

Measuring Autonomy: Evidence from Bangladesh

Ana Vaz, Sabina Alkire, Agnes Quisumbing and Esha Sraboni

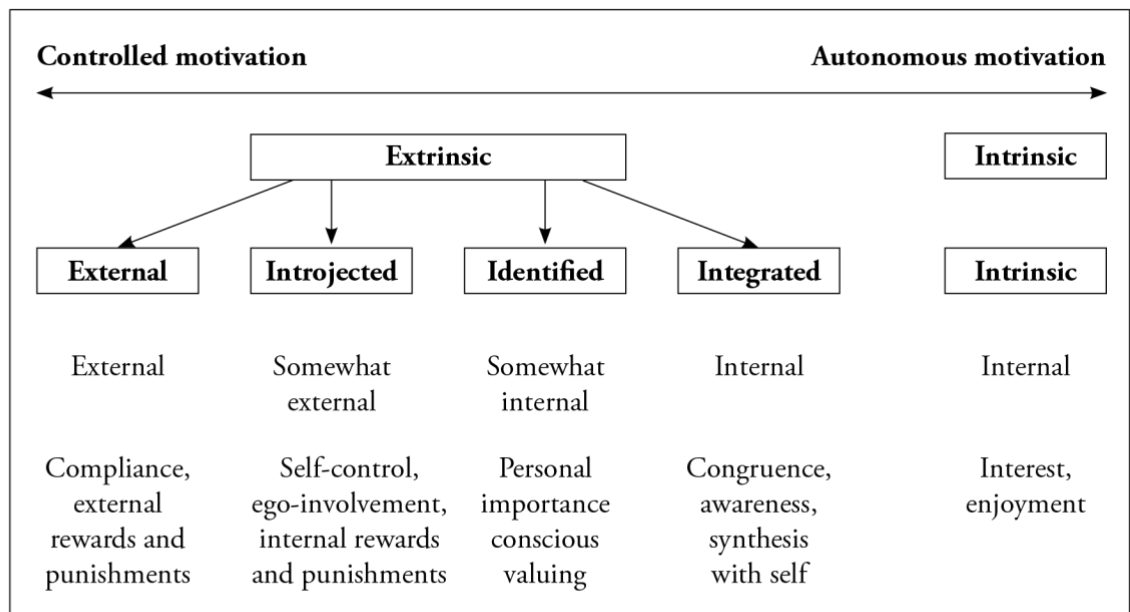
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Online Appendix

This information is organized under the corresponding headings in the paper.

2. Conceptual Framework

Figure A.1 summarizes the conceptual definitions



Note: Based on Ryan and Deci, 2000

4. Conceptual Validity and Reliability

4.1 Conceptual Validity

4.2.1 Dimensional Structure

Exploratory Factor Analysis

We started by performing an Exploratory Factor Analysis (EFA) to investigate if a three-factor solution that discriminates the items of the three motivation subscales emerges. We estimated the polychoric correlation matrix considering the sampling weights and perform the factor analysis using that matrix. To

facilitate the interpretation of the factor loadings we rotated the axes. We used oblique rotation, given that the motivation subscales are likely to be correlated.

First, we considered the full set of items. Probably due to the large number of variables combined with the small size of the sample (there are only 636 individuals who answered the motivation questions for all 13 areas of decision-making), the solution obtained is a Heywood case.¹

Second, we selected a more similar subset of domains of decision-making, in which we expected the motivations to be more correlated. We performed an EFA considering only the areas of decision-making related to agriculture, namely the domains ‘agriculture production’, ‘what inputs to buy’, ‘what crops to grow’, and ‘who and when to take the crops to the market’. The sample under analysis increased from 636 to 4,910 individuals. Considering Kaiser’s eigenvalue-greater-than-one rule, the expected three-factor structure emerged.² As shown in Table A.1, we find that the set of questions that are supposed to measure different subscales are clearly discriminated in different factors. Factors capturing external and introjected subscales are strongly correlated. However, contrary to the theory, the factor capturing the autonomous subscale is much more correlated with the external factor than with the factor capturing the introjected subscale. We obtain similar results if we consider the set of decision-making domains not related to economic activities.³

Table A.1: Results of EFA considering questions related to agriculture

	Sample of men and women			
	Factor1	Factor2	Factor3	
Proportion of variance explained⁽¹⁾	41%	37%	36%	
Factor loadings⁽²⁾				
Variable	Factor1	Factor2	Factor3	Uniqueness
External - Agricultural production	0.9659			0.0729
External - Inputs	0.9582			0.0741
External - Crops	0.9531			0.0774
External - Take crops to markets	0.9081			0.1546
Introjected - Agricultural production			0.8917	0.2070
Introjected - Inputs			0.8934	0.1982
Introjected - Crops			0.8854	0.2078

¹ Using a Pearson correlation matrix instead of the polychoric correlation, the solution obtained is not a Heywood case. In this solution, according to the Kaiser criterion, there are four factors in the data. In the four-factor solution, we find that the factors 1 and 2 discriminate the questions from the subscales external and autonomous, respectively. Factors 3 and 4 cover the introjected subscale, with factor 3 including seven of the 13 questions and factor 4, six.

² An alternative criterion would be the parallel analysis. This procedure proposes retaining all factors with an eigenvalue higher than the eigenvalue obtained from a randomly generated dataset with the same number of variables and observations. Using this criterion we would keep all factors. However, only the first three factors have items with a loading higher than 0.3.

³ We considered the following domains as unrelated to economic activities: minor household expenditures, what to do if you have a serious health problem, how to protect yourself from violence, whether and how to express religious faith, what kind of tasks you will do on a particular day, and whether or not to use family planning to space or limit births.

Introjected - Take crops to markets	0.8225	0.2880
Autonomous - Agricultural production	0.9674	0.0561
Autonomous - Inputs	0.9792	0.0398
Autonomous - Crops	0.9707	0.0570
Autonomous - Take crops to markets	0.9565	0.0925

Correlation matrix of the rotate common factors ⁽³⁾

	Factor 1	Factor 3	Factor 2
External	1		
Introjected	0.430	1	
Autonomous	0.191	0.005	1

⁽¹⁾ Rotated factors are correlated

⁽²⁾ Blanks represent loading below 0.3

⁽³⁾ The order of the factors was changed to replicate the self-determination continuum.

Multiple Correspondence Analysis

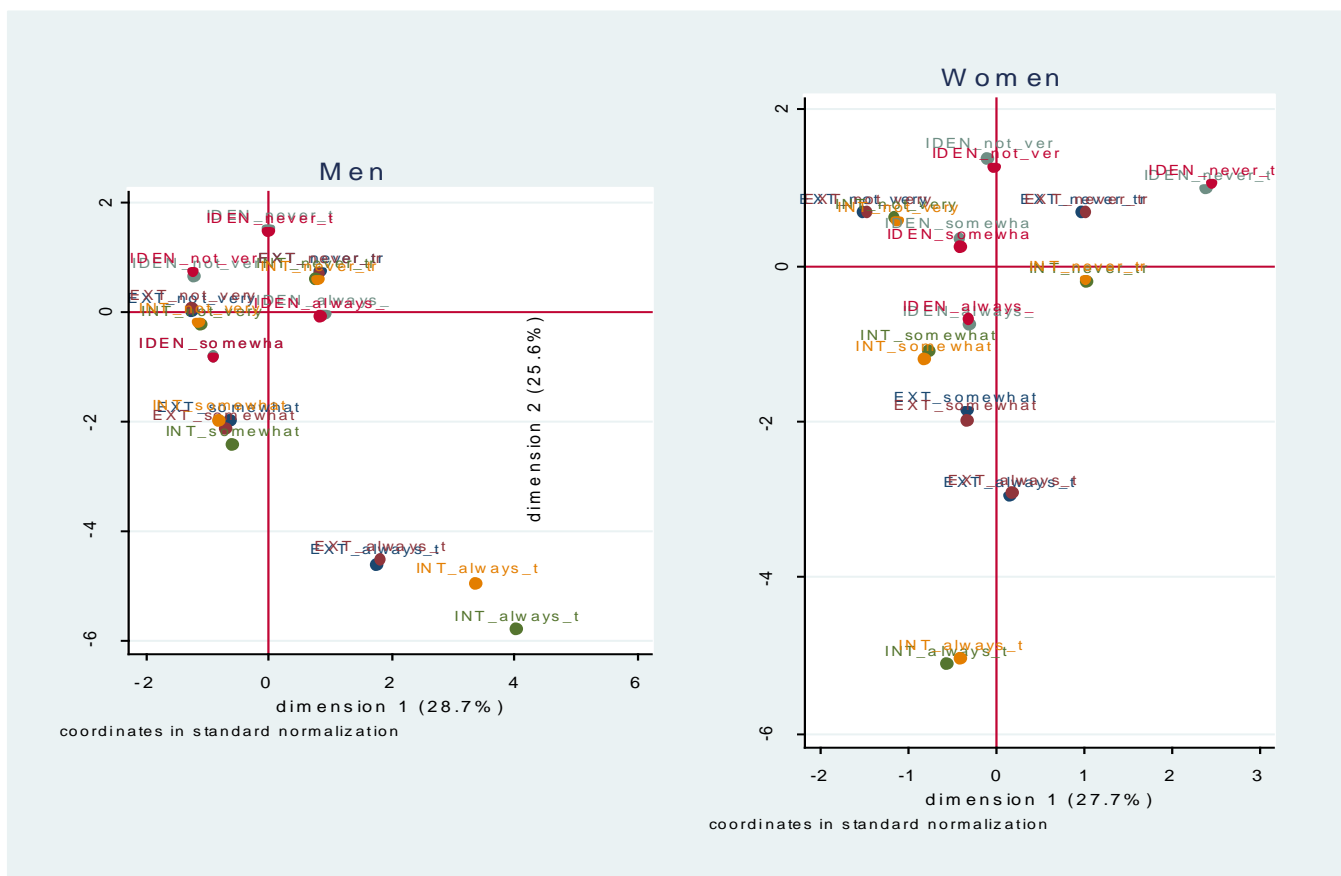
Women's empowerment is known to be multidimensional, with empowerment in one domain such as family not necessarily implying empowerment in another, such as workplace. In the case of the agricultural domains, one might suspect that similar levels of empowerment might be associated with each domain, because they each relate to economic productivity. To explore this further, as well as to further elucidate the relationship among the variables, treating them now as purely categorical, we examined the data structure using a Multiple Correspondence Analysis (MCA). This descriptive method can be seen as a generalization of the principle component analysis to categorical data. In very simple terms, this technique divides each categorical variable into dummy variables that represent the categories of the original variable and describes the pattern of the dataset geometrically by locating each of these 'new' dummy variables in a low-dimensional space.

We performed multiple correspondence analysis using the questions related to agriculture (a smaller set of variables and larger sample of individuals). We performed this analysis separately by gender. In the case of men, we found that three motivations explain 71% of the inertia.⁴ The first dimension explains 28.7%; the second, 26.5%; and the third, 15.3%.⁵ Similarly for women, the percentages of inertia explained by each dimension are: 27.7%, 25.6%, and 12.0%. Figure A.2 plots the point coordinates of items related to 'what inputs to buy' and 'what crops to grow' in dimensions 1 and 2. We did not include items regarding the other two agricultural domains because they tend to overlap, making the reading of the graphic difficult. Thus, we see a similar motivational structure across the agricultural domains by gender.

⁴ The concept of inertia in multiple correspondence analysis is equivalent to variance in factor analysis (Abdi and Valentim, 2007).

⁵ The fourth dimension already only explains 8.7% of the inertia.

Figure A.2: Plot of MCA, questions regarding what inputs to buy and what crops to grow

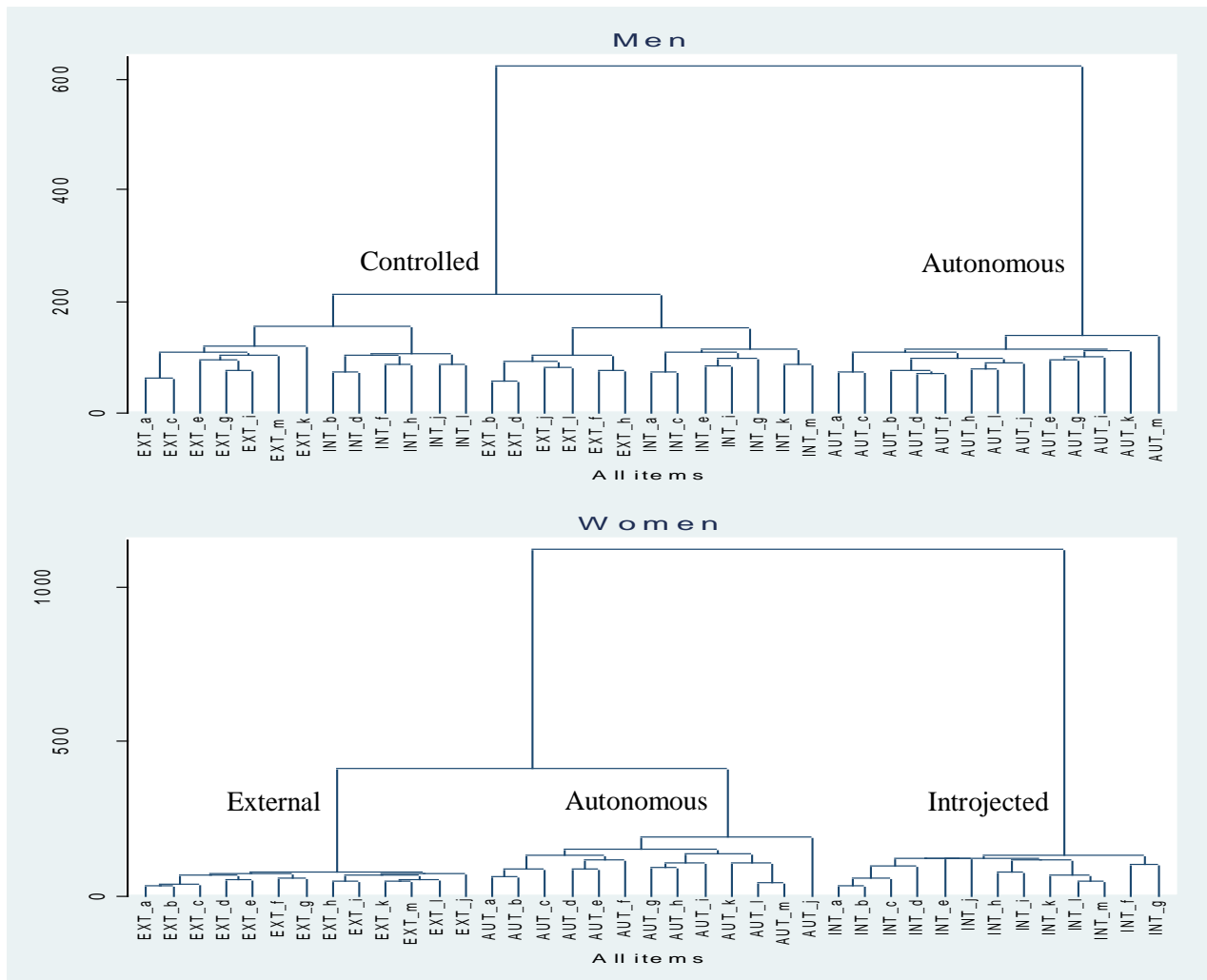


Cluster Analysis

Finally, we examined if a cluster analysis groups the motivation questions according to the type of motivation they are intended to measure. We performed the analysis separately by gender. We computed a proximity matrix based on the squared Euclidean Distance. Then clusters were produced using the hierarchical average linkage method.⁶ We performed this analysis considering the full set of domains initially. The resulting dendrograms are presented in Figure A.3. Second, to be able to draw conclusions based on a larger sample, we conducted a new cluster analysis focusing only on the domains related to agriculture. The respective dendrograms are presented in Figure A.4.

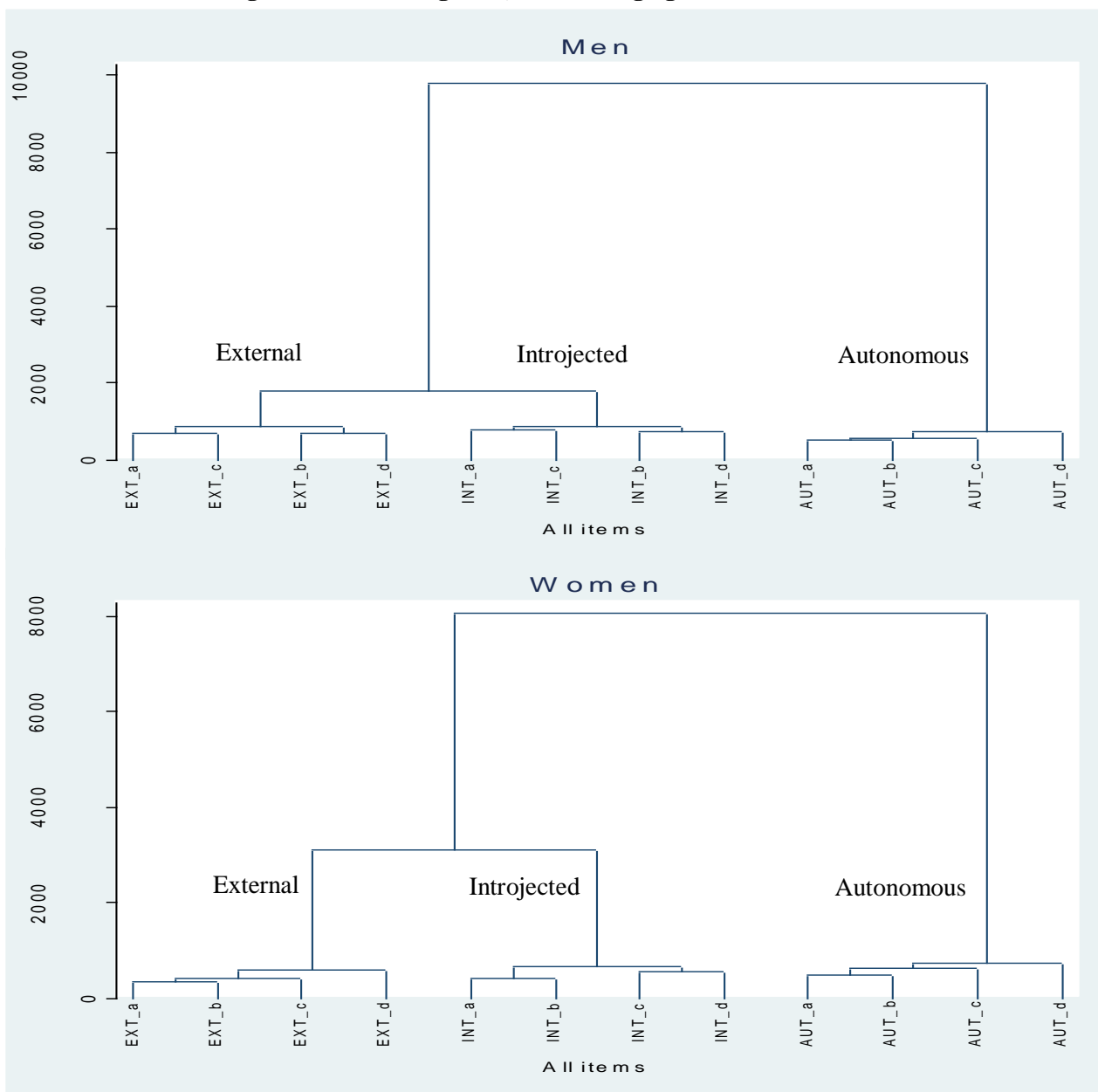
⁶ The cluster analysis was also conducted considering alternative linkage methods, namely, complete linkage and Ward's method. The same structure was identified using the different methods.

Figure A.3: Dendrograms, considering all domains



Note: In the names of the items 'EXT' identifies the external motivation questions, 'INT' identifies the introjected motivation questions and 'AUT' refers to autonomous motivation questions. The letters identify the domains.

Figure A.4: Dendrograms, considering agricultural domains



Note: In the names of the items 'EXT' identifies the external motivation questions, 'INT' identifies the introjected motivation questions, and 'AUT' refers to autonomous motivation questions. The letters identify the domains.

Men

Let's focus first on the case of men. The dendrogram in Figure A.3 suggests that there are two broad clusters that distinguish controlled and autonomous motivations. This two-cluster structure is corroborated by the Calinski-Harabasz stopping rule. According to the Duda-Hart stopping rule, there are five clusters. According to this rule, the autonomous motivation questions are all grouped in the same cluster. The external and introjected questions are divided in two different clusters each. Under this structure, controlled and autonomous motivations are clearly separated, but some external questions are closer to some introjected questions than to other external questions. So the two-cluster controlled-

autonomous structure is validated by Calinski-Harabasz, and the three categories are verified by Duda-Hart, but the external and introjected are interspersed to make five categories.

When considering a more restricted set of domains, the results are similar. The Calinski-Harabasz stopping rule suggests that a two-cluster is the optimal structure. This solution distinguishes between controlled and autonomous motivations, but not between external and introjected motivations. This validates the structure of the negative and positive aspects of autonomy. On the other hand, Duda-Hart stopping rule suggests a three-group solution, distinguishing between the three types of motivations. Thus, the structure of the autonomy measure is validated insofar as the three kinds of motivations, and their positive and negative structure, but the apparent relative position of controlled and introjected motivations differs for some domains.

Women

In the case of women, both Calinski-Harabasz and Duda-Hart stopping rules suggest that a three-group structure is the most distinct hierarchical structure, validating the distinction between controlled, introjected, and autonomous motivations. The three clusters distinguish the three types of questions. When we consider the full set of domains, the two closer clusters are the ones related to external and identified motivation – that is, introjected motivations changed with autonomous motivations. But when we consider the smaller set of questions and the larger sample, we find that the three motivations appear as three clustered, and are presented in the expected ordering.

Overall, the structure that emerges from this analysis corroborates the separation between controlled and autonomous motivations. In the small sample with all domains, the introjected motivations do not always appear in the expected ranking. But in the large sample with a subset of domains, the expected structure is independently ratified.

4.1.2 Correlations within Areas of Decision-making

Table A.2 presents the Spearman and Pearson correlation matrices for each domain, considering the samples of men and women separately.⁷

Table A.2: Matrix of correlations between motivation subscales

	Sample of men							
	Spearman		Pearson (svy)		Spearman		Pearson (svy)	
Agricultural production	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.432***		0.419***		0.199***		0.134**	
Autonomous	0.020	0.002	0.108***	0.062**	0.226***	0.038*	0.264***	0.058*

⁷ Spearman correlation coefficients do not take into account the survey design. The Pearson correlation coefficients displayed were computed pairwise and they take into account the survey design.

What inputs	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.402***		0.393***		0.216***		0.152**	
Autonomous	-0.001	-0.020	0.066**	0.049*	0.253***	0.041**	0.288***	0.060*
What crops to grow	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.435***		0.435***		0.232***		0.159***	
Autonomous	-0.014	-0.067***	0.064**	-0.017	0.241***	0.054***	0.290***	0.073**
Take crops to market	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.431***		0.417***		0.241***		0.174***	
Autonomous	-0.071***	-0.046**	0.012	0.017	0.224***	0.041**	0.274***	0.082***
Livestock raising	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.462***		0.458***		0.315***		0.235***	
Autonomous	-0.015	-0.073**	0.046	-0.022	0.193***	0.051***	0.225***	0.089***
Nonfarm business	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.476***		0.479***		0.175***		0.157**	
Autonomous	-0.097***	-0.062**	-0.002	0.009	0.330***	0.065***	0.351***	0.072*
Wage and employment	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.492***		0.487***		0.238***		0.141**	
Autonomous	-0.026	-0.036*	0.047	0.028	0.244***	0.015	0.290***	0.032
Minor hh expenditures	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.490***		0.485***		0.359***		0.309***	
Autonomous	-0.111***	-0.019	-0.052**	0.019	0.166***	0.065***	0.214***	0.113***
Health	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.470***		0.426***		0.381***		0.307***	
Autonomous	0.051***	-0.021	0.123***	0.040	0.211***	0.059***	0.251***	0.113***
Protect from violence	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.450***		0.477***		0.239***		0.200**	
Autonomous	0.075***	0.041*	0.144***	0.124***	0.182***	-0.061**	0.227***	-0.030
Express religious faith	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.520***		0.504***		0.423***		0.434***	
Autonomous	0.129***	0.039**	0.214***	0.121***	0.185***	0.047***	0.216***	0.097***
Def. of daily tasks	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.502***		0.473***		0.422***		0.350***	
Autonomous	-0.054***	-0.022	0.038*	0.038*	0.173***	0.085***	0.194***	0.138***
Family planning	External	Introj.	External	Introj.	External	Introj.	External	Introj.
Introjected	0.555***		0.571***		0.392***		0.346***	
Autonomous	-0.040**	-0.053***	0.039	0.015	0.161***	0.0158	0.200***	0.074**

Note: * significant at 10%; ** significant at 5%; *** significant at 1%.

4.2 Reliability

We performed an additional test of reliability using nonparametric Item Response Theory (IRT), the Mokken Scale Procedure (MSP). This is ‘an automated item selection procedure for selecting unidimensional scales of polytomous items from multidimensional datasets’ (Hemker, Sijtsma and Molenaar, 1995, p. 337).

The MSP is based on Loevinger's H coefficient. This coefficient corresponds to the observed between-item covariance divided by the maximum possible covariance given the marginal distribution of the two items. The coefficient can be computed for a pair of items i and j (H_{ij}); for item i (H_i), by averaging H_{ij} across j ; and for a whole scale (H), averaging H_i across i . Coefficient H_i may be interpreted as a measure of the discrimination power of item i and, hence, the coefficient H can be seen as a measure of the discrimination of the scale (Sijtsma, Maijer, and Van der Ark, 2011). Mokken (1971) suggested the following rule to describe the quality of a scale:

Loevinger's H	Scale quality
$0 \leq H < 0.3$	Unscalable
$0.3 \leq H < 0.4$	Weak
$0.4 \leq H < 0.5$	Medium
$0.5 \leq H$	Strong

This procedure allows us to test if the questions that are supposed to measure different types of motivation are grouped into different Mokken scales. We assumed a lower bound for Loevinger's H of 0.5. We performed this test considering the full set of domains and restricting the analysis to the domains related to agriculture, analyzing men and women separately.

Men

Considering the full set of items, the MSP identified two scales. The first scale grouped the autonomous motivation questions, and it had an H coefficient of 0.87. The second scale combined all external and introjected motivation questions, and it had an H coefficient of 0.59, so in both cases the scale quality was strong, but the external and introjected questions were grouped together. This dimension structure is very similar to the one reflected by the cluster analysis – but remember it is only for 365 men.

Considering the set of items related to agriculture and the larger sample, the results were much more in line with our measurement model. The MSP identified three scales, each grouping the set of items intended to measure one of the types of motivations. The respective H coefficients varied between 0.67 for introjected motivation and 0.90 for identified motivation, all indicating strong scale quality.

Women

Considering the full set of items and smaller sample, the MSP identified five scales. The first combined all external and identified motivation questions, and had an H coefficient of 0.75. The introjected motivation questions were separated into four different scales. The first of these scales grouped the questions related to agriculture. The second scale grouped the questions regarding expression of religious faith, definition of daily tasks, and family planning. The third scale grouped the domains of household minor expenditures

and health. Finally, the fourth scale grouped the questions regarding non-farming business and own wage and salary employment. The introjected questions regarding raising livestock and protection from violence were not included in any scale. The MSP grouping of indicators is intuitively consistent with different spheres of decision-making in a woman's life. Similar to the case of men, when we only considered the questions related to agriculture and the larger sample, the MSP identified three scales, each grouping the set of items intended to measure one of the types of motivations. The respective H coefficients varied between 0.71 for introjected motivation and 0.91 for external motivation. Thus, for both men and women the Mokken Scale Procedure ranks the scale qualities in their highest category and this procedure, together with the excellent strength of Cronbach's alpha, validates the reliability of the relative autonomy index for both women and men.

5. External Validity

We started by comparing the average autonomy indices across different population subgroups. We defined the groups, splitting the sample in terms of gender, age group, level of education, per capita expenditure quintile, and geographic locations (administrative division). The purpose of this exercise was to investigate if there are population subgroups that are clearly more autonomous than others.

Table A.3 presents the average indicators by gender and the results of the test of equal means across gender. At a significance level of 10%, we reject the null hypothesis in seven of the 13 domains. Men are on average more autonomous in decisions related to economic activities ('what crops to grow', 'when and who to take crops to market', 'non-farming business and own wage and salaried employment'). Women, on the other hand, tend to report higher levels of autonomy in the domains of 'protection from violence', 'expression of religious faith', and 'family planning'. In terms of values of empowerment, the male RAI ranges from 3.23 to 4.43 and the women's RAI varies from 3.39 to 4.55. The domain of 'defining daily tasks' has the highest RAI value for both men and women, and is not significantly different. One also observes gender parity for domains such as decisions regarding minor household expenditures; what to do in health emergencies; and decisions regarding livestock, inputs for agriculture, and agricultural production.

Across domains, men experience the highest autonomy, after defining daily tasks, in activities like minor household expenditures, types of crops to grow, taking crops to market, agricultural inputs, and agricultural production, followed by wage and salary employment. Women's highest RAI after defining daily tasks concerns their expression of religious faith, followed by minor household expenditures, family planning, and agricultural production.

Table A.3: Average RAI by gender

Domains	Male sample		Female sample		Means comparison	
	Mean	Obs	Mean	Obs	Difference	p-value
Agricultural production	4.24	2,886	4.10	2,637	0.14	0.36
Inputs for agriculture	4.25	2,852	4.01	2,599	0.24	0.13
Types of crops to grow	4.29	2,853	4.01	2,620	0.28	0.08
Take crops to market	4.28	2,664	3.94	2,489	0.34	0.03
Livestock raising	4.21	2,813	4.05	3,232	0.16	0.31
Nonfarm business	4.20	2,224	3.39	1,607	0.80	0.00
Wage and salary employment	4.22	2,641	3.71	1,974	0.51	0.00
Minor household expenditures	4.30	4,506	4.24	5,169	0.06	0.63
Health	3.95	3,989	4.04	4,802	-0.10	0.42
Protection from violence	3.23	1,663	4.07	1,526	-0.84	0.00
Express religious faith	3.62	3,850	4.29	3,840	-0.67	0.00
Define daily tasks	4.43	4,268	4.55	5,064	-0.12	0.41
Family planning	3.69	3,401	4.14	4,098	-0.45	0.00

Note: P-values computed using svy command, assuming equal variance across groups.

The means displayed in Table A.4 suggest that in most domains the average autonomy of women increases with age, while in the sample of men the pattern of autonomy usually has a mild u-shape, but reaches the highest value for men in the oldest category in all domains.

Table A.5 presents the average RAIs by education level. In the sample of men, autonomy tends to increase with education. Men with a secondary school education have higher autonomy than the unschooled in every domain except family planning, where autonomy values are equal. The autonomy of men with a primary school education is between the autonomy of the other two groups of men in most domains, except non-farm business, health, religion, defining daily tasks, and family planning. In the sample of women, autonomy in every domain is slightly higher for women who have completed secondary school than for women who have no education. Women with a primary school education have autonomy levels women, autonomy in every domain is slightly higher for women who have completed secondary school than for women who have no education. Women with a primary school education have autonomy levels equal to or between the other education categories in all except three domains: inputs for agriculture, wages and salaries, and protection from violence.

Table A.4: Average RAI by gender and age group

Domains	Sample of men						Sample of women					
	Age < 26		26 ≤ Age ≤ 55		Age > 55		Age < 26		26 ≤ Age ≤ 55		Age > 55	
	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs
Agricultural production	4.17	193	4.15	2,016	4.57	677	4.05	430	4.07	2,020	4.55	187
Inputs for agriculture	4.21	191	4.13	1,998	4.64	663	3.92	436	3.98	1,982	4.54	181
Types of crops to grow	4.21	192	4.16	2,001	4.73	660	3.91	447	3.99	1,992	4.59	181
Take crops to market	4.26	176	4.16	1,868	4.67	620	4.01	432	3.88	1,880	4.38	177
Livestock raising	4.25	189	4.06	1,995	4.68	629	3.88	588	4.06	2,425	4.46	219
Nonfarm business	3.88	150	4.23	1,686	4.15	388	3.08	348	3.49	1,173	3.18	86
Wage and salary employment	4.50	248	4.11	1,962	4.59	431	3.45	424	3.76	1,417	4.02	133
Minor household expenditures	4.35	384	4.23	3,143	4.53	979	3.94	1054	4.30	3,698	4.40	417
Health	4.12	344	3.85	2,782	4.23	863	3.82	976	4.09	3,455	4.14	371
Protection from violence	3.10	131	3.11	1,189	3.75	343	4.02	297	4.10	1,123	3.83	106
Express religious faith	3.53	307	3.49	2,665	4.06	878	4.20	775	4.28	2,769	4.65	296
Define daily tasks	4.25	365	4.37	2,979	4.67	924	4.36	1060	4.57	3,604	4.82	400
Family planning	4.04	205	3.65	2,623	3.80	573	4.12	954	4.15	2,993	3.91	151

Table A.5: Average RAI by education level

Domains	Sample of men						Sample of women					
	No edu		Primary		Secondary		No edu		Primary		Secondary	
	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs
Agricultural production	4.19	1,400	4.21	693	4.35	665	3.95	1,264	4.21	710	4.25	633
Inputs for agriculture	4.11	1,392	4.33	684	4.47	653	3.85	1,259	4.15	696	4.12	613
Types of crops to grow	4.20	1,394	4.33	683	4.47	652	3.82	1,265	4.15	705	4.20	619
Take crops to market	4.18	1,290	4.35	615	4.41	634	3.77	1,207	4.09	664	4.09	589
Livestock raising	4.12	1,428	4.27	668	4.34	613	4.03	1,626	4.03	857	4.14	718
Nonfarm business	4.13	1,061	4.02	553	4.47	519	3.25	804	3.38	416	3.69	371
Wage and salary employment	4.05	1,442	4.17	624	4.60	480	3.60	1,056	3.84	504	3.78	381
Minor household expenditures	4.16	2,237	4.38	1,077	4.49	995	4.19	2,498	4.26	1,371	4.27	1,233
Health	3.92	1,970	3.88	937	4.06	904	3.98	2,327	4.06	1,268	4.09	1,145
Protection from violence	3.00	776	3.20	391	3.55	405	3.76	751	4.47	379	4.22	378
Express religious faith	3.60	1,882	3.50	926	3.67	873	4.11	1,925	4.40	963	4.46	901
Define daily tasks	4.38	2,100	4.50	1,020	4.48	957	4.48	2,433	4.58	1,344	4.61	1,219
Family planning	3.70	1,704	3.63	809	3.70	748	3.98	1,755	4.18	1,174	4.34	1,106

Table A.6 presents the average RAIs by per capita expenditure quintile. The autonomy of both men and women in all domains increases with the level of expenditure of the household indicating a positive correlation between autonomy and expenditure. Comparing also across gender, men in the highest quintile have the highest level of autonomy (higher than women in the highest quintile) in all domains except family planning, definition of daily tasks, and the expression of religious faith. Men in the lowest quintile, interestingly, have the lowest autonomy (lower than women in the lowest quintile) in every single domain except nonfarm business.

Table A.7 presents the average RAIs by geographical division. Men in Khulna have the highest RAI in all domains except religion, and men living in Rangpur have the lowest RAI in all domains except minor household expenditures, religion, and family planning. Rajshahi has the second lowest achievements in all levels (and the lowest in the three domains mentioned above). Furthermore, the range in male autonomy is remarkably high, with male autonomy rates above 6 for nine domains in Khulna, and below 2.2 in 10 domains of Rangpur. Therefore, male autonomy is strongly regional.

Among women, the range of RAI across divisions is lower. Khulna still has the highest autonomy in eight domains and Rangpur the lowest in seven, with Rajshahi also showing low autonomy. However interestingly, in Barisal, women have the highest autonomy of all divisions in three domains, and the lowest in two others, showing quite a polarized setting.

Table A.6: Average RAI by per capita expenditure quintile

Indicators	Sample of men						Sample of women					
	Lowest		Middle		Highest		Lowest		Middle		Highest	
	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs
Agricultural production	3.25	449	4.48	603	5.04	593	3.83	435	4.12	548	4.42	577
Inputs for agriculture	3.39	443	4.46	596	5.04	583	3.54	431	4.19	538	4.34	564
Types of crops to grow	3.41	444	4.50	596	5.07	583	3.62	441	4.10	539	4.33	567
Take crops to market	3.22	403	4.57	548	4.97	555	3.48	421	4.05	504	4.44	557
Livestock raising	3.23	501	4.46	589	4.99	537	3.80	631	4.06	647	4.58	613
Nonfarm business	3.30	389	4.41	453	4.98	468	2.75	303	3.51	320	4.08	321
Wage and salary employment	3.53	637	4.53	576	5.43	346	3.67	466	3.53	408	4.35	338
Minor household expenditures	3.62	843	4.51	928	4.91	888	4.09	984	4.34	1,044	4.53	1,094
Health	3.22	747	4.17	843	4.54	772	3.81	912	4.15	954	4.30	1,018
Protection from violence	1.92	289	3.29	338	4.57	349	3.98	274	4.18	307	4.42	341
Express religious faith	3.04	690	3.94	792	3.99	768	4.05	753	4.37	745	4.95	800
Define daily tasks	3.74	788	4.68	876	5.00	856	4.21	964	4.65	1,006	5.06	1,076
Family planning	3.25	672	3.96	731	4.20	604	3.89	813	4.17	855	4.62	787

Table A.7: Average RAI by region

	Sample of men							Sample of women						
	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet
Agricultural production	3.79	4.92	4.99	6.13	3.08	1.88	5.14	4.94	3.57	4.58	5.49	3.68	3.02	3.65
Inputs for agriculture	3.30	4.84	5.03	6.33	2.92	2.08	5.17	4.83	3.50	4.73	5.35	3.44	2.84	3.61
Types of crops to grow	3.47	5.06	5.07	6.34	2.93	1.90	5.46	4.67	3.31	4.84	5.55	3.48	2.85	3.29
Take crops to market	3.49	4.85	5.18	6.39	2.70	2.12	5.61	4.49	3.46	5.01	5.56	3.13	2.59	3.35
Livestock raising	3.73	5.12	4.91	6.23	2.94	2.24	5.12	2.06	3.67	5.30	5.48	3.11	2.88	3.92
Nonfarm business	3.46	5.27	5.25	6.57	2.55	1.90	5.08	4.57	2.87	4.15	5.70	2.89	2.11	2.57
Wage and employment	3.99	5.72	5.04	6.60	2.46	1.96	4.54	5.86	3.40	4.67	5.30	2.25	2.35	3.58
Minor hh expenditures	3.64	5.07	4.92	6.29	2.33	2.63	5.07	3.51	3.81	5.30	5.35	3.13	3.21	4.00
Health	3.68	4.49	4.84	5.58	2.59	2.18	3.22	3.29	3.47	5.10	5.25	3.00	2.90	4.31
Protection from violence	3.22	4.36	4.59	4.95	0.98	0.89	2.34	5.96	2.93	5.22	5.33	3.92	1.96	5.53
Express religious faith	3.41	5.07	4.83	4.53	0.81	2.07	2.91	6.21	4.56	4.79	5.63	3.15	3.21	4.45
Define daily tasks	3.54	5.22	5.02	6.12	2.99	2.56	4.35	2.57	4.35	5.65	5.84	3.43	3.31	4.49
Family planning	3.21	4.96	4.75	5.05	1.60	1.95	3.82	2.69	4.03	5.42	5.22	2.61	3.10	4.40

Note: Values in bold correspond to the highest regional average.

5.1 Correlations

Tables A.8 and A.9 present the Spearman and Kendall tau rank correlation coefficients between the domain-specific relative autonomy indicators and a set of common proxies of empowerment.

Table A.8: Spearman correlations between RAI and other indicators

RAI	General functioning		Empowerment			Agency		Domain-specific functionings	
	Education	Income	Make important decisions	Mobility	Contact friends & relatives	Make changes in community	Influence in community	Feel make decisions	Satisfaction with decisions
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Sample of men									
Agricultural production	0.01	0.14***	0.18***	0.23***	0.31***	-0.03*	0.05**	0.08***	0.38***
Purchase inputs	0.02	0.13***	0.18***	0.24***	0.33***	-0.04**	0.05***	0.06***	0.40***
Decide on crops	0.02	0.12***	0.17***	0.23***	0.30***	-0.04*	0.04**	0.07***	0.41***
Take crops to markets	0.01	0.12***	0.19***	0.24***	0.31***	-0.01	0.06***	0.07***	0.42***
Livestock raising	0.02	0.15***	0.18***	0.22***	0.30***	0.00	0.07***	0.10***	0.39***
Non-farm activity	0.01	0.14***	0.21***	0.25***	0.31***	0.01	0.09***	0.05**	0.42***
Wage and employment	0.06***	0.15***	0.21***	0.23***	0.31***	-0.04**	0.03	0.09***	0.48***
Minor hh expenditures	0.03**	0.12***	0.17***	0.21***	0.27***	-0.02	0.02	0.04**	0.36***
Health	0.01	0.11***	0.18***	0.24***	0.25***	0.04**	0.08***	0.06***	0.39***
Protection from violence	0.04*	0.22***	0.15***	0.16***	0.25***	0.17***	0.12***	-0.02	0.38***
Religious faith	0.01	0.09***	0.10***	0.14***	0.15***	-0.10***	0.00	0.03	0.24***
Daily tasks	0.00	0.10***	0.12***	0.20***	0.27***	-0.05***	0.01	0.07***	0.37***
Family planning	0.00	0.07***	0.14***	0.22***	0.21***	-0.02	0.01	0.09***	0.27***
Panel B: Sample of women									
Agricultural production	0.04**	0.07***	0.17***	0.11***	0.08***	0.10***	0.06***	0.04**	0.31***
Purchase inputs	0.04*	0.09**	0.20***	0.13***	0.10***	0.08***	0.08***	0.06***	0.32***
Decide on crops	0.04**	0.08***	0.18***	0.12***	0.09***	0.08***	0.08***	0.06***	0.33***
Take crops to markets	0.03*	0.09***	0.19***	0.11***	0.11***	0.11***	0.08***	0.09***	0.32***
Livestock raising	-0.01	0.06***	0.12***	0.05***	0.05***	0.09***	0.08***	0.09***	0.36***
Non-farm activity	0.05*	0.12***	0.15***	0.10***	0.07***	0.12***	0.07***	0.06**	0.32***
Wage and employment	0.02	0.03	0.10***	0.06***	0.05**	0.03	0.01	0.07***	0.31***
Minor hh expenditures	0.01	0.05***	0.13***	0.06***	0.04***	0.08***	0.08***	0.07***	0.35***
Health	0.00	0.04***	0.14***	0.08***	0.07***	0.06***	0.09***	0.03**	0.33***
Protection from violence	0.06**	0.04*	0.08***	0.06**	0.14***	-0.01	-0.04	0.15***	0.35***
Religious faith	0.05***	0.09***	0.08***	0.04**	-0.02	0.10***	0.05***	0.05***	0.33***
Daily tasks	0.01	0.07***	0.08***	0.03**	0.04***	0.08***	0.05***	0.10***	0.32***
Family planning	0.02	0.05***	0.12***	0.04***	0.02	0.09***	0.11***	0.01	0.36***

Note: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.9: Kendall Tau correlations between RAI and other indicators

RAI	General functioning		Empowerment			Agency		Domain-specific functionings	
	Education	Income	Make important decisions	Mobility	Contact friends & relatives	Make changes in community	Influence in community	Feel make decisions	Satisfaction with decisions
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Sample of men									
Agricultural production	0.01	0.09***	0.12***	0.15***	0.20***	-0.02	0.03**	0.03***	0.24***
Purchase inputs	0.01	0.08***	0.12***	0.16***	0.21***	-0.02**	0.03***	0.02***	0.25***
Decide on crops	0.01	0.08***	0.11***	0.14***	0.20***	-0.02*	0.03**	0.02***	0.26***
Take crops to markets	0.01	0.08***	0.12***	0.15***	0.20***	-0.01	0.04***	0.02***	0.26***
Livestock raising	0.01	0.10***	0.12***	0.14***	0.20***	0.00	0.05***	0.05***	0.25***
Non-farm activity	0.01	0.09***	0.14***	0.16***	0.20***	0.00	0.06***	0.02**	0.26***
Wage and employment	0.03***	0.10***	0.14***	0.15***	0.20***	-0.02**	0.02	0.03***	0.30***
Minor hh expenditures	0.02**	0.07***	0.11***	0.14***	0.18***	-0.01	0.01	0.02**	0.23***
Health	0.00	0.07***	0.12***	0.15***	0.16***	0.02**	0.05***	0.03***	0.25***
Protection from violence	0.03*	0.14***	0.10***	0.10***	0.16***	0.11***	0.08***	-0.01	0.24***
Religious faith	0.01	0.06***	0.06***	0.09***	0.10***	-0.06***	0.00	0.01	0.15***
Daily tasks	0.00	0.07***	0.08***	0.13***	0.18***	-0.03***	0.01	0.02***	0.23***
Family planning	0.00	0.05***	0.09***	0.14***	0.14***	-0.01	0.01	0.05***	0.17***
Panel B: Sample of women									
Agricultural production	0.02**	0.05***	0.11***	0.07***	0.05***	0.05***	0.04***	0.02**	0.18***
Purchase inputs	0.02*	0.06***	0.13***	0.08***	0.07***	0.05***	0.05***	0.04***	0.19***
Decide on crops	0.03**	0.05***	0.11***	0.07***	0.06***	0.04***	0.05***	0.03***	0.20***
Take crops to markets	0.02*	0.06***	0.12***	0.07***	0.07***	0.06***	0.05***	0.05***	0.19***
Livestock raising	-0.01	0.04***	0.07***	0.03***	0.03***	0.05***	0.05***	0.04***	0.21***
Non-farm activity	0.03*	0.08***	0.10***	0.07***	0.05***	0.07***	0.04***	0.03**	0.20***
Wage and employment	0.01	0.02	0.06***	0.04***	0.03**	0.01	0.01	0.04***	0.19***
Minor hh expenditures	0.00	0.03***	0.09***	0.04***	0.03***	0.04***	0.05***	0.04***	0.21***
Health	0.00	0.03***	0.09***	0.05***	0.04***	0.03***	0.06***	0.02**	0.19***
Protection from violence	0.04**	0.03*	0.05***	0.04**	0.09***	-0.01	-0.03	0.08***	0.21***
Religious faith	0.03***	0.06***	0.05***	0.02**	-0.02	0.05***	0.03***	0.02***	0.18***
Daily tasks	0.00	0.04***	0.05***	0.02**	0.03***	0.04***	0.03***	0.03***	0.17***
Family planning	0.01	0.03***	0.08***	0.03***	0.01	0.05***	0.07***	0.00	0.19***

Note: * significant at 10%; ** significant at 5%; *** significant at 1%.

5.2 Regression Analysis

5.2.1 Empirical Specification

We list below the covariates included in Equations (1) and (2)

The vector \mathbf{X}_i includes:

- the individual's age,
- dummy variables that assume the value of one
 - o if the individual is the head of the household;
 - o if the respondent is married;
 - o if the household head's occupation is related to agriculture (farming, fishing or fish raising, and livestock and poultry raising)
- the number of household members; and
- the number of household members younger than six years old.

The vector \mathbf{F}_i includes:

- individual's education measured as years of schooling;⁸
- a dummy that equals one if the individual's occupation is related to agriculture; and
- an indicator of health that equals one if respondent can easily 'stand up after sitting down', 'walk for 5 km' and 'carry 20 liters of water for 20 meters'.

The vector \mathbf{H}_i includes:

- housing quality indicators, namely
 - o an indicator of sanitation,⁹
 - o drinking water,¹⁰ and
 - o cooking fuel.¹¹
- three asset dummies,
 - o one proxying for access to information (equal to one if household has a TV, radio, phone, or mobile phone),
 - o another for support of mobility (equal to one if household owns a bicycle, rickshaw, van, boat, or motorbike), and
 - o another for support of livelihood (equal to one if household owns livestock or cultivable land); and
- per capita expenditure quintile to which the household belongs.¹²

8 Measuring education level with dummies for level of education achieved instead of years of schooling does not affect the conclusions presented below.

9 Dummy equals one if household members use pucca, or sanitary toilet with or without flush.

10 Dummy equals one if source of drinking water is piped water, own tube well, rain water, or deep tube well for irrigation.

11 Dummy equals one if main source of cooking fuel is electricity, supply gas, LPG, or kerosene.

12 The housing characteristics and assets dummies capture whether the household has basic conditions and assets. The per capita expenditure quintile proxies the relative position of the household in terms of income. The highest correlations of per capita expenditure quintile are with sanitation (0.28), cooking fuel (0.11), assets for access to information (0.26) and assets for support to livelihood (0.10). None of these correlations is likely to lead to multicollinearity problems.

The summary statistics of all the variables used are presented in Table A.10.

Table A.10: Summary statistics

Variables	Sample of men					Sample of women				
	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max
Dependent variables										
RAI in domains:										
Agricultural production	2,886	4.24	3.52	-7	9	2,637	4.10	3.25	-9	9
What inputs for agriculture	2,852	4.25	3.55	-8	9	2,599	4.01	3.29	-9	9
What types of crops to grow	2,853	4.29	3.63	-6	9	2,620	4.01	3.24	-9	9
Who/when to take crops to market	2,664	4.28	3.68	-6	9	2,489	3.94	3.36	-9	9
Livestock raising	2,813	4.21	3.62	-9	9	3,232	4.05	3.49	-9	9
Nonfarming business activities	2,224	4.20	3.71	-8	9	1,607	3.39	3.33	-9	9
Wage and salary employment	2,641	4.22	3.61	-8	9	1,974	3.71	3.29	-9	9
Minor household expenditures	4,506	4.30	3.67	-8	9	5,169	4.24	3.40	-9	9
Deal with serious health problems	3,989	3.95	3.55	-9	9	4,802	4.04	3.35	-9	9
Protection from violence	1,663	3.23	3.52	-9	9	1,526	4.07	3.19	-9	9
Expression of religious faith	3,850	3.62	3.72	-9	9	3,840	4.29	3.48	-9	9
Definition of daily tasks	4,268	4.43	3.60	-8	9	5,064	4.55	3.42	-9	9
Family planning	3,401	3.69	3.83	-9	9	4,098	4.14	3.53	-9	9
General indicators of empowerment										
Power to make important decisions	4,571	6.41	2.12	1	10	5,498	6.14	2.19	1	10
Possibilities to go to other places	4,571	6.01	2.19	1	10	5,498	6.13	2.13	1	10
Contact with friends and relatives	4,571	6.21	2.18	1	10	5,498	6.60	2.26	1	10
Domain-specific indicators about decision-making										
Feel can make decisions in domains:										
Agricultural production	4,571	0.76	0.43	0	1	5,498	0.29	0.46	0	1
What inputs for agriculture	4,571	0.76	0.43	0	1	5,498	0.30	0.46	0	1
What types of crops to grow	4,571	0.76	0.43	0	1	5,498	0.31	0.46	0	1
Who/when to take crops to market	4,571	0.75	0.44	0	1	5,498	0.31	0.46	0	1
Livestock raising	4,571	0.68	0.47	0	1	5,498	0.54	0.50	0	1
Nonfarming business activities	4,571	0.68	0.47	0	1	5,498	0.23	0.42	0	1
Wage and salary employment	4,571	0.73	0.45	0	1	5,497	0.30	0.46	0	1
Minor household expenditures	4,571	0.84	0.37	0	1	5,496	0.60	0.49	0	1
Deal with serious health problems	4,571	0.71	0.45	0	1	5,497	0.50	0.50	0	1
Protection from violence	4,571	0.45	0.50	0	1	5,497	0.18	0.38	0	1
Expression of religious faith	4,571	0.86	0.34	0	1	5,496	0.65	0.48	0	1
Definition of daily tasks	4,571	0.91	0.28	0	1	5,496	0.84	0.36	0	1
Family planning	4,571	0.53	0.50	0	1	5,493	0.65	0.48	0	1
Satisfaction with decisions made in domains:										
Agricultural production	2,964	4.14	0.99	1	5	2,768	4.30	0.90	1	5
What inputs for agriculture	2,928	4.10	0.99	1	5	2,715	4.26	0.89	1	5
What types of crops to grow	2,932	4.13	0.96	1	5	2,725	4.26	0.90	1	5
Who/when to take crops to market	2,743	4.09	0.98	1	5	2,584	4.22	0.90	1	5
Livestock raising	2,879	4.14	0.93	1	5	3,213	4.42	0.76	1	5
Nonfarming business activities	2,308	4.11	0.97	1	5	1,607	4.24	0.85	1	5
Wage and salary employment	2,705	4.12	0.89	1	5	2,044	4.17	0.88	1	5
Minor household expenditures	4,521	4.17	0.90	1	5	5,201	4.46	0.74	1	5
Deal with serious health problems	4,029	4.05	0.95	1	5	4,846	4.37	0.79	1	5
Protection from violence	1,756	3.97	0.90	1	5	1,589	4.17	0.92	1	5
Expression of religious faith	3,879	4.28	0.87	1	5	3,804	4.55	0.70	1	5
Definition of daily tasks	4,289	4.29	0.82	1	5	5,059	4.57	0.69	1	5
Family planning	3,438	4.27	0.81	1	5	4,106	4.60	0.71	1	5

Table A.10: Summary statistics (cont.)

Variables	Sample of men					Sample of women				
	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max
Individual and household characteristics										
Age (in years)	4,571	44.43	13.82	14	95	5,498	36.71	11.57	6	99
Household head (=1, 0 otherwise)	4,571	0.96	0.20	0	1	5,498	0.13	0.33	0	1
Marital status (=1 if married, 0 otherwise)	4,571	0.95	0.21	0	1	5,498	0.95	0.23	0	1
Household size	4,566	4.87	1.78	2	17	5,498	4.73	1.78	1	17
No. of household members < 6 years old	4,571	0.66	0.74	0	6	5,498	0.66	0.75	0	6
Household head occupation is related to agriculture (farming, fishing, or livestock/poultry raising)	4,571	0.45	0.50	0	1	5,498	0.43	0.50	0	1
Years of education	4,571	3.39	4.05	0	16	5,497	3.22	3.57	0	16
Health (=1 if can easily 'stand up after sitting down', 'walk for 5 km' and 'carry 20 litres of water for 20 meters', 0 otherwise)	4,567	3.95	1.85	3	12	5,495	4.26	1.92	3	12
Occupation related to agriculture (=1 if farming, fishing, or livestock/poultry raising, 0 otherwise)	4,570	0.44	0.50	0	1	5,498	0.50	0.50	0	1
Occupation housewife (=1, 0 otherwise)	4,570	0.00	0.00	0	0	5,498	0.42	0.49	0	1
Household members use pucca, or sanitary with or without flush (=1, 0 otherwise)	4,566	0.26	0.44	0	1	5,498	0.27	0.44	0	1
Source of drinking water is piped water, own tube well, rain water, or deep tube well for irrigation (=1, 0 otherwise)	4,571	0.88	0.33	0	1	5,498	0.87	0.33	0	1
Main source of cooking fuel is electricity, supply gas, LPG, or kerosene (=1, 0 otherwise)	4,571	0.03	0.17	0	1	5,498	0.03	0.17	0	1
Household owns a TV, a radio, a phone, or a mobile phone (=1, 0 otherwise)	4,571	0.79	0.41	0	1	5,498	0.78	0.41	0	1
Household owns a bicycle, a rickshaw, a van, a boat, or a motorbike (=1, 0 otherwise)	4,571	0.42	0.49	0	1	5,498	0.39	0.49	0	1
Household owns livestock or cultivable land (=1, 0 otherwise)	4,571	0.66	0.48	0	1	5,498	0.63	0.48	0	1
Per capita expenditure quintile	4,566	2.89	1.40	1	5	5,498	2.91	1.41	1	5
Division dummy 1 (Barisal)	4,566	0.06	0.24	0	1	5,498	0.06	0.24	0	1
Division dummy 2 (Chittagong)	4,566	0.15	0.36	0	1	5,498	0.18	0.39	0	1
Division dummy 3 (Dhaka)	4,566	0.29	0.45	0	1	5,498	0.28	0.45	0	1
Division dummy 4 (Khulna)	4,566	0.12	0.33	0	1	5,498	0.12	0.32	0	1
Division dummy 5 (Rajshahi)	4,566	0.17	0.37	0	1	5,498	0.15	0.36	0	1
Division dummy 6 (Rangpur)	4,566	0.14	0.34	0	1	5,498	0.13	0.34	0	1
Division dummy 7 (Sylhet)	4,566	0.07	0.26	0	1	5,498	0.07	0.26	0	1

5.2.2 Results

Table A.11 displays the estimates of Equation (1) using an ordered probit.

Table A.11. Estimates of Equation (1) using an ordered probit model

Variables	Domains							
	Agriculture production		Livestock raising		Non-farming business activity		Protection from violence	
	Men	(2)	Men	Women	Men	Women	Men	Women
Age	0.003 (0.002)	0.002 (0.003)	0.002 (0.002)	0.000 (0.002)	-0.000 (0.002)	-0.001 (0.003)	0.000 (0.002)	0.005 (0.004)
Household head	0.098 (0.188)	0.012 (0.087)	-0.062 (0.155)	0.023 (0.078)	0.250 (0.171)	0.142 (0.126)	0.143 (0.191)	0.262*** (0.083)
No. of household members	0.032* (0.017)	0.009 (0.018)	0.020 (0.019)	-0.025 (0.018)	0.056*** (0.017)	0.015 (0.025)	0.033 (0.020)	-0.004 (0.023)
No. of members <6	0.067* (0.036)	0.070* (0.041)	0.082** (0.038)	0.034 (0.038)	-0.031 (0.040)	-0.131*** (0.041)	0.003 (0.048)	0.086 (0.055)
Years of education	-0.007 (0.006)	0.008 (0.008)	-0.012* (0.007)	-0.004 (0.007)	-0.013* (0.007)	0.004 (0.010)	-0.001 (0.007)	0.026** (0.011)
Occupation in agriculture	0.120 (0.207)	-0.229*** (0.062)	-0.025 (0.222)	-0.158*** (0.053)	0.246 (0.214)	-0.103 (0.070)	-0.066 (0.270)	-0.196** (0.080)
Sanitation	-0.169*** (0.062)	0.116* (0.061)	-0.073 (0.072)	0.150** (0.061)	-0.064 (0.075)	0.103 (0.078)	-0.364*** (0.096)	0.175** (0.088)
Cooking fuel	-0.300** (0.140)	-0.212 (0.135)	-0.024 (0.152)	-0.115 (0.122)	-0.375** (0.171)	-0.062 (0.193)	-0.159 (0.181)	-0.306 (0.191)
Assets - Access to information	0.134** (0.061)	0.072 (0.067)	0.028 (0.062)	0.037 (0.058)	0.090 (0.062)	0.156** (0.079)	-0.000 (0.066)	0.058 (0.084)
Assets - Support of mobility	0.037 (0.050)	-0.055 (0.052)	0.040 (0.052)	0.014 (0.050)	-0.004 (0.055)	0.168*** (0.065)	-0.019 (0.056)	0.131* (0.080)
Assets - Support of livelihood	0.069 (0.055)	0.049 (0.054)	0.187** (0.073)	0.237*** (0.063)	-0.016 (0.055)	0.008 (0.068)	-0.054 (0.068)	0.147* (0.079)
Household expenditure p.c.	0.109*** (0.021)	0.008 (0.022)	0.103*** (0.023)	-0.010 (0.021)	0.097*** (0.023)	-0.003 (0.028)	0.162*** (0.027)	-0.053** (0.027)
Barisal	-0.396** (0.173)	0.215 (0.293)	-0.352** (0.164)	-0.920*** (0.220)	-0.536*** (0.177)	0.155 (0.300)	-0.432*** (0.166)	0.276 (0.243)
Chittagong	-0.002 (0.168)	-0.408*** (0.124)	0.051 (0.165)	-0.551*** (0.144)	0.013 (0.146)	-0.467*** (0.172)	-0.092 (0.206)	-0.915*** (0.164)
Khulna	0.428*** (0.134)	0.341*** (0.123)	0.490*** (0.132)	0.027 (0.109)	0.514*** (0.143)	0.438*** (0.144)	0.160 (0.135)	-0.078 (0.156)
Rajshahi	-0.528*** (0.159)	-0.229 (0.223)	-0.530*** (0.165)	-0.652*** (0.204)	-0.726*** (0.161)	-0.445* (0.251)	-1.057*** (0.149)	-0.459* (0.279)
Rangpur	-0.805*** (0.120)	-0.434*** (0.122)	-0.672*** (0.136)	-0.752*** (0.117)	-0.862*** (0.128)	-0.690*** (0.147)	-1.002*** (0.135)	-1.190*** (0.138)
Sylhet	-0.002 (0.127)	-0.305* (0.163)	0.026 (0.120)	-0.404** (0.166)	-0.137 (0.131)	-0.529** (0.213)	-0.689*** (0.193)	0.092 (0.154)
F-statistic	9.12***	4.41***	6.05***	5.12***	6.53***	6.87***	10.83***	7.41***
No. of observations	2,882	2,636	2,809	3,231	2,222	1,607	1,660	1,524

Note: The table does not include the estimates of explanatory variables that are not significant in any of the regressions presented, namely, occupation of household head, nutrition, and drinking water. *** p<0.01, ** p<0.05, * p<0.1

Tables A.12.1 (sample of men) and A.12.2 (sample of women) display the estimates of Equation (2) using an ordered probit.

Table 12.1: Estimates of Equation (2) using an ordered probit– Sample of men

Variables	Domains								
	Agriculture production			Non-farming business activity			Protection from violence		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age	0.003 (0.002)	0.003 (0.002)	0.003 (0.002)	-0.000 (0.002)	0.001 (0.002)	0.000 (0.002)	0.000 (0.002)	0.001 (0.002)	0.000 (0.002)
Household head	0.025 (0.187)	0.012 (0.187)	0.027 (0.189)	0.231 (0.173)	0.163 (0.163)	0.238 (0.178)	0.149 (0.190)	0.078 (0.205)	0.169 (0.191)
No. of hh members	0.034** (0.017)	0.015 (0.018)	0.028 (0.017)	0.057*** (0.017)	0.043*** (0.017)	0.050*** (0.018)	0.032 (0.021)	0.028 (0.019)	0.029 (0.020)
No. of members <6	0.067* (0.036)	0.066* (0.035)	0.067* (0.036)	-0.032 (0.041)	-0.037 (0.043)	-0.025 (0.041)	0.002 (0.048)	0.005 (0.045)	0.005 (0.048)
Years of education	-0.007 (0.006)	-0.007 (0.006)	-0.011* (0.006)	-0.013* (0.007)	-0.010 (0.007)	-0.016** (0.007)	-0.001 (0.007)	-0.000 (0.007)	-0.003 (0.007)
Occupation in agriculture	0.086 (0.206)	0.128 (0.204)	0.116 (0.204)	0.251 (0.218)	0.184 (0.201)	0.299 (0.222)	-0.063 (0.271)	-0.081 (0.272)	-0.078 (0.272)
Sanitation	-0.172*** (0.062)	-0.174*** (0.062)	-0.196*** (0.062)	-0.064 (0.075)	-0.140* (0.075)	-0.090 (0.075)	-0.364*** (0.096)	-0.369*** (0.096)	-0.379*** (0.095)
Cooking fuel	-0.299** (0.141)	-0.304** (0.149)	-0.287** (0.139)	-0.373** (0.171)	-0.322* (0.173)	-0.358** (0.170)	-0.162 (0.181)	-0.177 (0.180)	-0.160 (0.188)
Assets - Access to information	0.137** (0.061)	0.137** (0.062)	0.129** (0.062)	0.089 (0.062)	0.070 (0.064)	0.079 (0.063)	-0.001 (0.065)	0.001 (0.068)	-0.001 (0.065)
Assets - Support of mobility	0.030 (0.050)	0.021 (0.050)	0.019 (0.049)	-0.006 (0.055)	-0.047 (0.053)	-0.011 (0.054)	-0.019 (0.056)	-0.051 (0.057)	-0.025 (0.056)
Assets - Support of livelihood	0.070 (0.055)	0.067 (0.052)	0.066 (0.054)	-0.015 (0.055)	-0.010 (0.053)	-0.037 (0.055)	-0.053 (0.068)	-0.077 (0.067)	-0.064 (0.068)
HH expenditure p.c.	0.110*** (0.021)	0.077*** (0.021)	0.097*** (0.021)	0.096*** (0.023)	0.068*** (0.022)	0.083*** (0.023)	0.162*** (0.027)	0.150*** (0.027)	0.155*** (0.027)
Barisal	-0.412** (0.174)	-0.493*** (0.176)	-0.430*** (0.164)	-0.542*** (0.178)	-0.647*** (0.184)	-0.573*** (0.165)	-0.428** (0.169)	-0.506*** (0.175)	-0.444*** (0.164)
Chittagong	-0.017 (0.169)	0.003 (0.161)	-0.007 (0.168)	0.007 (0.147)	0.016 (0.139)	0.006 (0.147)	-0.090 (0.207)	-0.104 (0.197)	-0.067 (0.207)
Khulna	0.426*** (0.135)	0.372*** (0.141)	0.387*** (0.134)	0.511*** (0.143)	0.426*** (0.144)	0.484*** (0.143)	0.159 (0.135)	0.188 (0.138)	0.156 (0.136)
Rajshahi	-0.507*** (0.156)	-0.275* (0.152)	-0.455*** (0.154)	-0.727*** (0.162)	-0.510*** (0.152)	-0.662*** (0.160)	-1.058*** (0.147)	-0.867*** (0.147)	-1.029*** (0.150)
Rangpur	-0.807*** (0.120)	-0.700*** (0.119)	-0.736*** (0.126)	-0.860*** (0.128)	-0.671*** (0.118)	-0.792*** (0.133)	-1.001*** (0.135)	-0.803*** (0.139)	-0.973*** (0.139)
Sylhet	-0.008 (0.127)	0.047 (0.118)	0.094 (0.124)	-0.143 (0.131)	-0.101 (0.120)	-0.018 (0.135)	-0.689*** (0.192)	-0.476** (0.187)	-0.613*** (0.196)
Feel can make decisions	0.225** (0.091)	0.150 (0.098)	0.206** (0.092)	0.092 (0.090)	0.064 (0.087)	0.079 (0.089)	-0.029 (0.081)	-0.045 (0.080)	-0.033 (0.081)
Satisfaction with decisions		0.351*** (0.040)			0.409*** (0.040)			0.310*** (0.051)	
Power to make decisions			0.081*** (0.015)			0.092*** (0.016)			0.041** (0.021)
F-statistic	9.06***	11.33***	10.00***	6.19***	12.71***	8.30***	11.03***	12.81***	10.74***
No. of observations	2,882	2,876	2,882	2,222	2,215	2,222	1,660	1,643	1,660

Note: The table does not include the estimates of explanatory variables that are not significant in any of the regressions presented, namely: occupation of household head, nutrition and drinking water. *** p<0.01, ** p<0.05, * p<0.1

Table A.12.2: Estimates of Equation (2) using an ordered probit – Sample of women

Variables	Domains								
	Agriculture production			Non-farming business activity			Protection from violence		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age	0.002 (0.003)	0.000 (0.003)	0.001 (0.003)	-0.001 (0.003)	-0.002 (0.003)	-0.001 (0.003)	0.004 (0.004)	0.002 (0.004)	0.003 (0.004)
Household head	-0.022 (0.089)	-0.053 (0.093)	-0.032 (0.091)	0.114 (0.129)	0.089 (0.136)	0.106 (0.133)	0.258*** (0.081)	0.246*** (0.089)	0.251*** (0.083)
No. of household members	0.007 (0.018)	0.007 (0.017)	0.007 (0.018)	0.014 (0.025)	0.008 (0.023)	0.012 (0.025)	-0.005 (0.023)	-0.019 (0.022)	-0.006 (0.024)
No. of members <6	0.073* (0.041)	0.072* (0.041)	0.054 (0.040)	-0.129*** (0.041)	-0.120*** (0.042)	-0.137*** (0.042)	0.087 (0.055)	0.076 (0.058)	0.079 (0.053)
Years of education	0.008 (0.008)	0.004 (0.009)	0.005 (0.008)	0.004 (0.010)	-0.005 (0.011)	0.003 (0.010)	0.026** (0.011)	0.023** (0.012)	0.024** (0.011)
Occupation in agriculture	-0.233*** (0.062)	-0.262*** (0.063)	-0.211*** (0.062)	-0.106 (0.070)	-0.121* (0.069)	-0.099 (0.069)	-0.197** (0.080)	-0.185** (0.081)	-0.199** (0.081)
Sanitation	0.119* (0.061)	0.077 (0.062)	0.105* (0.063)	0.110 (0.079)	0.099 (0.081)	0.101 (0.079)	0.175** (0.088)	0.141 (0.093)	0.171* (0.087)
Cooking fuel	-0.217 (0.135)	-0.157 (0.125)	-0.223 (0.137)	-0.071 (0.193)	0.047 (0.180)	-0.081 (0.191)	-0.305 (0.191)	-0.209 (0.181)	-0.305 (0.193)
Assets - Access to information	0.074 (0.067)	0.028 (0.070)	0.066 (0.066)	0.150* (0.078)	0.147* (0.079)	0.153** (0.077)	0.058 (0.084)	0.028 (0.087)	0.054 (0.085)
Assets - Support of mobility	-0.051 (0.052)	-0.086* (0.051)	-0.041 (0.051)	0.170*** (0.065)	0.102 (0.065)	0.165*** (0.064)	0.132* (0.080)	0.121 (0.079)	0.142* (0.079)
Assets - Support of livelihood	0.048 (0.054)	0.017 (0.054)	0.044 (0.053)	0.003 (0.067)	0.002 (0.069)	-0.012 (0.067)	0.148* (0.079)	0.153* (0.084)	0.139* (0.078)
Household expenditure p.c.	0.006 (0.022)	-0.001 (0.022)	-0.015 (0.023)	-0.005 (0.028)	-0.019 (0.028)	-0.021 (0.029)	-0.053* (0.027)	-0.050* (0.028)	-0.062** (0.028)
Barisal	0.223 (0.293)	0.203 (0.283)	0.260 (0.293)	0.139 (0.301)	0.131 (0.276)	0.182 (0.299)	0.272 (0.243)	-0.003 (0.240)	0.267 (0.240)
Chittagong	-0.389*** (0.126)	-0.474*** (0.134)	-0.376*** (0.126)	-0.451*** (0.174)	-0.515*** (0.186)	-0.435** (0.174)	-0.912*** (0.164)	-1.062*** (0.165)	-0.883*** (0.163)
Khulna	0.348*** (0.123)	0.270** (0.121)	0.349*** (0.118)	0.428*** (0.143)	0.344** (0.143)	0.433*** (0.144)	-0.084 (0.156)	-0.289** (0.131)	-0.094 (0.163)
Rajshahi	-0.229 (0.222)	-0.215 (0.206)	-0.240 (0.210)	-0.446* (0.249)	-0.411* (0.228)	-0.437* (0.245)	-0.461* (0.279)	-0.579** (0.231)	-0.476* (0.270)
Rangpur	-0.420*** (0.123)	-0.405*** (0.127)	-0.430*** (0.123)	-0.675*** (0.149)	-0.612*** (0.146)	-0.670*** (0.149)	-1.189*** (0.139)	-1.095*** (0.157)	-1.204*** (0.142)
Sylhet	-0.281* (0.166)	-0.262* (0.154)	-0.233 (0.162)	-0.529** (0.216)	-0.517** (0.203)	-0.478** (0.216)	0.088 (0.154)	-0.041 (0.145)	0.101 (0.158)
Feel can make decisions	0.105* (0.054)	0.046 (0.053)	0.057 (0.053)	0.111* (0.062)	0.040 (0.065)	0.090 (0.062)	0.023 (0.070)	-0.053 (0.075)	0.012 (0.071)
Satisfaction with decisions		0.372*** (0.038)			0.367*** (0.048)			0.501*** (0.052)	
Power to make decisions			0.079*** (0.015)			0.050*** (0.017)			0.043* (0.022)
F-statistic	4.521***	10.456***	6.647***	7.053***	11.410***	7.095***	7.060***	11.494***	6.522***
No. of observations	2,636	2,562	2,636	1,607	1,509	1,607	1,523	1,417	1,523

Note: The table does not include the estimates of explanatory variables that are not significant in any of the regressions presented, namely, occupation of household head, nutrition, and drinking water. *** p<0.01, ** p<0.05, * p<0.1

Additional References

- Abdi, H. and Valentin, D. (2007). 'Multiple correspondence analysis', In: Salkind N. J. (Ed.), *Encyclopedia of Measurement and Statistics*. Thousand Oaks, CA: Sage Publications; pp. 651–657.
- Mokken, R. J. (1971). *A Theory and Procedure of Scale Analysis*. Berlin: De Gruyter.
- Sijtsma, K., Meijer, R. R., and Van der Ark, L. A. (2011). 'Mokken scale analysis as time goes by: An update for scaling practitioners', *Personality and Individual Differences*, 50, pp. 31–37.