Gender dynamics in intra-household financial decision-making:

An application of Mahalanobis metric matching

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Paper presented at the biennial conference of the Economic Society of South Africa

30 August – 1 September 2017

Grahamstown

Background: Evidence has shown that the empowerment of women with financial and economic resources and with decision-making agency has impacted positively, not only on the wellbeing of women themselves, but so too on the wellbeing of their children. This paper aims to establish how gender dynamics in intra-household financial decision-making by co-resident couples impact on household expenditure on family-type public goods.

Data: South Africa's National Income Dynamics Study (NIDS) collects information on the decision-making responsibility and roles of adult household members, while it also collects information on monthly household expenditure and intra-household relationships within surveyed households, which makes it possible to construct a dataset of co-resident couples.

Method: Mahalanobis metric (MM) matching is employed to estimate the average treatment effect on the treated (ATT) of various gender-specific intra-household decision-making treatments. The outcomes are specific categories of per capita household expenditures and the treated represent co-resident couples comprising household heads and their partners. The quality of matching is assessed using two-sample t-tests, the joint significance and pseudo-R^2 test, and levels of mean standardised bias.

Findings: Women in co-resident couples remain disadvantaged in regards to decision-making power. In the case of sole decision-making responsibility in couples being assigned to women rather than men, per capita household expenditure increases for the following categories of expenditure: food (R151.32, $t=4.79$, $p<0.001$), health care (R128.61, $t=3.15$, $p=0.001$), utilities (R44.98, $t=4.40$, $p<0.001$), insurance (R71.74, $t=4.10$, $p<0.001$), and clothing (R30.24, $t=1.82$, $p=0.069$). When the balance of decision-making power shifts from men to women within joint decision-making couples, per capita household expenditure on education increases (R79.31, $t=2.85$, $p=0.004$). The economic significance of these increases in expenditure is substantial.

Conclusion: The empowerment of women with decision-making responsibility and power holds the promise of impacting positively on household expenditure, thus potentially realising the concomitant benefits of investments in human capital and family-type public goods.

JEL codes: C21, D13, J16

Keywords: intra-household decision-making, matching, household expenditure, South Africa

1. Introduction

Economic development and socio-economic status represent a well-documented pathway to participation and greater autonomy in decision-making (Anderson & Eswaran, 2009; Antman, 2014; Duflo, 2012; Majlesi, 2016). Decision-making agency and autonomy in turn is also an important source of gender empowerment (Kabeer, 1999), which is of significance insofar as Agenda 2030's Sustainable Development Goal (SDG) No.5 strives for gender equality.

Evidence has shown moreover that the empowerment of women with financial and economic resources and with decision-making agency and autonomy has impacted positively, not only on the wellbeing of women themselves, but so too on their children's health and education. The synthesised evidence in the health domain is particularly strong. Pratley (2016), for example, in a systematic review of 67 studies published between 1999 and 2014, concludes that the empowerment of women in the developing world is positively associated with various health outcomes, including antenatal care, skilled attendance at birth, contraceptive use, child mortality, vaccination, nutritional status, and exposure to violence. Thorpe *et al*. (2016) report that ten out of twelve studies found a positive association of full immunisation coverage in children under-five with at least one measure of women's agency. Beyond the health domain evidence is sparse, but school enrolment has been shown to be associated with women's decision-making autonomy in rural Mozambique (Luz & Agadjanian, 2015) and Honduras (Hendrick & Marteleto, 2017). In South Africa, moreover, the provision of grandmothers with old age pensions has been shown to impact positively on the anthropometric status of children, in particular girls (Duflo, 2000/2003). Benevolence, however, is not always evident when empowering women economically: in the same South African setting, children were found to be more likely to attend school when a man rather than a women was eligible for an old age pension (Edmonds, 2006). Felkey (2013) likewise documents how enhancing women's bargaining power may impact negatively on household well-being in terms of expenditure on household public goods.

This paper aims to establish how gender dynamics in intra-household financial decision-making impact on household expenditures on family-type public goods. Section 2 provides a brief theoretical exposition of the collective bargaining model of intra-household decision-making. Sections 3 and 4 presents the data and method. The results and discussion appears in Sections 5 and 6. Section 7 concludes.

2. Theory

The empirical approach taken in this paper, which is described below, draws on three sets of theories. *First*, there is collective models of intra-household decision-making. In the collective model of intra-household decision-making, the assumption of Pareto-efficiency and holding the view that the interaction between spouses determine household utility, allow the couple's utility function to be expressed in accordance with a household utility function expressed as:

$$U_{household} = \mu U_{male\ partner} + (1-\mu) U_{female\ partner} \quad (1)$$

In the function above, μ is the Pareto weight of the male partner and U is the utility function (Browning et al., 2014). The household utility function ($U_{household}$), therefore, is the weighted sum of the partners' utility functions. It is plausible to argue that where the couple is the integral part of the household unit, the household utility function can be represented by the sum of the utilities of both partners in the couple. The household utility function considers the power of one partner, relative to the other. Conditional on any fixed cardinalisation of $U_{male\ partner}$ and $U_{female\ partner}$ (Lührmann & Maurer, 2008), the size of μ determines the level of influence that the male partner has on the household's utility function. At values of μ closer to one (zero), the male partner's (female partner's) voice or influence is dominant in determining household decisions. His (her) preferences are better represented in the household's utility function. The utility function, therefore, is weighted by relative decision-making power (Felkey, 2013).

Cooperative bargaining models, a class of collective models that takes into consideration so-called distributional factors (Bertocchi et al., 2014; Browning et al., 2014), describes the Pareto weight as a function of four components:

$$\mu = \mu (p , y , x , z) \quad (2)$$

, where p = prices, y = household income, x = individual characteristics, and z = distributional factors (Lührmann & Maurer, 2008; Bertocchi *et al.*, 2014; Browning *et al.*, 2014). Depending on the resources that each partner contributes to the household, μ tilts in the main contributing partner's favour with regard to decision-making within the household. These resources constitute distributional factors, which include relative ages, relative education, individual incomes, social norms, traditional roles, and institutional variables affecting the cost of marriage breakdown (Maitra & Ray, 2006; Lührmann & Maurer, 2008; Bourguignon, Browning & Chiappori, 2009; Bertocchi *et al.*, 2014; Browning *et al.*, 2014).

Secondly, there is the theory of assortative mating in the marriage market. Positive assortative mating on sources of economic bargaining power is associated with homogamy in couples. More specifically, equilibrium in the marriage market is achieved where there is positive assortative mating on wages and wealth, i.e. spouses and their partners have similar wages or wealth (Lam, 1988). Greater homogamy theoretically is associated with greater equality in decision-making. However, there could be heterogamy in couples if positive assortative mating is less pronounced, resulting in partner differentials in sources of bargaining power. Such heterogamy in couples raises the Pareto weight of a single partner who is better endowed with resources. Consequently, household outcomes may be tilted in favour of the preferences of the partner contributing relatively more resources.

Finally, the resource theory of power developed by sociologists also suggests that the power of each partner is related to his/her relative resources (Wolfe, 1959; Blood & Wolfe, 1960; Cantillon, Maître & Watson, 2016).

3. Data

The baseline National Income Dynamics Study (NIDS) collected information on the decision-making responsibility and roles of adult household members from a nationally representative sample of households, while it also collected information on monthly household expenditure and on intra-household relationships within surveyed households.

The couple-level data employed in this study was constructed as follows: on the household roster, it was recorded whether the specific adult is married to or lives with their partner. If so, the spouse's or partner's person code was recorded, but only if the person's name appeared on the household roster.[1] In this way, female spouses or partners were linked to their male counterparts, with each observation in the data representing one of a total of 1,995 couples. For each couple, the individual-level characteristics are represented by two sets of variables, one for female and one for male spouses and partners. As no information was available on decision-making for non-resident household members, the sub-sample is restricted to co-resident

[1] In the survey, household members are defined as follows: (i) you have lived under this "roof" or within the same compound/homestead/stand at least 15 days during the last 12 months OR you arrived here in the last 15 days and this is now your usual residence AND (ii) when you are together you share food from a common source with other household members AND (iii) you contribute to or share in a common resource pool.

couples. Furthermore, to ensure a more direct methodological link with household expenditure, the analysis was restricted to couples including resident household heads, given that the expenditure module of the survey was completed by household heads, which restricted the analytical sample for the expenditure analysis to a sub-sample of 1,906 couples. Per capita household expenditure for a specific category of goods or services was calculated by dividing monthly expenditure by total household size.

The survey asks the following question in regards to financial decision-making: "Who makes decisions about day-to-day household expenditures?"[2] Responses are recorded as, "main decision-maker" or "if joint, who is the second decision maker". In each case, the relevant person's personal identifier (pcode) is recorded on the questionnaire. Based on this information, two categorical variables were constructed. The first outcome draws a distinction between decision-makers and non-decision-makers ('decision-making responsibility'). The second outcome, 'decision-making-power', classifies decision-makers as joint or main decision-makers. Decision-making responsibility and power is based on both self-identification (i.e. identifying yourself as joint or main decision-maker) and the responses of other adult household members (i.e. others identifying the relevant person as a joint or main decision-maker).[3] The decision-making variables for each spouse or partner were linked to the couple-level data using a unique identifier for each couple.

[2] The survey also asks four other questions on decision-making, each relating to a different sphere. The questions are as follows: "Who makes decisions about large, unusual purchases such as appliances, vehicles or furniture?"; "Who makes decisions about where your children should go to school?"; "Who makes decisions about who is allowed to live in the household as part of the household?"; "Who makes decisions about where the household should live?". As the focus here is on monthly household expenditure *per se*, the analysis employs only the one question on day-to-day expenditure.

[3] For the purpose of the analysis conducted in this paper, individuals were assigned their "highest" recorded level of decision-making power. In other words, if the respondent identified him/herself as "main" decision-maker, or any other household member identified the person as "main" decision-maker, the individual was assigned the status of "main" decision-maker. Next, respondents were assigned the status of "joint" decision-maker if they themselves or any other household member accorded them the role of "additional" decision-maker. Non-decision-makers are those respondents who did not identify themselves as decision-makers and was not identified as decision-makers by any other household member. For this reason, couples may include two main or two joint decision-makers. In other words, as multiple household members assigned themselves and others' decision-making roles, there is room for disagreement as to assigned decision-making roles. A simpler approach was opted for here rather than focusing on explaining the nature of these disagreements or focusing only on those cases where there was complete agreement in the assignment of decision-making roles. It is proposed that these data be employed to conduct a much richer and nuanced analysis of decision-making as part of further research.

4. Method

Where studies lack randomisation, matching methods are used to estimate treatment effects using observational data (Baser, 2006). Given the small number of covariates, i.e. less than eight (Stuart, 2010), standard Mahalanobis metric (MM) matching, an example of a covariate matching (CVM) method (Caliendo & Kopeinig, 2008), here is preferred over exact matching (Stuart, 2010) or more conventional propensity score matching (PSM) (Baser, 2006; Caliendo & Kopeinig, 2008; D'Agostino, 1998). PSM generally is more efficient in cases where there are many, highly multi-dimensional and normally distributed covariates (Stuart, 2010).[4] MM matching works as follows: first, subjects are ordered randomly. Next, the distance between the first treated subject and all the control is calculated. Distance, in this case, is defined as follows:

$$d(i,j) = (u - \upsilon)^{T} C^{-1} (u - \upsilon) \quad (3)$$

, where u and υ are the respective values for the matching variables for treated subject i and control subject j. C is the sample covariance matrix of the matching variables for all control subjects. Control subject j closest to the treated subject i, i.e. where d is at its minimum, is then assigned as the match. Then, both subjects are removed from the pool of observations. This process is repeated until a match is found for each treated case (D'Agostino, 1998).

The matching estimator includes five covariates. Four relate to so-called 'couple differentials', while the other is a household characteristic, namely the dependency ratio. The differentials include differences between spouses and partners in age, years of education, employment status, and income. The employment status variable draws a distinction between spouses and partners both being unemployed [=1], the husband only working [=2], the wife only working [=3], and spouses and partners both being employed [=4]. This approach, i.e. the use of relative differences within couples, is informed by resource theory and the principle of heterogamy central to cooperative bargaining models of intra-household decision-making (Section 2).

Three methods are employed to assess the quality of matching. *First*, two-sample t-tests are employed to determine if each individual covariate differs statistically significantly between the treatment and control groups pre- and post-matching. Balance requires that there are no

[4] Mahalanobis matching (MM) is also combined with propensity score matching methods, such as nearest-neighbour and caliper, kernel and radius matching (Baser, 2006; D'Agostino, 1998).

statistically significant differences. *Secondly*, a likelihood ratio (LR) test is used to determine if the set of covariates still explain any difference in the new treatment-control assignment as opposed to the original treated-untreated assignment. The matching estimator meets the quality criterion when the post-matching pseudo-R^2 is very low and the LR-test returns a statistically insignificant value, as opposed to a meaningful pseudo-R^2 and significant LR-test. The *third* yardstick is mean standardised bias (SB), i.e. the difference in the sample means in the sub-samples of treated and matched subjects as a percentage of the square root of the average sample variances in the two groups, which generally should fall in or below the 3-5% range (Caliendo & Kopeinig, 2008). Mahalanobis metric (MM) matching is implemented using Stata's *psmatch2* (Leuven & Sianesi, 2003).

The analysis focuses on estimating the average treatment effect on the treated (ATT) for two treatments, constructed based on a comparison between spouses' and their partners' decision-making responsibility (Figure 1a) and decision-making power (Figure 1b). The first is a comparison between couples in which the wife is the sole decision-maker and the husband reportedly has no decision-making responsibility ('treatment 1' – 'B' in Figure 1a) as opposed to couples in which the husband is the sole decision-maker and the wife reportedly has no decision-making responsibility ('control' – 'C' in Figure 1a). The second comparison draws a distinction between joint decision-making couples in which the wife and husband are the main and joint decision-makers, respectively ('treatment 2' – 'F' in Figure 1b) and couples in which these roles are reversed ('control' – 'H' in Figure 1b). Whereas the numbers of observations in each of the treatment and control groups are relatively balanced for 'treatment 1' (186 *versus* 171), the numbers for 'treatment 2' are not, with many more cases in the control than in the treatment group (882 *versus* 346).

[Figures 1a and 1b about here]

The outcome measures are specific categories of per capita household expenditures. More specifically, the focus is on "family-type" public goods. Typical of such categories include water, heat and electricity (utilities); furniture (household items), and car-related and transport expenses (transport) (Couprie, Peluso & Trannoy, 2010). In addition, food (Gan & Vernon, 2003) and expenses on household members' education, health, insurance and clothing (Suen, Chan & Zhang, 2003), all constitute family-type family public goods. Mok, Maclean and Dalziel (2011) consider family public goods as goods that can be shared within the family while

Felkey (2013) classified household public goods as those that give utility to all household members. In this context, eight expenditure categories are analysed i.e. food, education, healthcare, utilities, insurance, transport, clothing, and household items.

5. Results

According to Table 1, the vast majority of partners and spouses, in excess of 90%, play some decision-making role. The difference, moreover, between wives and husbands is not statistically significant ($p=0.405$). However, there is a stark and highly statistically significant difference in the distribution of decision-making power between spouses and partners ($p<0.001$). Wives generally are joint decision-makers, whereas husbands for the most part take on the main decision-making role.

[Table 1 about here]

Table 2 reports mean per capita household expenditure for each of eight categories for the complete sample of couples. As expected, expenditure is highest for food (R288), followed by transport (R169). For the remaining categories, expenditure is relatively similar, ranging from approximately R60 to R80, except for clothing, which is lowest, at R32.

[Table 2 about here]

Table 3 compares per capita expenditure between the treatment and control groups for 'treatment 1'. With the exception of transport, expenditure is always higher where the wife is the sole decision-maker, in some cases by a substantial margin. The absolute difference in expenditure levels is around a R100 or more for food (+R98) and healthcare (+R111). In five instances, the reported difference is statistically significant ($p<0.05$): food, healthcare, utilities, insurance, and clothing. There is evidence, therefore, based on descriptive statistics alone, that per capita household expenditure is higher where wives are the sole decision-maker. The question, however, is whether these differences remain statistically and economically significant when a more rigorous empirical strategy is employed to answer the research question, in this case matching on covariates.

[Table 3 about here]

In terms of the quality of the Mahalanobis matching (Table 4), the analysis performs adequately on all three criteria, i.e. two-sample t-tests, joint significance and pseudo-R^2, and mean standardised bias, although mean standardised bias at around 4% falls just within the prescribed band of 3-5%. The LR-test is not rejected in each and every case, while the t-tests all turn statistically insignificant.

[Table 4 about here]

In four out of the five cases reported as statistically significant in Table 3, the average treatment effect on the treated (ATT) is still positive and highly statistically significant ($p<0.01$) (Table 4). Clothing, however, now achieves only weak statistical significance ($p<0.10$). In all cases, these increases in per capita household expenditure in relative terms is economically significant too. The marginal treatment effect as a percentage of mean per capita household expenditure in the entire sample of co-resident couples is as follows (i.e. comparing the figures in Table 4 versus Table 2): food (52.4%), utilities (57.6%), clothing (91.9%), insurance (114.7%), and healthcare (158.2%). The increases are even more striking when comparing the ATT treatment effect to the mean expenditure in the control group as estimated by the matching method, i.e. the value for the non-treatment group. Compared to couples where the husband is the sole decision-maker, couples where wives are the sole decision-maker spend 88.4% more on food (R151.32 versus R171.21) and almost twice as much on utilities (104.0%) (R44.98 versus R43.26). For the other expenditure categories, the increases can be expressed in manifolds: expenditure on clothing increased two-fold (R30.24 versus R14.35), four-fold for insurance (R71.74 versus R16.32), and on healthcare seven-fold (R128.61 versus R16.62).

[Table 5 about here]

Table 5 follows the same approach as Table 3, but reports the comparisons for ‘treatment 2’. In all but one case, the difference is positive. In other words, couples where wives are main and husbands are joint decision-makers spend more in per capita terms than couples where husbands are main and wives are joint decision-makers. For household items the opposite is true, i.e. couples where husbands are main and wives are joint decision-makers spend more in per capita terms than couples where wives are main and husbands are joint decision-makers. There are four statistically significant differences, two of which are only weakly significant ($p<0.10$), i.e. utilities and household items. The differences in expenditure on education and personal items are highly significant ($p<0.01$), whereas healthcare is significant at the 5% level.

For household items (-R52) and education (+R58) the differences are relatively large in absolute terms. For the other categories of expenditure, the absolute differences are as follows: transport (+R2), clothing (+R8), utilities (+R15), insurance (+R18), food (+R24), and healthcare (+R35).

[Table 6 about here]

In contrast to the comparisons in Table 5, which are descriptive in nature, Table 6 reports the findings from the Mahalanobis metric matching. Most important, however, is that these results in terms of treatment effects change markedly when subjected to a more rigorous test for causal inference, namely metric matching. There are three negative treatment effects (greater expenditure under male control) and five positive treatment effects (greater expenditure under female control). Now, only a single treatment effect on the treated (ATT) is statistically significant, but highly so ($p=0.004$). The treatment effect is also substantive in economic terms, being 133.5% greater than mean per capita expenditure on education by co-resident couples (R79.31 versus R59.41) (Table 6 versus Table 2) and four times as high as per capita expenditure on education by couples where the male spouse or partner is the main decision-maker and the female spouse or partner the joint decision-maker (R79.31 versus R19.95). When it comes to matching quality, the latter analysis performs exceptionally well on all three criteria. In terms of the two-sample t-tests, the post-match differences are statistically insignificant for all the five covariates. Mean standardised bias, at around 2%, falls well below the prescribed band of 3-5%. The LR-test results point to a failure to reject the null hypothesis, i.e. that the covariates together does not explain any variation in the post-matching treatment assignment.

6. Discussion

Whereas most spouses and partners have some say in decision-making on day-to-day household finances, there is substantial disparity in decision-making power between wives and their husbands. There remains scope therefore for the implementation and scale-up of programmes fostering the empowerment of women, particularly in the economic and social domains. An example includes economic self-health groups (SHGs). Evidence from research

synthesis suggests that economic SHGs impacts positively on women's empowerment, both at the economic, social and political levels. More specifically, independence in financial decision-making moreover is highlighted as a key factor channelling the positive impact of SHGs on women's empowerment (Brody et al., 2015). Vaessen et al. (2014), however, in their quantitative synthesis of evidence on the extent to which microcredit affects women's control over household spending in developing countries, found no positive effects of statistical significance. In their qualitative synthesis the authors nevertheless highlight the extent to which decision-making power acts as a situational mechanism determining whether or not microcredit translates into control over household resources (Vaessen et al., 2014).

The treatment effect of women's decision-making responsibility on expenditure on family-type public goods (food, utilities, insurance, healthcare) is significant, both in statistical and in economic terms. The same is true for women's decision-making power in joint decision-making couples, but in this case only for expenditure on education. There are tangible benefits, therefore, in enhancing women's decision-making responsibility and power.

The study has various limitations. (*a*) Couples for whom the residency requirements (see footnote 1) does not apply are excluded from the analysis, which means that decision-making by non-resident couples cannot be investigated with the aid of this survey, thus calling for further research of either a qualitative or quantitative nature. (*b*) It is not possible to determine if the recorded increases in per capita household expenditure actually translate into downstream benefits, e.g. whether increased expenditure on education improves school attendance and performance, or whether healthcare expenditure enhances health outcomes for children and other household members. Food expenses, moreover, may not necessarily translate into purchases of diverse and nutritious foodstuffs that enhances micronutrient intake and dietary diversity. (*c*) There may also be inequalities in the distribution between household members of increases in household expenditure, with not all household members benefitting equally. Insurance, for example, may cover only some household members, whereas increases in food expenditure may benefit some household members more than others. Such inequality, however, may be pro-development whether it favours children, particularly where expenditure on food, healthcare and education is concerned. (*d*) Given its focus on household expenditure, this study focuses only on financial decision-making. Women in reality however may be empowered economically, but still lack participation and autonomy in other decision-making domains such

as the sexual, social and political spheres. (*e*) In addition, the survey approach precludes a more in-depth and nuanced analysis of how gender dynamics in decision-making on household expenditure play out in families, thus warranting further qualitative research in this field.

7. Conclusion

The empowerment of women with decision-making responsibility and power holds the promise of impacting positively on household expenditure, thus potentially realising the concomitant benefits of investments in human capital and family-type public goods. Yet, women remain at a disadvantage in relation to decision-making power in matters of household finances. For this reason, concerted efforts are required in achieving Sustainable Development Goal No.5 of achieving gender equality.

8. References

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Figure 1a: Treatment and comparison group – decision-making status

		Husband's decision-making status	
		No	Yes
Wife's decision-making status	No	A [0]	C [171]
	Yes	B [186]	D [1,638]

Note: Sample size in brackets. "B" treatment group; "C" comparison group.

Figure 1b: Treatment and comparison group – decision-making power

		Husband's decision-making power		
		None	Joint	Main
Wife's decision-making power	None	A [0]	D [25]	G [146]
	Joint	B [6]	E [1]	H [882]
	Main	C [180]	F [346]	I [409]

Note: Sample size in brackets. "F" treatment group; "H" comparison group.

Table 1: Decision-making responsibility and power, by gender

	Wife	**Husband**	**Total**
Decision-making responsibility:			
No	8.6	9.3	9.0
Yes	91.4	90.7	91.0
Total	*100.0*	*100.0*	*100.0*
Sample (n)	*1,995*	*1,995*	*3,990*
Decision-making power:			
Joint	48.7	20.6	34.7
Main	51.3	79.4	65.3
Total	*100.0*	*100.0*	*100.0*
Sample (n)	*1,824*	*1,809*	*3,633*

Table 2: Household expenditure by co-resident couples

Expenditure category	**Mean per capita household expenditure (Rand)**	**Sample (n)**
Food	288.66 (6.76)	1,995
Education	59.41 (8.11)	1,987
Healthcare	81.31 (8.77)	1,990
Utilities	78.08 (3.34)	1,989
Insurance	62.54 (5.18)	1,979
Transport	169.78 (12.83)	1,995
Clothing	32.90 (2.66)	1,984
Household items	68.43 (12.21)	1,988

Note: Standard errors are reported in parentheses.

Table 3: Per capita household expenditure by co-resident couples, by decision-making status

Expenditure category	Wife is sole decision maker	Husband is sole decision maker	p-value	Sample (n)
Food	313.86 (24.37)	215.32 (15.84)	< 0.001	374
Education	77.74 (45.81)	20.10 (5.71)	0.129	373
Healthcare	136.68 (53.26)	25.57 (6.88)	0.031	372
Utilities	86.02 (12.02)	50.33 (7.36)	0.008	371
Insurance	84.69 (16.86)	30.76 (13.51)	0.008	372
Transport	143.86 (27.87)	171.06 (83.10)	0.632	374
Clothing	46.11 (9.99)	12.13 (3.63)	0.001	370
Household items	68.28 (29.55)	33.38 (9.66)	0.153	372

Note: Standard errors are reported in parentheses.

Table 4: Average treatment effect on the treated (ATT) for decision-making status and per capita household expenditure

Expenditure category	ATT (SE)	t-test (p-value)	Sample (n)	Covariate t-tests	Mean bias (%)	LR test (p-value)
Food	151.32 (31.60)	4.79 (<0.001)	333	√	4.1	4.52 (0.718)
Education	61.77 (63.03)	0.98 (0.327)	332	√	4.1	4.59 (0.710)
Healthcare	128.61 (40.85)	3.15 (0.001)	332	√	4.2	4.61 (0.708)
Utilities	44.98 (10.22)	4.40 (<0.001)	331	√	4.2	3.42 (0.844)
Insurance	71.74 (17.49)	4.10 (<0.001)	332	√	4.1	4.52 (0.718)
Transport	62.49 (49.84)	1.25 (0.212)	333	√	4.1	4.52 (0.718)
Clothing	30.24 (16.61)	1.82 (0.069)	331	√	4.2	4.61 (0.708)
Household items	27.00 (52.12)	0.52 (0.603)	332	√	4.1	4.52 (0.718)

Note: Standard errors for ATT are reported in parentheses. Standard errors are heteroscedasticity-consistent (Abadie & Imbens, 2006).

Table 5: Per capita household expenditure by co-resident couples, by decision-making power

Expenditure category	**Wife is main decision maker and husband is joint decision maker**	**Husband is main decision maker and wife is joint decision maker**	**p-value**	**Sample (n)**
Food	304.91 (19.21)	280.18 (9.57)	0.102	1,228
Education	100.03 (31.57)	41.92 (6.08)	0.004	1,224
Healthcare	100.91 (18.46)	65.82 (8.98)	0.028	1,226
Utilities	90.63 (8.86)	75.23 (5.08)	0.059	1,226
Insurance	74.16 (13.66)	56.05 (7.84)	0.116	1,219
Transport	163.97 (27.33)	161.63 (16.25)	0.470	1,228
Clothing	37.47 (5.25)	29.25 (3.66)	0.110	1,225
Household items	33.86 (7.63)	85.99 (24.74)	0.095	1,224

Note: Standard errors are reported in parentheses.

Table 6: Average treatment effect on the treated (ATT) for decision-making power and per capita household expenditure

Expenditure category	ATT (SE)	t-test (p-value)	Sample (n)	Covariate t-tests	Mean bias (%)	LR test (p-value)
Food	5.43 (23.73)	0.23 (0.818)	1,169	√	2.1	2.15 (0.951)
Education	79.31 (27.80)	2.85 (0.004)	1,166	√	2.0	2.09 (0.954)
Healthcare	21.29 (27.02)	0.79 (0.429)	1,168	√	2.1	2.09 (0.955)
Utilities	11.77 (14.94)	0.79 (0.429)	1,168	√	2.1	2.11 (0.954)
Insurance	-12.08 (17.73)	0.68 (0.496)	1,161	√	2.1	2.15 (0.951)
Transport	-7.60 (38.36)	0.20 (0.841)	1,169	√	2.1	2.15 (0.951)
Clothing	5.13 (8.58)	0.60 (0.548)	1,167	√	2.1	2.10 (0.954)
Household items	-59.70 (45.62)	1.31 (0.190)	1,166	√	2.0	2.05 (0.957)

Note: Standard errors for ATT are reported in parentheses. Standard errors are heteroscedasticity-consistent (Abadie & Imbens, 2006).