0%

*Fixed to one.

Although the CFA loadings have the expected sign and are significant, the diagnostics for the aggregate model lead to the rejection of the one factor CFA.[6] While this may be due to the exclusion of cofactors (Bentler, 2006, p. 34-35, 39), a logical next step is to test a multilevel CFA with random intercepts in light of the information provided by the ICCs (Hox, 2002). Unfortunately, the multilevel categorical CFA does not provide statistical significance diagnostics such as those made available in aggregate level analysis. Table 6 gives the multilevel random slopes estimates of the decision making CFA.

Table 6: Random intercepts confirmatory factor analysis

DM_Within: Probit		
W_FS_H*	1	999
W_FS_LHP	0.91	0.0%
W_FS_DN	0.73	1.1%
W_FS_VFR	1.27	0.0%

DM_Between		
W_FS_H*	1	999
W_FS_LHP	0.81	8.4%
W_FS_DN	0.30	79.2%
W_FS_VFR	1.01	25.4%

*Fixed to one.

The lower level and upper level models have different patterns of significance, equalising the loadings between levels does not lead to a significant loss in terms of model fit (table 7). The difference in model fit was tested using the scaled loglikelihood chi-square difference test (Muthen and Muthen, 2008).

---

[6] The structural equation diagnostics are estimated with the weighted least square estimator and use logit instead of probit. The values obtained are chi-square pvalue=0.00, CFI=0.84, RMSEA=0.09, WRMR=1.10.

Table 7: Random intercepts confirmatory factor analysis with equalised coefficients

DM_W: Probit (equalised)		
W_FS_H*	1	999
W_FS_LHP	0.90	0.0%
W_FS_DN	0.63	0.1%
W_FS_VFR	1.17	0.0%

DM_B (equalised)		
W_FS_H*	1	999
W_FS_LHP	0.90	0.0%
W_FS_DN	0.63	0.1%
W_FS_VFR	1.17	0.0%

*Fixed to one.

Before running the multilevel model with covariates, in Table 8, the aggregate CFA is estimated with covariates. The model estimated in table is known in the structural equation literature by the acronyms MIMIC which stand for Multiple Indicators Multiple Causes (MIMIC) systems. Figure 1 below provides a diagram of a standard MIMIC.

Figure 1: The Multiple Indicators Multiple Causes model (MIMIC)
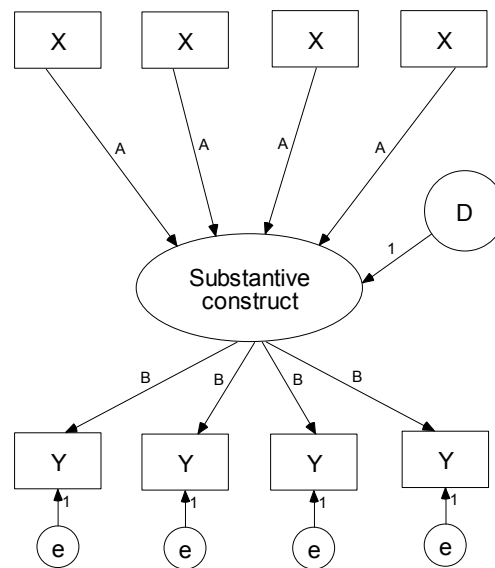
In figure 1, X represent covariates, A the regression coefficients, Y the measurement variables for the CFA and B the measurement loadings. e and d are random residuals.

The diagnostics of the model estimated in table 7 provide an excellent fit even though the r-square appears low.[7] The model meets most structural equations criterion of good fit. Thus, it would have been possible to stop here because this is a good fitting model. However, the ICCs signal some untapped variance at the higher level which if explicitly modelled can provide additional insights.

Table 8: Aggregate CFA model with covariates (MIMIC)

DM: Probit		
W_FS_H*	1	999
W_FS_LHP	0.85	0.0%
W_FS_DN	0.53	0.0%
W_FS_VFR	1.15	0.0%

*Fixed to one.

REGRESSION: Dependent DM		
AGE	0.19	4.4%
AGE_D	0.01	0.7%
HEAD	-0.20	25.6%
EDUC	0.06	8.0%
U_R	0.33	0.7%
PROPHEXP	0.08	3.8%
CIRCUCONT	0.09	18.7%
FHR	0.04	24.5%
FWBJ	0.21	0.0%
DBJ	-0.09	0.0%
R-square	0.13	

The model in table 8 can be re-estimated with ethnic dummies. The addition of ethnic dummies raises the r-square by 10 percentage points; however, all other structural equation modelling diagnostics deteriorate (table 9).[8]

---

[7] The structural equation diagnostics are provided with the weighted least square estimator and require logistic regressions to be used to measure the factor. The diagnostics are chi-square pvalue=0.10, CFI=0.93, RMSEA=0.02, WRMR=0.96.

[8] The structural equation diagnostics for the model with ethnic dummies are chi-square pvalue=0.00, CFI=0.62, RMSEA=0.17, WRMR=6.12.

Table 9: Aggregate CFA model with covariates and ethnic dummies (MIMIC)

DM: Probit		
W_FS_H*	1	999
W_FS_LHP	0.834	0.0%
W_FS_DN	0.492	0.0%
W_FS_VFR	1.104	0.0%

*Fixed to one.

REGRESSION: Dependent DM		
AGE	0.21	2.6%
AGE_D	0.02	0.0%
HEAD	-0.15	24.0%
EDUC	0.07	0.1%
U_R	0.32	0.1%
PROPHEXP	0.09	0.2%
CIRCUCONT	0.05	53.4%
FHR	0.05	7.2%
FWBJ	0.20	0.0%
DBJ	-0.09	0.0%
ETN1	0.05	12.9%
ETN2	-0.44	0.0%
ETN4	0.21	2.8%
ETN5	-0.25	0.0%
ETN6	-0.57	0.0%
ETN7	-0.26	0.0%
ETN8	0.56	0.0%
ETN9	-0.27	0.5%
ETN10	-0.65	0.0%
ETN11	-1.32	0.0%
ETN12	-0.07	19.5%
ETN13	1.01	0.0%
ETN14	-1.08	0.0%
ETN15	-0.36	0.1%
ETN16	-0.51	0.0%
ETN17	-0.20	1.2%
ETN18	-0.60	0.0%
ETN19	0.15	0.1%
ETN20	-0.57	0.0%
ETN21	-0.53	0.0%
ETN22	-0.52	0.0%
ETN23	-0.39	0.0%
ETN24	-0.67	0.0%
R-square	0.23	

The base category is etnic3 and includes the following ethnicities
Amara / Gondere, Gayente, Semen, Farte, Gojjame, Dawunte, Wa

Finally, covariates are added to the multilevel CFA model (table 10).

Table 10: Random intercepts MIMIC[9]

Within level decision making factor DM_W: Probit			Between level decision making factor DM_B		
W_FS_H*	1	999	W_FS_H*	1	999
W_FS_LHP	0.94	0.0%	W_FS_LHP	0.76	0.7%
W_FS_DN	0.85	0.1%	W_FS_DN	-0.34	75.8%
W_FS_VFR	1.27	0.0%	W_FS_VFR	0.80	18.7%
*Fixed to one.			*Fixed to one.		
REGRESSION: Dependent DM_W			**REGRESSION: Dependent DM_B**		
AGE	0.28	0.0%	CMU_R	1.30	20.1%
AGE_D	0.02	0.0%	CMEDUC	-0.21	25.5%
HEAD	-0.19	19.3%	CMCIRCUCON	0.31	60.6%
EDUC	0.19	0.0%	CMFHR	-0.84	9.5%
DBJ	-0.02	24.9%	CMFHBJ	-0.49	30.4%
PROPHEXP	0.11	0.2%	CMFWBJ	0.74	0.1%
CIRCUCONT	0.13	20.1%			
R-square	0.10		R-square	0.83	

The random intercepts measurement model with covariates closely resembles the earlier measurement multilevel model. Individual level variables such as age and education have positive coefficients and significant p-values. For household level variables, age difference and proportion of household expenditure by wife are significant and positive. At the institutional level only husband rights (at the 10% level) and wife beating justification answered by the wife (at the 1% level) are significant. The sign of wife beating justification is as expected and positive. Women in ethnic groups where wife beating justification is rejected, women tend to be located on a higher bargaining intercept. However, in ethnic groups where on average men respond "no" to questions concerning their rights over wives, women are positioned on lower decision making intercept. Thus, in ethnic groups where men claim wives have more rights, wives tend to take, everything else equal, less decisions in the household.

Discussion: The Importance of Distinguishing Types of Bargaining Power

The analysis above points out that distinguishing between levels of bargaining determinants matters for the explanation of bargaining power. In our case, we only used a direct measure of bargaining power, so its use for using indirect bargaining power measures, e.g. outcome measures, still needs to be demonstrated. Our models also show that a multi-level analysis seems quite adequate to the empirical

---

[9] Since there was no significant difference with no centrering and grand mean centrering, the former was kept. Some differences are noted when group mean centering is used but the changes have no implications for the interpretations of the results.

analysis of different levels of bargaining determinants. Finally, our analysis of the Ethiopian DHS not only finds that distinguishing the institutional level of bargaining determinants from the individual and household level is relevant, but even suggests that the institutional level is a stronger predictor of women's bargaining power as compared with the other two levels because of the much higher Rsq that that level has.

Conclusion

A policy implication from our paper is that gender policies that attempt to strengthen women's position and support their empowerment may be more effective when shifting the policy priority from providing women with access to resources to tackling the social norms, cultural practices and laws at local levels that negatively affect women's bargaining power. Because only when the institutional environment allows women to turn their resources into more decision making power, women's empowerment will benefit from access to resources.

References

Agarwal, Bina (1994) *A Field of One's Own. Gender and Land Rights in South Asia*. Cambridge: Cambridge University Press.

Agarwal, Bina (1997) '''Bargaining'' and Gender Relations: Within and Beyond the Household', *Feminist Economics* 3 (1), pp. 1-51.

Basu, Kaushik (2006) 'Gender and Say: A Model of Household Behaviour with Endogenously Determined Balance of Power', *Economic Journal* 116, pp. 558-580.

Bentler, Peter, (2006) *EQS 6 Structural Equations Programme Manual*.

Biseswar, Indrawatie (2008) 'Problems of Feminist Leadership among Educated Women in Ethiopia: Taking Stock n the Third Millennium', *Journal of Developing Societies* 24 (2), pp. 125-158.

Blumberg, Rae Lesser (1991) (ed.) *Gender, Family, Economy. The Triple Overlap*. Newbury Park: Sage.

Central Statistical Agency and ORC Macro (2006) Ethiopia Demographic and Health Survey 2005. Addis Ababa and Calverton: Central Statistical Agency and ORC Macro.

Cheung, Mike and Au, Kevin (2005) Applications of multilevel structural equation modelling to cross-cultural research, *Structural Equation Modeling*, 12, pp. 598-619.

Datta, Namita (2006) 'Joint Titling – a Win-Win Policy? Gender and Property Rights in Urban Informal Settlements in Chandigarh, India', *Feminist Economics* 12 (1), pp. 271-298.

Doss, Cheryl (2005) 'The Effects of Intrahousehold Property Ownership on Expenditure Patterns in Ghana', Journal of African Economies 15 (1), pp. 149-180.

Friedberg, Leora, and Anthony Webb (2006) Determinants and Consequences of Bargaining Power in Households. Center for Retirement Research Working Paper nr. 13, Boston College.

Goetz, Annemarie, and R. Sen Gupta (1996) 'Who Takes the Credit? Gender, Power and Control over Loan Use in Rural Credit Programmes in Bangladesh', *World Development* 24 (1), pp. 45-63.

Heck, Ronald and Thomas, Scott (2008) *An Introduction to Multilevel Modelling Techniques*, Routledge.

Hoddinott, John, and Christopher Adam (1998) Testing Nash-Bargaining Household Models with Time-Series Data. FCND Discussion Paper nr. 52. Washington D.C.: International Food Policy Research Institute.

Hox, Joop (2002) *Multilevel Analysis*, Erlbaum.

Koolwal, Gayatri (2005) Gender Inequalities in development: the Impact of Networks and Labor Markets. PhD Dissertation Cornell University.

MacPhail, Fiona, and Xiao-Yuan Dong (2007) 'Women's Market Work and Household Status in Rural China: Evidence from Jiangsu and Shandong in the late 1990s', *Feminist Economics* 13 (3), pp. 93-124.

Muthen, Bengt (2004) *Mplus Technical Appendices*, Muthen and Muthen.

Muthen, Linda (1999) Mplus discussion, website accessed 16/12/2008, Muthen and Muthen..

Muthen, Bengt and Muthen, Linda (2008) Chi-square difference testing using the Satorra-Bentler scaled chi-square, website accessed 16/12/2008, Muthen and Muthen..

Netemeyer, Richard, Bearden, William and Subhash, Sharma (2003) *Scaling Procedures: Issues and Applications*, Sage.

Nikièma, Béatrice, Slim Haddad and Louise Potvin (2008) 'Women Bargaining to Seek healthcare: Norms, Domestic Practices, and Implications in Rural Burkina Faso', *World Development* 36 (4), pp. 608-624.

Orrefice, Sonia, and Brighita Bercea (2007) Quality of Available Mates, Education and Intra-Household Bargaining Power', Fondazione Eni Enrico Mattei Working Papers no. 103. The Berkerley Electronic Press.

Panda, Pradeep, and Bina Agarwal (2005) 'Martial Violence, Human Development and Women's Property Status in India', *World Development* 33 (5), pp. 823-850.

Quisumbing, Agnes (ed.) (2003) Household Decisions, Gender, and Development. A Synthesis of Recent Research. Washington D.C. : IFPRI.

Rahman, A. (1999) 'Micro-credit Initiatives for Equitable and Sustainable Development: Who Pays?', *World Development* 27 (1), pp. 67-82.

Sen, Amartya (1990) 'Gender and Cooperative Conflicts' in Irene Tinker (ed.) *Persistent Inequalities. Women and World Development*. Oxford: Oxford University Press, pp. 123-149.

Snijders, Tom and Bosker, Roel (2004) *Multilevel Analysis*, Sage.

Stapelton, Laura (2006) 'Using multilevel structural equation modelling techniques with complex sample data', in *Structural Equation Modelling*, (eds) Gregory Hancock and Ralph Mueller, Age Publishing.

Stevenson, Betsey and Justin Wolfers (2006) 'Bargaining in the Shadow of the Law: Divorce Laws and Family Distress', *Quarterly Journal of Economics*, 121 (1), pp. 267-288.

Tassel, Eric van (2004) 'Household Bargaining and Micro Finance', *Journal of Development Economics*, 74 (2), pp. 449-468.

Vaughan, Sarah, and Kjetil Tronvoll (2003) The Culture of Power in Contemporary Ethiopian Political Life. SIDA Studies no. 10. Stockholm. SIDA.

van de Vijver, Fons, van Hemert, Dianne, Poortinga, Ype (2008) *Multilevel Analysis of Individuals and Cultures*, Routledge.

WHO (1999) Female Genital Mutilation Programmes to Date: What Works and What Doesn't. report by the Department of Women's Health, Health Systems and Community Health. Geneva: WHO.

Woolley, Frances, and Zhiqi Chen (2001) 'A Cournot-Nash Model of Family Decision Making', *Economic Journal*, 111 (474), pp. 722-748.

Notes