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Husbands' and wives' diverging perceptions on who decides*

Abstract

An emerging literature highlights the importance of empowering women. Female decision-making power is typically measured by surveying only one partner, but the few studies surveying both have documented large differences in perceptions. We analyze these perceptions and their consequences, using survey data from Indonesia. Both male and female respondents systematically report a higher share of decision domains in which they decide. Female labor supply and contraception use are higher when both partners perceive female decision-making power in these domains. Increases in female income share are associated with increases in the perceived female decision-making power.

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Keywords: Female decision-making power; intrahousehold allocation; family planning; female labor supply; discordance in household surveys

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1. Introduction

There is great academic and public interest in understanding the causes and consequences of female decision-making power in households. This interest is driven by both concerns about female empowerment and the notion that shifts in bargaining power from men to women are associated with *desirable* changes in household behavior.[1] However, as *true* power remains unobserved, studies rely on proxies. Surveys are widely considered to be the most unequivocal proxy for female decision-making power (Majlesi, 2016; Malhotra, Schuler, and Boender, 2002). Accordingly, a growing number of publications in economics and related fields relies on decision-making surveys.[2] Surprisingly, the vast majority of scholars does not account for the possibility of divergent spousal responses. This is striking as power is rarely exerted in a social vacuum. Studies that consider both spouses' perspectives find high rates of discordance about female decision-making power (We will refer to divergent spousal responses as discordant statements. Matching spousal responses will be referred to as concordant).

This paper explores spousal discordance in statements on female decision-making power. We contribute to existing literature in three ways. First, we confirm that discordance is a phenomenon that is common and *non-random*: specific types of discordance are systematically related to female power proxies such as the female share in the household's income. Additionally, we show that prediction of outcomes can be improved if both spouses' perspectives are taken into account. This study is the first to provide a detailed account of the relationship between specific types of discordance and females' labor market outcomes. Thirdly, we evaluate the elasticity of male and female perception of female decision-making power if relative female economic resources change. We show that spouses' changes in their perceptions are not statistically significantly different from each other. This is the first study to use an exogenous income shock to address concerns of potential endogeneity.

Our contribution to existing literature is thereby both empirical and methodological. Only a few previous studies consider both spouses' responses. They find discordance to occur frequently and in a non-random manner. Even fewer studies associate specific types of discordant statements with outcomes. So far only a limited number of outcomes has been related to discordant statements (Ambler et al., 2017; Becker,

1. For example, Duflo and Udry (2004) exploit variation in crop yield to show that increases in relative female income cause increased food and educational expenditure.

2. For a review see Donald et al. (2017). For examples see Anderson and Eswaran (2009), Bruins (2017), Jensen and Oster (2009), and Majlesi (2016).

Fonseca-Becker, and Schenck-Yglesias, 2006; Jejeebhoy, 2002).[3] This study benefits from an uncommon breadth and depth of information on households, reaching from household decision-making to labor outcomes and contraceptive use. It is based on data from the Indonesian Family Life Survey (IFLS), a panel survey administered to Indonesian households since 1993. A particular merit of the IFLS is a household decision-making module that provides both partners' perceptions of who makes decisions across 13 different household domains, for instance, on children's health or saving decisions.

In our first analysis, we survey whether discordance can be considered *random* or whether it is related to couple attributes. On average, the share of discordant, non-matching responses varies from 33 to 51 percent across decision domains. We find the prevalence of specific types of discordance to vary with female income share and other proxies for female power. Findings suggest, that discordance is not *random*, but systematically related to *real* power.

Secondly, we relate discordance to two proxies for female power, female labor force participation and contraceptive use. We find that female labor supply and rates of contraceptive use are higher when both partners perceive female power, relative to cases of strong discordance about the female role and relative to concordant reports on the husband as the sole decision maker. We also find that predictions of these outcomes can be improved by taking both spouses' perceptions of female power into consideration. This is based on additional analysis, in which we hold the wife's perception constant and observe outcomes for all possible responses by the husband.

Thirdly, we explore the association of variation in female economic resources and the perception of female decision-making power from both spouses' perspectives. This allows us to predict the potential bias in studies that evaluate the impact of economic interventions on female empowerment and that use one-sided surveys to do so. First, we run a fixed effects model without exogenous variation of income. In the second model, we use a cross-section setting with an exogenous variation of spousal income shares. In both models, we associate changes in relative female economic resources with the male and female perception of female decision-making power. We find that both spouses' changes in perception are in the same order of magnitude. This sug-

3. Becker, Fonseca-Becker, and Schenck-Yglesias (2006) and Jejeebhoy (2002) study health outcomes while Ambler et al. (2017) proxy female well-being across multiple dimensions, including labor supply. Compared to this paper, this account of labor supply is less detailed and is limited to a binary variable, indicating whether the wife works more or less than 10.5 hours per day.

gests that one-sided surveys will provide a good proxy if one is interested in the average adaptation of perception following an economic shock.

In summary, results suggest that at the population level, one-sided surveys provide a good proxy for shifts in male and female perception of female decision-making power in reaction to a change in female economic resources. However, cross-section estimates suggest that females' outcomes will differ in those families where both spouses' reactions correlate vs. those where only one spouse changes its perception of female power. We conclude that in the context of households, both spouses' perspectives should be taken into account.

The remainder of this paper is structured as follows. In section 2, we present an overview of empirical studies that employ one- and two-sided surveys to proxy decision-making power. Our focus will be on studies that explicitly describe discordance in response patterns between husbands and their wives. In section 3, we will describe the data. In section 4, we will introduce the typology we use to classify spousal statement combinations and prevalence rates of specific types. Then, we will present our main results. In section 5, we will survey couple attributes which are associated with different types of con- and discordance. In section 6, we will study outcomes of different types of concordant and discordant couples. A particular focus will be on the merit of considering both spouses' perspectives. In section 7, we will assess the relationship between variations in female economic and decision-making power. In section 8, we will run different robustness checks. We will conclude in section 9 by discussing the implications and limitations of our findings.

2. Discordance in previous literature

The following account of the previous literature is divided into three subsections. In subsection 2.1, we will motivate this study by documenting the wide use of decision-making surveys in economics and related literature. In subsection 2.2, we will present previous evidence on discordance in such surveys. In the final subsection 2.3, we will discuss potential moderators of discordance.

2.1. Measuring female decision-making power

This study is concerned with female decision-making power in the household. Following Kabeer (1999), we understand female decision-making power as one dimension of female agency and female agency as one dimension of female empowerment.[4] Our study thereby relates to the wider empowerment literature (see Duflo (2012) for a review) and the agency literature in specific (see Donald et al. (2017) for a review). There is great academic and public interest in understanding the causes and consequences of female decision-making power in households. This interest is driven by both concerns about female empowerment and the notion that shifts in bargaining power from men to women are associated with *desirable* changes in household behavior (Bruins, 2017; Duflo and Udry, 2004; Jensen, 2012; Lundberg, Pollak, and Wales, 1997; Majlesi, 2016; Bandiera et al., 2018).[5]

Due to the high interest in female empowerment, many scholars are concerned with how to best measure it. Majlesi (2016) posits that *asking* household members about their decision-making power is the most unequivocal way to capture it. Accordingly, many empirical studies rely on surveys to determine decision-making power in the household – in economics (Anderson and Eswaran, 2009; Banerjee et al., 2015; Bruins, 2017; Jensen and Oster, 2009; Majlesi, 2016) as well as in related disciplines such as demography and sociology (Ebot, 2014; Hayes and Boyd, 2017; Kabeer, Mahmud, and Tasneem, 2011; Mboane and Bhatta, 2015; Rahman and Rao, 2004). Malhotra,

4. Kabeer (1999) defines empowerment as command over resources, agency, and achievements. See Malhotra and Schuler (2005) and Malhotra, Schuler, and Boender (2002) for a discussion of female empowerment concepts in international development.

5. For example, Majlesi (2016) documents a positive association between female labor market conditions, female decision-making power, and child health. Duflo and Udry (2004) use gender-specific specialization in crops and weather-induced variation of crop-specific income. Holding total family income constant, higher yields for *female* crops cause higher relative spending on food. Along the same lines, Wang (2014) finds a reduced consumption of *male favored goods* such as cigarettes following a re-allocation of property rights in China. For Bangladesh, Heath (2014) finds that women report being more confident to assert their own decision-making power towards their husbands if they earn a salary.

Schuler, and Boender (2002, p. 26) show that decision-making indicators are some of the "most frequently used indicators" in literature to measure empowerment. Donald et al. (2017) second this view based on their comprehensive account of studies employing household decision-making surveys. The authors confirm the (wide and increasing) use of surveys in literature and discuss their methodological shortcomings. Furthermore, surveys on female decision-making power are now part of the widely used Demographic and Health Surveys (DHS). This will likely encourage frequent use of decision-making surveys in the future (Donald et al., 2017).

2.2. Discordance of spousal statements

Despite the popularity of intra-household decision-making questionnaires, studies employing data from both partners challenge the notion that survey data from only one household member is sufficient to describe power dynamics within the household. Studies that do consider both males' and females' perspectives report substantial and systematic differences in power assessments made by men and women respectively (Allendorf, 2007; Ambler et al., 2017; Granbois and Willett, 1970; Story and Burgard, 2012; Twyman, Useche, and Deere, 2015; Uddin, Habibullah, and Sabah, 2016). The subset of studies that focuses on discordance observes variation in discordance between different groups and decision domains (Becker, Fonseca-Becker, and Schenck-Yglesias, 2006; Ghuman, Lee, and Smith, 2006; Jejeebhoy, 2002; Quarm, 2018; Lupri and Brinkerhoff, 1978; Twyman, Useche, and Deere, 2015). However, only a few previous studies link discordant statements to outcomes.

The study with the highest relevance to this one is that of Ambler et al. (2017). Ambler et al. (2017) link discordance to female well-being using data from Bangladesh.[6] Compared to couples in which both partners agree on the husband as the sole owner of the family's assets and primary decision maker, outcomes for women are better if the couple agrees on joint asset ownership and decision-making. Compared to the baseline scenario, female outcomes are also better in discordant couples in which the wife posits female asset ownership and decision-making power with her husband disagreeing.

A small number of previous studies has documented the relationship between discordant reports and health outcomes (Allendorf, 2007; Becker, Fonseca-Becker, and Schenck-Yglesias, 2006; Gasca and Becker, 2017; Jejeebhoy, 2002). Becker, Fonseca-

6. Female well-being is proxied by various measures such as working hours, BMI and use of birth control.

Becker, and Schenck-Yglesias (2006) document female under-reporting of their own decision-making power relative to their husbands as well as a (weak) association of female decision-making power and health behavior in Western Guatemala. Becker, Fonseca-Becker, and Schenck-Yglesias (2006) confirm a positive relationship between female education and concordant statements on joint decision-making. The authors find variation as to whether the male or the female's opinion on female autonomy was the better predictor of preventive health-related behaviors, such as the use of the contraceptive pill. They conclude that studies should elicit both husbands' and wives' perspectives on decision-making power. In Uttar Pradesh, a region characterized by low gender-equity, Jejeebhoy (2002) find men's perspective on female autonomy to be more predictive of outcomes than women's. In contrast, in Tamil Nadu, a region with higher reported female autonomy, women's perspectives are more indicative of contraception-related health outcomes.[7] Allendorf (2007) finds high rates of discordant responses in Nepal. The author finds higher rates of health care utilization in couples that give a concordant report on female decision-making power, compared to couples in which only one partner perceives female decision-making power, while the other does not.

2.3. Moderators of discordance

Discordance might arise from multiple causes, a selection of which will be discussed in the following. Moffitt et al. (1997) argue that measurement error will induce statement discordance that might be falsely interpreted as a reflection of disagreement. The authors posit that aggregating responses across questions can reduce this error. Specifically, Safilios-Rothschild (1970) warns that broad and unspecific decision domain might lead to gender differences in understanding of the matter. Ghuman, Lee, and Smith (2006, p. 3) show for five Asian countries that "cognitive and/or semantic meanings" of questions vary between demographic and cultural contexts and between female and male respondents, thereby limiting the generalizability of such comparisons.[8] Anderson, Reynolds, and Gugerty (2017) find higher rates of concordance in couples in Tanzania with higher educated women.

Discordance can also be caused by respondent's intention to paint a socially desirable picture (Allendorf, 2007; Jejeebhoy, 2002). For example, Jejeebhoy (2002) finds that

7. The authors consider the following outcomes: contraceptive use, unfulfilled need for contraception, recent pregnancy, and spousal conversation about contraception.

8. The five countries are India, Pakistan, Philippines, Malaysia, and Thailand.

husbands attribute more power to their wives than wives attribute to themselves in rural India. Accordingly, discordance is particularly high in regions with greater gender inequality. However, if questioned in depth during focus group interviews, men tend to correct previous statements and provide socially less desirable answers. Norms might also provide a focal point to the potentially ambiguous question of power. Allendorf (2007) finds that concordance is higher whenever there are clear gender norms on responsibility.

Surveys on interpersonal violence (IPV) face similar methodological challenges. Moffitt et al. (1997) suggest that social desirability, salience, and self-justification might moderate over- and under-reporting of IPV, among other things. Hayes and Boyd (2017) observe that the husband's presence during the wife's interview led to a reduced stated female acceptance of IPV. Conversely, the presence of another female induced higher stated acceptance of IPV.

2.4. Cultural context: female power in Indonesia

Discordance needs to be understood in its cultural context. The following section provides a brief overview of this study's context. The country is characterized by economic dynamism, the predominance of Islam as religion and high ethnic diversity with more than 300 ethnic groups (Blackburn, 2004). The country is the world's fourth most populous country, tenth largest economy by purchasing power and the largest economy in Southeast Asia (The World Bank Group, 2018). Society is characterized by a high degree of cultural, religious and ethnic heterogeneity. However, as Blackburn (2004) points out, the fall of the Suharto regime, which emphasized strong role division between men and women, heralded a new era, symbolized by the election of Indonesia's first female president in 2001 (This is not to say, that the cultural echoes of the Suharto period do not prevail in many households and through norms today). Under reference to the United Nations Development Program, Schaner and Das (2016) describe Indonesia as more gender equal than Pakistan and India but less equal than China. The female to male wage ratio increased from 57 percent in 1990 to 84 percent in 2011.[9] Still, male and female labor force participation rates differ significantly and, compared to men, women tend to work more often as unpaid family workers (Schaner and Das, 2016). Schaner and Das (2016) find that younger female cohorts are more likely to enter the formal sector of employment earlier on in their lives, compared to older female cohorts who often started their careers in informal employment. Total

9. Defined as the relative median hourly wage of women compared to men.

female labor force participation has been at a level of around 60 percent in the most recent past.

Particularly relevant to this study is the work by Frankenberg and Thomas (2001) and their account of measuring power in the context of Indonesian households. Frankenberg and Thomas (2001) acknowledge gifts to family members as one decision domain with particularly high rates of discordance. They find that Indonesian household decisions are subject to the country's diverse norms that vary by region and ethnicity. The authors find that the main decision maker strongly varies between decision domains. They suggest food and routine purchase expenditures as *female domains*, while larger expenditures appear to be a *male domain*.[10] Focus group interviews of Frankenberg and Thomas (2001) reveal that group dynamics influence response behavior. Summarizing, Indonesia's changing and diverse society make the country a relevant and interesting subject for a study of gender relationships.

3. Data

We employ data from the Indonesian Family Life Survey (IFLS), a widely used longitudinal household survey dataset. The first and last of five rounds of surveys have been conducted in 1993 and 2014 respectively. We are using the third (Strauss, Witoelar, and Sikoki, 2016), fourth (Strauss et al., 2009), and fifth wave (Strauss et al., 2004). The surveys are administered by the RAND corporation which cooperates with partners and scholars to ensure a continuing high standard of conceptualization and execution. The survey's initial design was set to be representative for 83 percent of the Indonesian population, thereby aiming to cover 7,000 households in 13 provinces (Thomas, Frankenberg, and Smith, 2001). Statistical weights are provided to adjust for changes in population composition. Interviewers did follow up with the original set of households as well as with their split-offs.[11]

The survey is based on multiple books. Each book consists of wide-ranging questions, from education to labor market activity. Some books are administered to a subset of

10. Frankenberg and Thomas (2001) base their analysis on an earlier wave (IFLS 2) of the same panel and document slightly lower rates of discordance at about 25 percent.

11. This has led to an expansion in the number of households over time. By using sophisticated follow-up designs and tracking, the survey team has been able to achieve very low rates of attrition. For the second survey wave in 1997, the authors were able to reinterview 94 percent of households (Thomas, Frankenberg, and Smith, 2001). Further information on the survey design can be found in Frankenberg and Thomas (2001) and Thomas, Frankenberg, and Smith (2001).

household members only.[12] At the core of this study is the household decision-making module in book 3A and the fertility module of book 4. Book 3A is administered to individuals who are currently married or cohabitate and whose spouses live in the same household or lived in the same household in the past six months.[13] Book 4 is administered to ever-married women who are between 15 and 49 years old. The book focuses on marital history, children and fertility. For each book, the interviewer also collects information on who responded and whether other people were present during the interview.

We only use heterosexual couples and refer to husbands, men, male spouses and wife, women, female spouses interchangeably. We omit all individuals who are not married or cohabitate, with missing age data or missing spouse data. We exclude all individuals who are neither the head of household or spouse of the head of household. This omits grandparents or married children still living in their parents' home. We do not include all individuals who neither live with their spouses nor lived with them in the six months prior to the survey. We exclude all individuals with a missing personal identifier and duplicate observations. We also only consider couples that remain *complete* following the application of these restrictions. The application of all restrictions leads to a significant reduction in sample size, the largest share of which is attributable to the exclusion of non-household heads and incomplete couples. For 2000, 2007 and 2014 a total of 21,736, 22,193 and 24,892 observations are available. Application of exclusion restrictions reduces the sample to the number of observations listed in table 1.

Table 1: Number of observations
after application of exclusion restrictions

	Number of Observations			
	2000	2007	2014	Total
Men	6,532	8,070	8,662	23,264
Women	6,532	8,070	8,662	23,264
Observations	13,064	16,140	17,324	46,528

Notes: For the majority of later analyses, couples are treated as one observation. The number of observations increases over time as the survey tracks and includes spin-off households.

12. Our main analysis is based on the household roster book K, book 3A and book 4. The household roster book K is only administered to the household head or a household member that is knowledgeable about the questions. The household roster book contains questions on all household members' income, their age and their relationship to the household head, inter alia. Book 3A is only administered to respondents who are at least of age 15.

13. See book 3A of IFLS 5 wave, questions PK00a and PK00b.

After application of exclusion restrictions, the sample carries the attributes presented in table 2. In most of our analyses, we treat one couple as one observation. We assign the male attributes as additional variables to women. We mark the husbands' values with the prefix "Spouse (Sp.)". Compared to women, men are older, are slightly better educated, earn a larger share of the household income and report almost twice as many worked hours. Very few men are unpaid family workers while 95 percent worked in the past twelve months.[14] One quarter of all women have unpaid family worker status while only 61 percent of them worked in the past twelve months. Household attributes are by definition the same for both sexes since we consider complete couples only.

14. The question asked is "Did [...] work in the last 12 months? ($>$ 5 years)".

Table 2: Descriptive statistics by sex

	Women				Men			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Individual attributes:								
Age	39.16	11.63	15	82	43.59	12.48	18	92
Elementary education	0.36	0.48	0	1	0.35	0.48	0	1
Any secondary education	0.48	0.50	0	1	0.49	0.50	0	1
Any college education	0.12	0.32	0	1	0.13	0.33	0	1
Household attributes:								
N HH adults	2.39	0.82	2	9	2.39	0.82	2	9
N HH children	1.69	1.15	0	9	1.69	1.15	0	9
Migration indicator	0.21	0.41	0	1	0.21	0.41	0	1
Household economy:								
Log HH income	16.68	1.10	9.6	21	16.68	1.10	9.6	21
Any land	0.32	0.47	0	1	0.32	0.47	0	1
Income share	0.19	0.27	0	1	0.81	0.27	0	1
Labor supply:								
Worked in past 12 months	0.61	0.49	0	1	0.95	0.21	0	1
Hours worked per annum	1,132.41	1,401.26	0	11,844	1,973.82	1,331.83	0	14,976
Unpaid family worker status	0.25	0.43	0	1	0.01	0.10	0	1
Observations	8,662				8,662			

Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Variable definitions:** N HH children: number of children in household; N HH adults: number of adults in household; Migration indicator: household moved since last wave (yes = 1/no = 0); Log HH income: Log of annual income in IDR; Hours worked per annum are stated as reported (later results are robust to exclusion of individuals reporting over 16 hours * 365 days per year; less than .8 percent do report higher values.).

4. Typology and prevalence of discordance

4.1. Typology of statement combinations

We structure concordance and discordance along a typology of statement combinations that has been developed by Ambler et al. (2017). The focus is on whether the wife has decision-making power or not and on whether the couple agrees with that.[15]

The typology reflects all possible statement combinations that can arise from the response options available to each spouse. The lead question for every domain is "In your household, who makes decisions about: [domain]". The question is asked for 13 domains, eg savings or routine purchases. Appendix table 1 presents the list of decision domains. In response, individuals can circle letters representing single household members, such as A for the respondent, B for the spouse, and so forth. Thus, each spouse can either respond that he/she makes the decision by themselves, by their spouse or that they engage in joint decision-making. Additional household members or individuals not living in the household that can be named as decision makers are identified as out of scope. If spouses do not that either of the spouses makes the decision, the couple will be assigned to a residual category as described in the following.

The typology of possible statement combinations is exhaustive: We sort all possible combinations in one (and only one) category of the typology. We omit couples in which either spouse's statement is missing. All others are included in this typology. Table 3 provides a description of each category. The first four categories (CM, CF, CB and CN) describe concordance whereas the last four (DFM, DMF, DOBOF and DONOM) describe discordance with respect to whether the wife has decision-making power. Couples of category CM give a concordant response of the husband as the sole decision maker. In couples of type CF, both spouses perceive the wife as the sole decision maker. In couples of type CB, both spouses perceive joint decision-making. Finally, couples of category CN give a concordant response that neither of the two spouses makes the decision.

The discordance categories are divided into strong and weak discordance and a residual category. The first two discordance types (DFM, DMF) describe cases in which spouses fundamentally disagree about the wife's role, two cases which we coin *strong discordance*. One partner perceives female decision-making power while the other

15. We use this *wife-focused* typology since most related studies focus on the wife's decision-making power.

does not. The third case DOBOF (weak discordance) depicts the case in which both partners fundamentally perceive female decision-making power but do not agree on whether the husband also has a say. The last, *residual* category DONOM comprises all cases in which either spouse says that the decision is made by a third person while the other spouse perceives the husband as the sole decision maker.

The typology applies to all domains but the contraceptive use decision domain. When asked for decisions on "whether you and your spouse use contraception", respondents were offered an additional "never consider the use of contraception" response option. We will refer to this option as *no use* in the following. We exclude all spousal statement combinations in which either spouse replies *no use*. We do so because the *no use* response can describe an outcome and decision at the same time. This would challenge interpretation, which is why we decide not to consider these couples. We also exclude a small group of individuals who respond that someone else in the household or someone not living in the household makes the decision (coined as "none"). Both exclusion restrictions reduce our sample size by around 34 percent for analyses in the contraception use domain. The full contraception typology including the *no use* response can be found in appendix table 2.

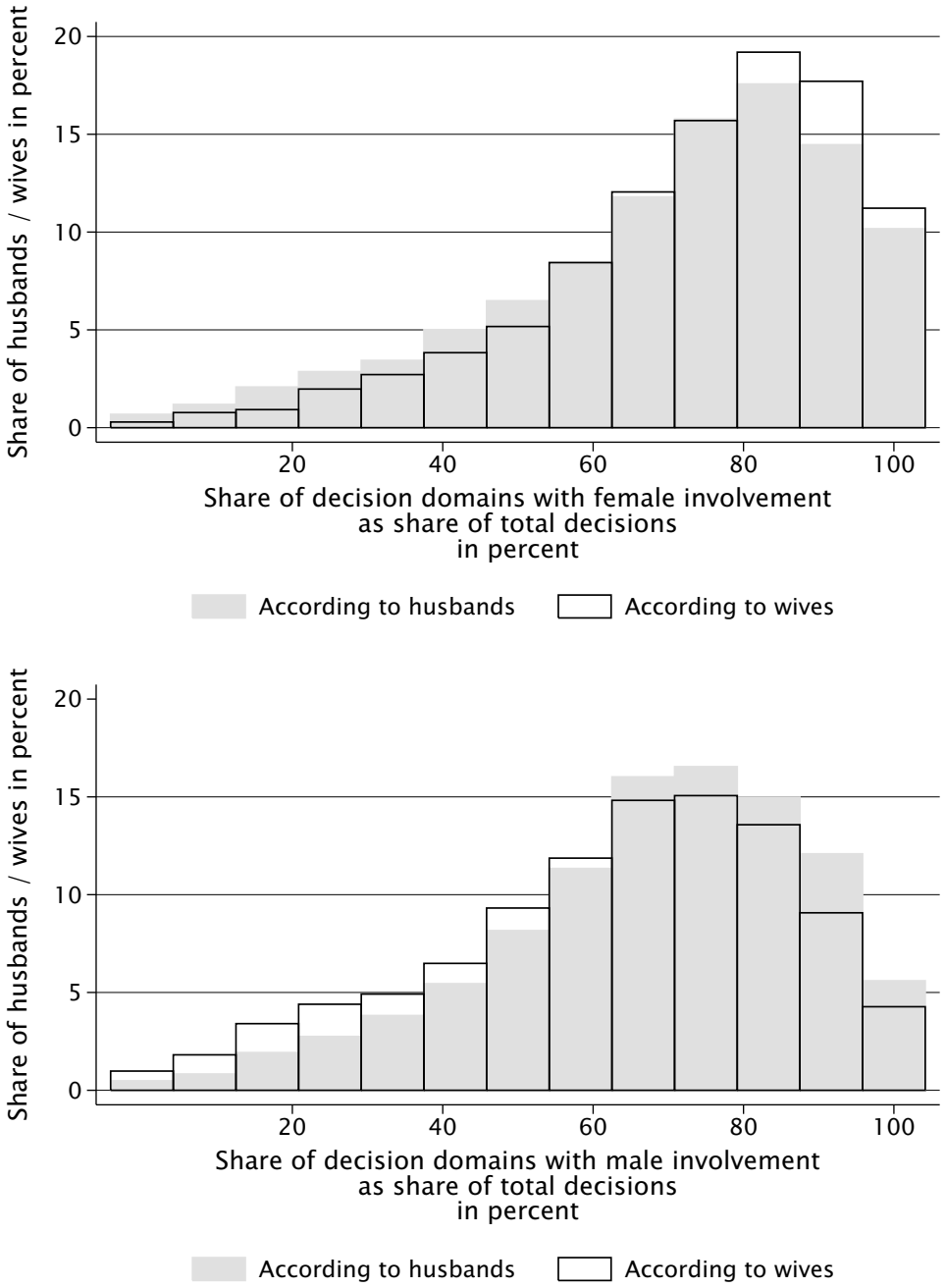
Table 3: Typology of responses of all decision domains except decisions on contraceptive use

Code	**Combination of husband's and wife's statement**	
	Concordance	
CM	Wife and Husb: (m)	Both partners perceive husband as the sole decision maker
CF	Wife and Husb: (f)	Both partners perceive wife as the sole decision maker
CB	Wife and Husb: (mf)	Both partners perceive joint decision-making
CN	Wife and Husb: (none)	Both partners perceive that neither of them makes decision
	Discordance	
DFM	Wife: (f) $\vee$ (mf); Husb: (m) $\vee$ (none)	Strong discordance: Wife perceives female decision-making power (individually or jointly), husband does not
DMF	Husb: (f) $\vee$ (mf); Wife: (m) $\vee$ (none)	Strong discordance: Husband perceives female decision-making power (individually or jointly), wife does not
DOBOF	One Spouse: (mf); Other Spouse: (f)	Weak discordance: Both spouses perceive female decision-making power, one of them perceives wife as sole decision maker, the other joint decision-making
DONOM	One Spouse: (none); Other Spouse: (m)	One of the spouses perceives that neither spouse makes the decision, the other spouse perceives the husband as the sole decision maker

4.2. Prevalence

We first analzye the general difference between male and female perception of male and female decision-making power. In figure 1, we show the overall decision-making power share of each partner from each perspective. This overall share is coded as 1 (= 100 percent) if an individual is perceived to have a say (individually or jointly) in all 13 decision domains. It is coded as 0 if an individual is perceived to not have a say in any domain. The upper histogram displays the distribution of the male and the female perception of female decision-making power. The lower histogram displays the distribution of the male and the female perception of male decision-making power. Women report a higher average female decision-making share value than their husbands. The same holds vice versa. Women perceive less male decision-making power than husbands perceive themselves.

Figure 1: Histograms of perceived female (upper graph) and male (lower graph) decision-making power



Note: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; Graph: two histograms on male and female perception of male and female decision-making power. Grey area: husband's perception. Black lined bars: wife's perception. **Scale:** upper (lower) graph: decision-making power is captured as number of household decision domains the wife (husband) is involved in over total number of household decision domains; Value 1 on x-axis indicates that wife (husband) has a say in all household decisions.

We present the prevalence of discordance per domain in tables 4 and 5 (A full list of the actual decision-making domains including the wording can be found in the appendix table 1). Between 49 and 67 percent of couples agree on who makes the decision in any decision domain (see line *Sum concordance* in the tables). The highest concordance exists with respect to routine purchases (67 percent). The lowest concordance rates are found in the domains of "Time the wife spends socializing" and "Money for monthly savings". We find that across twelve out of 13 domains, the case (DFM) occurs more or at least as often as the opposite case (DMF). This implies that it happens more often that the wife perceives female decision-making power while the husband does not than that the opposite case occurs (the opposite case is that the husband perceives female decision-making power, while the wife does not). This is insofar reasonable as women perceive higher overall female decision-making power than men do. In general, the case of weak discordance (DOBOF) occurs more often than either of the strong discordance cases (DFM, DMF) alone. Decisions on contraceptive use are excluded from the following tables, as they offer additional potential responses. Detailed statistics on contraceptive use responses can be found in appendix table 20. We find that 50 percent of couples give concordant responses. 13 percent show strong discordance and 23 percent weak discordance. 14 percent give discordant responses that include one partner reporting no use.

Table 4: Concordance and discordance by decision domain (1/2)

	Routine purchases	Your children's education	Your children's health	Large expensive purchases	Giving money to wife's family	Giving money to husband's family
	–	–	–	–	–	–
	in percent of column	in percent of column	in percent of column	in percent of column	in percent of column	in percent of column
Concordance:						
CM: Wife and Husb: (m)	0.02	0.04	0.02	0.07	0.04	0.06
CF: Wife and Husb: (f)	0.60	0.08	0.08	0.06	0.06	0.04
CB: Wife and Husb: (mf)	0.04	0.37	0.41	0.41	0.41	0.40
CN: Wife and Husb: (none)	0.01	0.06	0.05	0.01	0.02	0.02
Sum concordance	0.66	0.55	0.57	0.55	0.53	0.53
Discordance:						
DFM: Wife: (f) $\vee$ (mf); Husb: (m) $\vee$ (none)	0.08	0.15	0.14	0.13	0.14	0.17
DMF: Husb: (f) $\vee$ (mf); Wife: (m) $\vee$ (none)	0.08	0.10	0.07	0.14	0.13	0.14
DOBOF: One spouse: (f); Other spouse: (mf)	0.17	0.19	0.22	0.17	0.19	0.14
DONOM: One spouse: (none); Other spouse: (m)	0.00	0.01	0.01	0.01	0.01	0.02
Sum discordance	0.34	0.45	0.43	0.45	0.47	0.47
Observations	8,662	8,662	8,662	8,662	8,662	8,662

Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Typology:** CM: concordant report of husband as sole decision maker, CF: concordant report of wife as sole decision maker, CB: concordant report of joint decision making; CN: concordant report of neither partner as decision maker, DFM: wife perceives female decision making power, husband does not, DMF: husband perceives female decision making power, wife does not, DOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making, DONOM: one of the spouses perceives that neither spouse makes the decision, the other spouse perceives male decision maker.

Table 5: Concordance and discordance by decision domain (2/2)

	Gifts for parties / weddings	Money for monthly arisan (savings lottery)	Money for monthly savings	Time the husband spends socializing	Time the wife spends socializing	Whether you/your spouse works
	–	–	–	–	–	–
	in percent of column	in percent of column	in percent of column	in percent of column	in percent of column	in percent of column
Concordance:						
CM: Wife and Husb: (m)	0.03	0.02	0.03	0.38	0.03	0.21
CF: Wife and Husb: (f)	0.09	0.18	0.10	0.02	0.26	0.01
CB: Wife and Husb: (mf)	0.42	0.13	0.13	0.15	0.20	0.37
CN: Wife and Husb: (none)	0.00	0.21	0.22	0.00	0.00	0.00
Sum concordance	0.54	0.53	0.48	0.54	0.49	0.59
Discordance:						
DFM: Wife: (f) $\vee$ (mf); Husb: (m) $\vee$ (none)	0.12	0.15	0.17	0.24	0.13	0.23
DMF: Husb: (f) $\vee$ (mf); Wife: (m) $\vee$ (none)	0.08	0.13	0.17	0.17	0.09	0.12
DOBOF: One spouse: (f); Other spouse: (mf)	0.24	0.16	0.13	0.05	0.29	0.06
DONOM: One spouse: (none); Other spouse: (m)	0.00	0.03	0.05	0.00	0.00	0.00
Sum discordance	0.46	0.47	0.52	0.46	0.51	0.41
Observations	8,662	8,662	8,662	8,662	8,662	8,662

Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Typology:** CM: concordant report of husband as sole decision maker, CF: concordant report of wife as sole decision maker, CB: concordant report of joint decision making; CN: concordant report of neither partner as decision maker, DFM: wife perceives female decision making power, husband does not, DMF: husband perceives female decision making power, wife does not, DOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making, DONOM: one of the spouses perceives that neither spouse makes the decision, the other spouse perceives male decision maker.

5. Discordance and couple attributes

In this section we study whether discordance is *random* or whether it is systematically related to couple attributes. We do so in two steps in sections 5.1 and 5.2. First, we study the prevalence of discordance types with respect to the female income share.[16] Secondly, we relate discordance types to overall couple attributes and further proxies for female power. The observed relationship suggests that concordance is indeed related to *actual* female power.

5.1. Prevalence of discordance and female income share

Approach. In figure 6, we relate the wife's income share to the prevalence of specific types of con- or discordance in the labor supply decision domain.[17] We create one graph for each of the six types of potential statement combinations. Each graph relates the prevalence of the specific response type as the share of all responses (vertical axis) to female income share (horizontal axis).[18] We use cross-sectional data, based on the IFLS-5 (2014). This is a merely correlative, descriptive way of assessing the relationship. Since the figures display cross-sectional data only, they do not allow to infer any causal statements.

Results. The upper two graphs and the center-left graph in figure 6 confirm a positive relationship between female income and decision-making power. The share of couples that agree on the husband as the sole decision maker (type CM) stands in a negative relationship with the female contribution to household income (upper left graph). The opposite holds true for the (small) share of couples in which both partners perceive the wife as the sole decision maker (CF, upper right graph). The center-left graph shows the share of couples in which both partners agree on joint decision-making (CB). Their share among all couples is positively associated with the female contribution to household labor income.

The remaining graphs (center right and bottom row) present prevalence rates of discordant couples. The center-right graph of figure 6 shows the association between the

16. Bertrand, Kamenica, and Pan (2015) shows for the United States, a considerable more progressive country than Indonesia with respect to gender roles, that the wife's income share carries an important normative meaning. The wife's contribution to household income not only identifies her own role in society but also her relationship to the husband.

17. The question asked in this domain is "In your household, who makes decisions about: whether you/your spouse works".

18. For a definition of female income share, please refer to section 7.1.

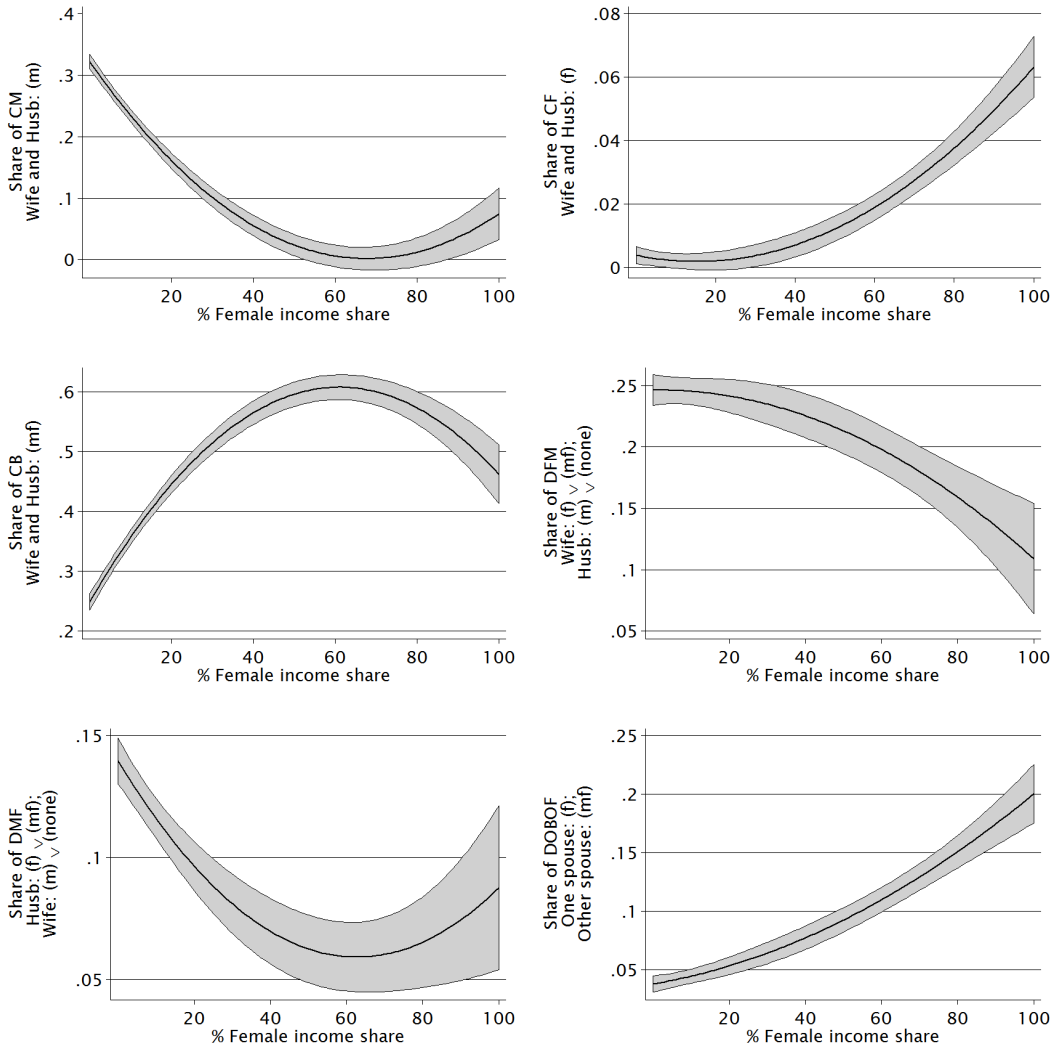
share of couples in which the wife perceives female decision-making power, while the husband does not (DFM) and the female income share. The bottom left graph shows the share of couples in which the wife does not perceive female decision-making power while the husband does (DMF) as a function of the female share in household labor income. They suggest that *strong discordance* is negatively associated with the female share of household income. The opposite holds true for *weak discordance*, displayed in the bottom right graph: The share of weakly discordant couples that fundamentally agree on a female role in decision-making but disagree on the husband's role (DOBOF) is positively associated with female income. One possible explanation is that a more pronounced female income share allows for less ambiguity that could, in turn, result in strong discordance.

5.2. Attributes of discordant couples

Approach. We divide the full sample into six subsamples based on the main six possible statement combinations in response to the question *"In your household, who makes decisions about: whether you/your spouse works"*. Couples, whose attributes are presented in columns one through three, have given a concordant statement combination. They agree on the husband as the sole decision maker, the wife as the sole decision maker or joint decision-making respectively. The remaining columns present the attributes of couples that have given a discordant statement combination. Columns four and five present attributes of couples in which either the wife perceives female decision-making power (individually or jointly) while the husband does not (column four) or vice versa (column five). In column six, we present the means for couples that agree on female decision-making power but do not agree on whether the husband also has decision-making power. We use cross-sectional data, based on the IFLS-5 (2014). Each observation is one couple. If a variable is not specified, it shows the wife's value. The husband's attributes are referred to by the prefix spouse (abbreviated by *Sp:*).

Results. The descriptive statistics in table 7 suggest that specific types of concordance and discordance are related to *actual* differences in female power. This conclusion is based on the between-subsample variation in variables that are associated with female power. The subsamples differ with respect to the wife's income share, female age, female education, and also the overall female decision-making share. Table 7 presents subsample averages. Appendix table 7 provides T-Tests on the statistical significance of subsample differences.

Table 6: Quadratic linear prediction of prevalence of statement combinations with female income share



Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Decision making domain:** "Whether you/your spouse works"; Vertical axis: frequency of single statement combination; Horizontal axis: relative contribution of the wife to household labor income (husband and wife only).

One key finding is that female income shares are substantially lower in couples with strong discordance (columns 4 and 5) compared to weak discordance (column 6).[19] The *weakly discordant* (DOBOF) group's females are also older than those in the *strongly discordant* groups (DFM, DMF). Within the concordant groups, the average female income share is lowest in those couples in which both partners agree on the husband as the sole decision maker (column 1) and highest in couples that agree on the wife as the sole decision maker (column 2).

The overall decision share across all domains corresponds to the statement combinations in the labor supply domain. The wife's self-assessed decision share (Wife: own decision share) is higher for couples that respond with DFM and DOBOF than it is for the couples responding DMF. The same holds vice versa for men. The decision share attributed by men to women (Husb: wife's decision share) is higher in the cases DMF and DOBOF than for couples responding DFM. In appendix table 7, we compare whether the aforementioned differences in income shares and overall female decision shares are statistically significant at the five percent level. We find this to be the case. We conclude that specific types of discordance do not appear to be a random artifact in our data but appear to be systematically associated with *real* female power. In a next step, we use cross-sectional regression to learn which single features have the greatest association with specific types of discordance.

19. The latter category of weak discordance implies that both spouses essentially perceive female decision-making power, but diverge for the husband's role.

Table 7: Comparison of couple attributes by con- and discordance types in labor market decision domain

	(1) CM Wife and Husb: (m)		(2) CF Wife and Husb: (f)		(3) CB Wife and Husb: (mf)		(4) DFM Wife: (f) ∨ (mf) Husb: (m) ∨ (none)		(5) DMF Husb: (f) ∨ (mf) Wife: (m) ∨ (none)		(6) DOBOF One Spouse: (f) Other Spouse: (mf)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Individual attributes:												
Age	35.94	11.01	44.77	11.69	40.32	11.19	38.58	11.60	39.46	12.16	43.61	12.02
Sp: age	40.68	11.69	51.21	14.11	44.37	12.17	42.96	12.24	44.27	13.01	48.43	13.41
Elementary education	0.36	0.48	0.52	0.50	0.32	0.47	0.38	0.49	0.40	0.49	0.40	0.49
Any secondary education	0.56	0.50	0.38	0.49	0.44	0.50	0.49	0.50	0.47	0.50	0.42	0.49
Any college education	0.05	0.22	0.05	0.22	0.19	0.39	0.08	0.28	0.08	0.27	0.11	0.31
Sp: Elementary education	0.35	0.48	0.46	0.50	0.33	0.47	0.37	0.48	0.36	0.48	0.43	0.50
Sp: Any secondary education	0.55	0.50	0.46	0.50	0.47	0.50	0.50	0.50	0.48	0.50	0.44	0.50
Sp: Any college education	0.09	0.28	0.02	0.16	0.17	0.38	0.10	0.30	0.13	0.33	0.09	0.29
N HH children	1.74	1.09	1.50	1.18	1.66	1.17	1.70	1.14	1.75	1.13	1.57	1.22
N HH adults	2.39	0.85	2.34	0.79	2.37	0.78	2.40	0.85	2.39	0.77	2.47	0.92
Migration indicator	0.24	0.43	0.26	0.44	0.21	0.41	0.21	0.40	0.22	0.41	0.16	0.37
Any land	0.26	0.44	0.17	0.38	0.35	0.48	0.32	0.46	0.34	0.47	0.33	0.47
Household economy:												
Log HH income	16.59	1.00	16.44	1.12	16.83	1.15	16.65	1.05	16.56	1.09	16.56	1.26
Female income share	0.05	0.15	0.54	0.39	0.28	0.29	0.16	0.24	0.13	0.24	0.36	0.35
Log h worked pa	6.24	1.68	7.27	0.84	7.22	1.03	6.91	1.28	6.74	1.43	7.17	1.14
Sp: Log h worked pa	7.41	0.86	7.30	1.05	7.39	0.89	7.41	0.90	7.39	0.93	7.26	1.05
Decision share:												
Wife: Own decision share	0.61	0.21	0.81	0.17	0.82	0.16	0.79	0.17	0.61	0.22	0.76	0.18
Husb: Wife's decision share	0.58	0.23	0.76	0.19	0.81	0.17	0.59	0.22	0.78	0.19	0.78	0.18
Wife: Husband's decision share	0.62	0.21	0.30	0.26	0.68	0.21	0.62	0.24	0.62	0.22	0.45	0.26
Husb: Own decision share	0.66	0.19	0.30	0.23	0.72	0.19	0.65	0.21	0.69	0.22	0.58	0.26
Observations	1,849		82		3,186		1,990		998		542	

Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Decision making domain:** "Whether you/your spouse works"; **Variable definitions:** N HH children: number of children in household; N HH adults: number of adults in household; Migration indicator: household moved since last wave (yes = 1/no = 0); Log HH income: Log of annual income in IDR; Wife:/Husb.: provides wife's/husband's perspective on decision making power respectively; **Typology:** CM: concordant report of husband as sole decision maker, CF: concordant report of wife as sole decision maker, CB: concordant report of joint decision making; CN: concordant report of neither partner as decision maker, DFM: wife perceives female decision making power, husband does not, DMF: husband perceives female decision making power, wife does not, DOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making, DONOM: one of the spouses perceives that neither spouse makes the decision, the other spouse perceives male decision maker.

6. Discordance and outcomes

Results in section 5 suggest that a shared perception of female power is associated with higher *actual* female decision-making power. Accordingly, we also hypothesize that labor and fertility outcomes correspond to this pattern. The endogenous relationship between power and outcomes prevents any form of causal interpretation. However, the strength of the relationship is of interest as the outcomes allow to proxy the degree of female power in a couple, assuming that labor supply and contraceptive use are indicative of female power. A strong relationship between couples' statement combinations and outcomes will inform our idea of female power in couples of a specific statement combination type. Further, outcome prediction is a goal on its own and any insight gained will be informative in this regard.

The first three subsections of this section relate to specific outcomes, for example, labor supply, to a couples' perception of female power as expressed in their statement combinations. We group statement combinations along the previous typology to learn about outcome differences between the groups captured in the typology. In the fourth subsection, we slightly change our focus to study the merit of incorporating both spouses' perspectives. We do so by holding the female perception constant and varying the husband's one.

6.1. Female labor supply

Female labor supply is both a determinant and consequence of female decision-making power.[20] The following analysis is built on this assumption of a bi-directional relationship between perceived female decision-making power and labor outcomes. Based on previous evidence, we hypothesize that labor supply is higher where female power is higher. Variation between different typology groups will inform our idea of female power within these groups.

Approach. We estimate a standard OLS model. We use cross-sectional data, based on the IFLS-5 (2014). We estimate three labor outcomes in three distinct models. All outcomes are captured in the vector $LABOROUTCOMES$. The three outcomes are employment status, hours worked and status as an unpaid family worker. Employment status is an indicator variable, coded as 1 if a woman has worked in the past twelve

20. Goldin (2006, p. 1) argue that the nature of female decision-making "horizons" are linked to expectations about future female labor participation. Accordingly, Basu (2006) document the bi-directional relationship between decision-making and economic power.

months and zero if not (This includes any work in- and outside of the household, except work classified as unpaid family work). Working hours per annum are coded as the product of hours worked per week and weeks worked per year.[21] Unpaid family worker status is coded as an indicator variable. It takes on the value one if an individual is considered an unpaid family worker and zero if not.[22]

$$LABOROUTCOMES_i = \beta_0 + \beta_1 SCL_h + \beta_2 INDIVIDUAL_i + \beta_3 HOUSEHOLD_h + \rho_1 PROV_i + \varepsilon_i \quad (1)$$

The vector SCL_h contains indicator variables for all possible types of spousal statement combinations to the question: "In your household, who makes decisions about: whether you/your spouse works". We omit the indicator variable for the group which gives a concordant report on the husband as the sole decision maker (CM). Thus, the vector consists of 7 indicator variables for the seven statement combination by the couple as listed in table 3, except for case CM.

The level of observation is that of a household. The vector $INDIVIDUAL_i$ contains attributes of the household's individuals while $HOUSEHOLD_h$ contains household attributes. The included individual attributes comprise the individual's educational level[23] and age for both husband and wife. Male values are indicated by "Sp:" for the spouse. The household variables of vector $HOUSEHOLD_i$ capture the number of members of the household (number of all adult members and number of all children), the log of household income and a migration variable indicating whether the household moved since the last time it was surveyed. $PROV_i$ is a vector of province dummies and ε_i is an idiosyncratic error term. Robust standard errors in parentheses are clustered at level of the region.

Results. Table 8 presents the estimates for the relationship between spousal (dis-)

21. Respondents can provide information on two main jobs in Book 3A of the survey. We use combined statements for the first job on hours (tk22a) and weeks (tk23a) as well as for the second job (tk23b, tk22b respectively) and calculate the sum.

22. There are two opportunities in the survey at which an individual can be classified as an unpaid family worker. We only consider someone to be an unpaid family worker if he or she are classified as such in the family roster (Within survey book K of IFLS wave 5, this is asked as question AR15b: "What were the total earnings of [...] in the last 12 months?" Response options are the salary, "Unpaid Family Worker" and "Don't Know").

23. Each individual is assigned based on the highest educational level that they attended. We cluster all levels into the four groups of a) no education, b) elementary education c) secondary education and 3) tertiary education. Please refer to appendix table 3 for the distribution and a further specification of the grouping.

agreement and female labor force participation in a cross-sectional OLS estimate using 2014 data. The likelihood of female employment is highest in couples in which both partners perceive female decision-making power, whether con- or discordant regarding the men's role (see coefficients CF, CB, DOBOF in column one).[24] Female labor force participation is lowest in couples in which the husband makes decisions alone (omitted, baseline result) or in which the partners are strongly discordant (see coefficients DFM, DMF). This pattern also holds true for annual worked hours (column 2). Compared to the baseline group, the likelihood of the wife working as an unpaid family worker is lower in all other groups. The point estimates suggest that female unpaid family workers are particularly unlikely to be found in families with both partners agreeing on the wife as the sole decision maker. Point estimates further suggest a (statistically insignificant) difference between the strong and weak discordance categories (DFM, DMF and DOBOF respectively).

It is important to acknowledge that female decision-making power cannot be considered to be an explanatory variable. Looking at the different degrees of correlation with various form of discordant statements is still informative. Our preliminary conclusion is that female decision-making power is higher in couples in which both partners perceive female decision-making power, relative to cases of strong discordance about the female role and relative to concordant reports on the husband as the sole decision-maker.

6.2. Use of contraception and covert contraception methods

Previous evidence has shown that women and men tend to differ in their desired number of offspring. In societies with strong traditional norms, husbands tend to report higher overall fertility preferences than their wives (Rasul, 2008b; Mbaye and Wagner, 2017; Westoff, 2010). The first model of this section estimates the relationship between couples' statement combinations and contraceptive use. Accordingly, we hypothesize that contraceptive use is an expression of female power. Furthermore, women choose different strategies to realize their preferences. One of them is covert contraceptive use (Gasca and Becker, 2017). In this section's second model, we estimate the relationship between couples' statement combinations and covert contraceptive use. This is built on the hypothesis that women of lower power need to resort to covert methods. We hypothesize that higher female power will manifest itself in higher rates of contraceptive

24. At this point we do not focus on those who reply "none" (One of the spouses perceives that neither spouse makes the decision, the other spouse perceives male decision maker) as we consider this to be an exception of little overall relevance. We observe 43 cases in total in all three surveys (with 23,111 total observations).

Table 8: Types of concordance and discordance and their association with labor outcomes

	Dependent variables:		
	(1) Wife working (Yes = 1/ No = 0)	(2) Hours worked (in h worked pa)	(3) Unpaid family worker (Yes = 1/ No = 0)
Concordance:			
CF: Wife and Husb: (f)	0.519***	965.459***	-0.270***
	(0.026)	(151.455)	(0.043)
CB: Wife and Husb: (mf)	0.483***	1046.775***	-0.089***
	(0.021)	(51.719)	(0.027)
CN: Wife and Husb: (none)	0.603***	1513.335***	0.528***
	(0.033)	(85.707)	(0.037)
Discordance:			
DFM: Wife: (f) ∨ (mf); Husb: (m) ∨ (none)	0.278***	540.927***	-0.093***
	(0.014)	(50.530)	(0.021)
DMF: Husb: (f) ∨ (mf); Wife: (m) ∨ (none)	0.199***	375.575***	-0.039*
	(0.025)	(59.270)	(0.023)
DOBOF: One spouse: (f); Other spouse: (mf)	0.448***	1008.506***	-0.184***
	(0.024)	(94.345)	(0.027)
DONOM: One spouse: (none); Other spouse: (m)	0.014	371.200	-0.307***
	(0.109)	(335.884)	(0.104)
Household attributes:			
Log HH income	0.041***	221.281***	-0.053***
	(0.008)	(25.779)	(0.014)
Constant	-0.332**	-3.4e+03***	1.408***
	(0.119)	(392.423)	(0.191)
Control for (spousal) age and education	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓
Region dummies	✓	✓	✓
Observations	7,562	7,562	4,802
R^2	0.22	0.16	0.14
Clusters	19	19	19
Robust standard errors clustered at regional level	Yes	Yes	Yes

Notes: Standard OLS estimate; **Dependent variable:** employment status of wife (binary), reported hours worked per year (weekly hours multiplied with weeks worked) and status as unpaid family worker (binary); **Baseline group:** concordant couples, perceiving husband as the decision maker; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Decision making domain:** "Whether you/your spouse works"; **Typology:** CM: concordant report of husband as sole decision maker, CF: concordant report of wife as sole decision maker, CB: concordant report of joint decision making; CN: concordant report of neither partner as decision maker, DFM: wife perceives female decision making power, husband does not, DMF: husband perceives female decision making power, wife does not, DOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making, DONOM: one of the spouses perceives that neither spouse makes the decision, the other spouse perceives male decision maker; Robust standard errors in parentheses are clustered at regional level; ***/**/* indicate significance at the 1%/5%/10% level.

use and lower rates of covert method use.

6.2.1. Use of contraception

Approach. We estimate the relationship between perceived female decision-making power and contraceptive use. We estimate a standard OLS model. We use cross-sectional data, based on the IFLS-5 (2014). The main dependent variable of interest is $ContraceptiveUse_i$, an indicator variable, which takes on the value 1 if the wife reports using contraception, and zero if she reports not using contraception. Contraceptive use is reported by women in a dedicated interview book.

$$ContraceptiveUse_i = \beta_0 + \beta_1 SCC_h + \beta_2 INDIVIDUAL_i + \beta_3 HOUSEHOLD_h + \rho_1 PROV_i + \varepsilon_i \quad (2)$$

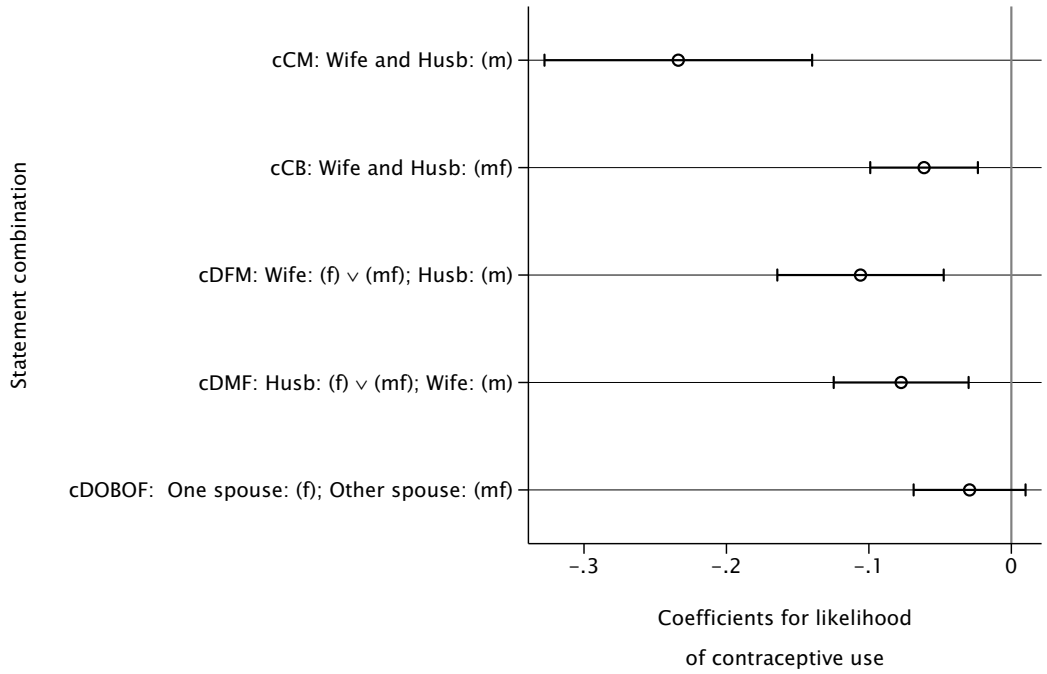
We introduce a vector SCC_h that contains indicator variables for all possible statement combinations to the question on "In your household, who makes decisions about: whether you and your spouse use contraception". The vector consists of one indicator variable for each possible statement combination by the couple as listed in table 2, except for the statement combination cCF. Diverging from our previous labor supply model, we omit the indicator variable for the group which gives a concordant report on the wife as the sole decision maker (cCF). We use this reference group because our previous reference group (sole male decision maker) is a rare exception in response to this question, with only a small share of couples (N = 119) giving this response. The vectors $INDIVIDUAL_i$, $HOUSEHOLD_h$, $PROV_i$ and ε_i are modeled the same way as in the previous model. Robust standard errors in parentheses are clustered at level of the region.

Results. Results are presented in figure 2. The regression table can be found in appendix table 8, column two.[25] We estimate the highest likelihood of contraceptive use for our baseline category: couples that agree on a sole female decision maker. The lowest likelihood of contraceptive use is estimated for couples that agree on the husband as the sole decision maker (cCM). It is significantly higher for couples that agree on joint decision-making (cCB). Compared to the baseline category, contraceptive use is expected to be lower for the two strongly discordant groups (cDFM, cMDF). The estimated rate of contraceptive use in weakly discordant couples (cDOBOF) is not

25. In table 8, we run five specifications. While one specification (column 1) runs the baseline model without controls, the other three specifications exclude subgroups of women. Please refer to the robustness section 8 for further comments.

statistically different from the baseline group. We conclude that outcomes differ based on whether or not couples show discordant opinions. The second analysis in section 6.3 permits to learn more about the value of taking both spouses' perspectives into account.

Figure 2: Contraceptive use across statement combinations: coefficient estimates



Note: Standard OLS estimate; **Dependent variable:** contraceptive use (Yes = 1/No = 0); **Baseline group:** concordant couples, perceiving wife as the sole decision maker; **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Decision making domain:** "whether you and your spouse use contraception"; **Typology:** cCM: concordant report of husband as sole decision maker, cCB: concordant report of joint decision making, cDFM: wife perceives female decision making power, husband does not, cDMF: husband perceives female decision making power, wife does not, cDOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making; Robust standard errors are clustered at regional level; Ticks indicate 95 percent confidence interval.

6.2.2. Use of covert contraception methods

Approach. We estimate the relationship between perceived female decision-making power and covert contraceptive use conditional on contraceptive use. For this, we distinguish between non-covert and covert contraception methods. The main underlying assumption is that women of higher power do not need to conceal their contraceptive use by using covert methods. We define covert methods as those methods that tend to

allow women to use contraceptives more discretely.[26] One example of a method that is very difficult to conceal is condom use. Contrastingly, injections are easier to use covertly. Mere use does not imply that they use them covertly.[27] We rely mostly on other literature to identify each of the reported methods as either covert or not covert. See table 4 for an explanation for the classification.

We use cross-sectional data, based on the IFLS-5 (2014). We follow the specific typology described in the previous section. We only use couples in which *no* partner reports *no use*. The dependent variable is $CovertMethod_h$. All methods are coded as either covert (value of $CovertMethod_h = 1$) or non-covert (value of $CovertMethod_h = 0$).

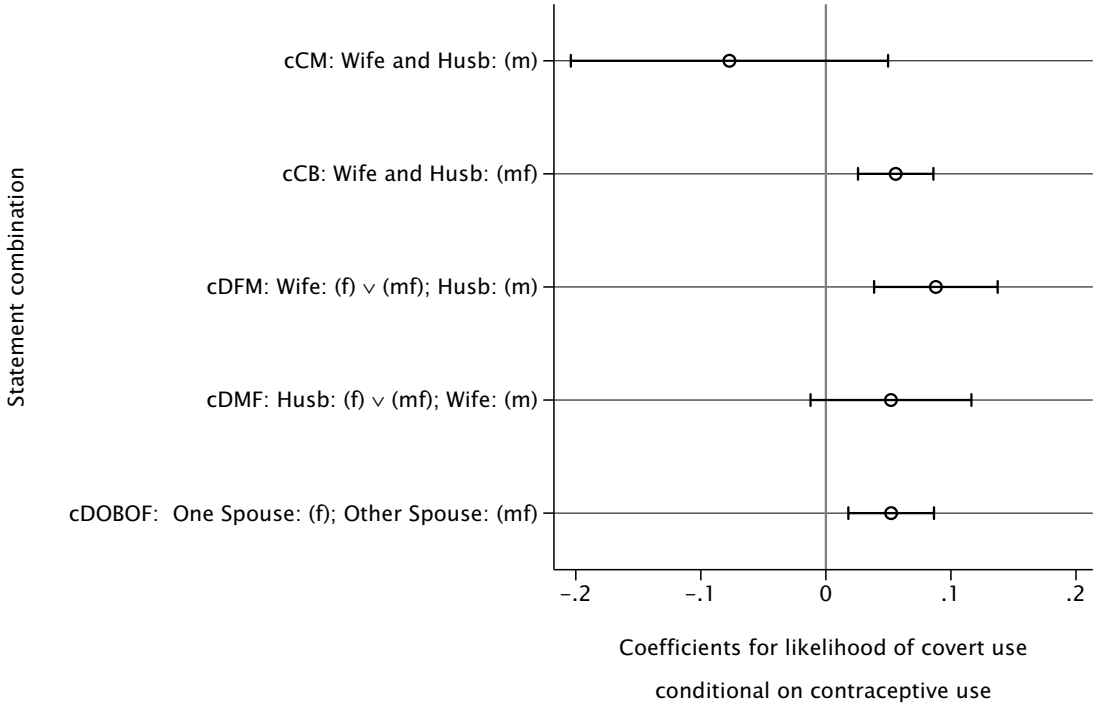
$$CovertMethod_h = \beta_0 + \beta_1 SCC_h + \beta_2 INDIVIDUAL_i + \beta_3 HOUSEHOLD_h + \rho_1 PROV_i + \varepsilon_i \quad (3)$$

Results. Results are presented in figure 3 and the regression table is presented in appendix table 9. We find that all discordant couples have estimated higher rates of covert contraceptive use compared to baseline couples that agree on the wife as the sole decision maker, although only two out of three are statistically different from zero. We find slightly higher rates of covert method use in couples that agree on joint decision-making compared to the omitted group of couples that agree on the wife as the sole decision maker.

26. Gasca and Becker (2017, p. 4) define contraceptive methods as "The contraceptive methods most likely used covertly are those that can be easily hidden from a spouse, have few side-effects and can be easily utilized."

27. Biddlecom and Fapohunda (1998) show that women use methods both covertly and openly that are easier and harder to conceal.

Figure 3: Covert method use across statement combinations conditional on contraceptive use: coefficient estimates



Note: Standard OLS estimate; **Dependent variable:** covert contraceptive use (Yes = 1/No = 0) conditional on contraceptive use; **Baseline group:** concordant couples, perceiving wife as the sole decision maker; **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Decision making domain:** "whether you and your spouse use contraception"; **Typology:** cCM: concordant report of husband as sole decision maker, cCB: concordant report of joint decision making, cDFM: wife perceives female decision making power, husband does not, cDMF: husband perceives female decision making power, wife does not, cDOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making; Robust standard errors are clustered at regional level; Ticks indicate 95 percent confidence interval.

6.3. Prediction of outcomes with both spouses' perspectives

By default, most previous studies use the wife's perspective only. The previous part of this section established that outcomes vary by type of con- and discordance. In this section, we explicitly test whether the prediction of outcomes can be improved if the husband's perspective is taken into account.

Approach. We estimate all previous baseline models for labor and contraceptive use outcomes again with a new, alternative typology. Before, we used a typology that *sorts* couples by their perception of female decision-making power.

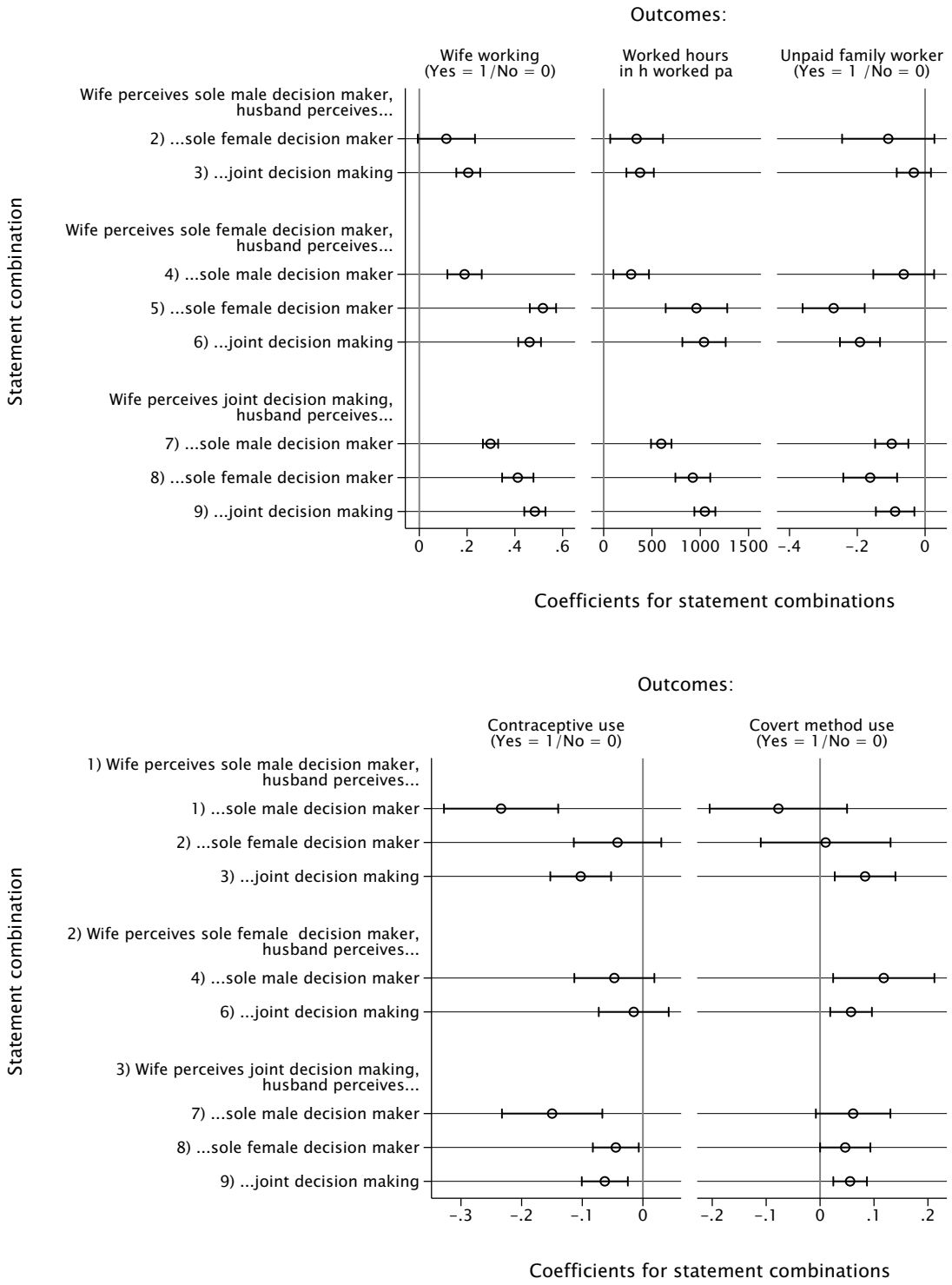
Now, we first sort couples by the wife's response. We limit our analysis to three potential responses: perception of a sole male decision maker, a sole female decision maker and joint decision-making. We omit couples in which the wife responded that neither partner makes the decision.[28] Within the female response groups, we create three new-subgroups for each possible response by the husband. Again, we limit our analysis to the three responses stated previously. The combination of three female responses and three male responses yields nine possible statement combinations.

We introduce one indicator variable for each possible combination. We use this indicator vector instead of the previous vectors (SCL and SCC) in the baseline model equations 1 and 2. All other baseline specifications remain the same. We omit the same groups as before. For the estimation of labor outcomes, we omit the indicator for the couples in which both spouses perceive a sole male decision maker. For contraceptive and covert contraceptive use outcomes, we omit the indicator for concordant couples that perceive a sole female decision maker.

Results. In figure 4, we find that including the husband's perspective can improve the prediction of outcomes. Outcomes often vary by type of male response, holding the female response constant. For labor outcomes, the baseline group is that of concordant couples, in which both spouses perceive a sole male decision maker. Within all three subgroups (2,3 and 4,5,6 and 7,8,9), female labor force participation is higher if the husband states that decisions are made jointly as opposed to by himself as the sole decision maker. The male perspective hence allows predicting outcomes more precisely. Results on working hours confirm this. These results are substantial. The estimated difference between groups 4 and 6 is around 700 annual working hours. The only within-group difference in the unpaid family worker column is found for groups 4 and 5. For contraceptive use, we also confirm that in some cases, the male perspective will improve our predictions. If the wife perceives a sole male decision maker and if her husband concurs, the likelihood of her using contraceptives is significantly lower than if her husband reports that she is the sole decision maker. With respect to covert use, we observe that rates of covert use are higher in the cases 4 and 6 compared to the omitted group number 5.

28. For the response to the question "whether you/your spouse works", we thereby exclude less than 1 percent of the total sample. For the contraception analysis, we exclude around 34 percent of all observations, because we also exclude all couples that report *no use*. We do so as inclusion would challenge interpretation. The no use response describes an outcome as well as a decision.

Figure 4: Prediction of outcomes with both spouses' perspectives: coefficient estimates



Note: Standard OLS estimate; Dependent variables listed on top of subgraphs; **Upper three graphs: Baseline group:** concordant couples, perceiving husband as the decision maker; **Decision making domain:** "Whether you/your spouse works"; **Lower two graphs: Baseline group:** concordant couples, perceiving wife as the sole decision maker; **Decision making domain:** "whether you and your spouse use contraception"; **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; Robust standard errors are clustered at regional level; Ticks indicate 95 percent confidence interval.

7. Changes in female economic resources and decision-making power

We established that female outcomes vary between groups that differ in their perception of female power. In this section, we study how male and female perception diverge *if* female economic power changes. The goal is to learn about (potential) bias that could arise in studies that are based on one-sided surveys. In order to achieve this, we pursue two approaches: one based on a fixed effects model and one based on an instrumental variable model.

7.1. Fixed effects model

We study the relationship between changes in female income share and changes in female decision-making power from both spouses' perspectives. We are interested in whether the association between either spouse's perception is more responsive to changes in female income contribution. We employ a fixed effects model to account for unobserved heterogeneity and to study changes in female economic resources and decision power over time. The fixed effects approach can control for unobserved heterogeneity between couples. However, it cannot account for the *dynamic*, bi-directional interaction of income and power over time. That is, we cannot determine in which way economic resources and decision-making power influence each other. We argue, however, that the general *strength* of relationship is of informational value.

Approach. We run two fixed effects models per decision domain, one to reflect the husband's perception and one to reflect the wife's perception. The main dependent variable of interest is whether the wife (husband) perceives the wife to have decision-making power in a given domain. Our dependent variable takes on the value 1 if the wife (husband) perceives female decision-making power in a domain, and zero if not. Accordingly, we run 26 models: two for each of the 13 domains. We use panel data, based on IFLS waves 3, 4 and 5. The vector of all 26 outcome variables is denoted $FemDecShare_{w,d,i,t}$. PFDMP expresses the perceived female decision-making power (PFDMP) of wife w in decision domain d as perceived by wife or husband i in period t.

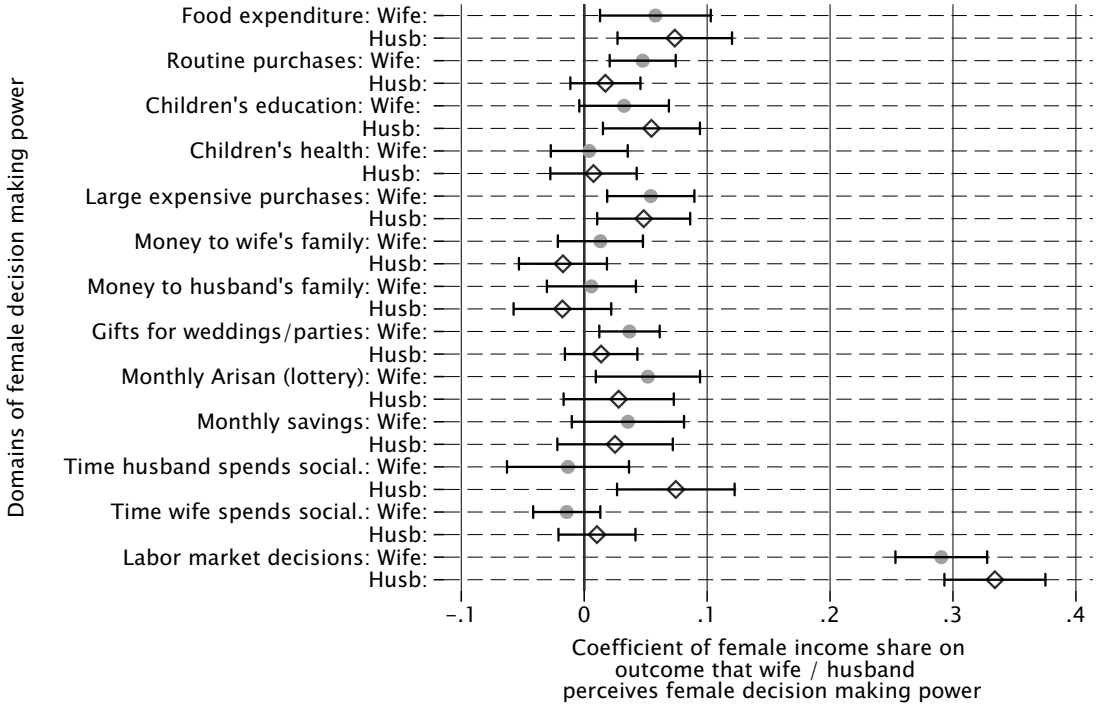
The predicting variable of interest is the female's income share $FemIncShare_{h,t}$. The income share is the wife's contribution to household labor income divided by the sum of wife's and husband's income.[29] We use individual income as stated by the household head. We set income to zero if a subject has "not worked in past 12 months". We do not exclude unpaid family workers. We do so because economic inactivity is relevant to define a baseline of power. The income share is then calculated as the female income over the sum of male and female income. The data offer estimates of income based on *unfolding brackets* for individuals who did not report their income. We disregard those, as including them would require making many assumptions. The remaining variables are analogous to previous models. Time-invariant variables, such as educational level, are excluded. The model is specified as follows.

$$FemDecShare_{w,d,i,t} = \beta_0 + \beta_1 FemIncShare_{h,t} + \beta_2 INDIVIDUAL_{i,t} + \beta_3 HOUSEHOLD_{h,t} + \rho_1 PROV_{i,t} + \varepsilon_{i,t} \quad (4)$$

Results. We can confirm the association between female economic and decision-making power. The results are presented in figure 9. The figure presents the coefficients of female income share across all 26 models. Detailed estimates are to be found in the appendix section C.3. A positive increase in female income share over time is associated with a perceived female decision-making power increase. This holds true for both perspectives. From the husband's perspective, female income share is positively associated with female decision power in the domains of children's education and the husband's time spent socializing. Women tend to perceive their own decision-making power in the domains of routine purchases, monthly Arisan (lottery), and gifts for weddings/parties when their income share increases. Both women and men tend to perceive more female power over food expenditure, large, expensive purchases and labor market decisions when the female income share increases. The within-domain estimates are not significantly different from each other between men and women. One-sided surveys might draw different conclusions within specific domains, dependent on whether they take the husband's or the wife's perspective into consideration. That is, because some effects are statistically significantly different from zero for women (men), while they are not for men (women). However, there is no statistically significant within-domain difference at the five percent level in the elasticity of the male and female perception of female power with respect to changes in female income.

29. By design, a gain in relative female income share implies a loss in male income share as the function is $1 - FemaleIncomeShare = MaleIncomeShare$.

Table 9: Association of female income and decision-making power across domains: summary of coefficients



Note: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision-making power in specific domain; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; Ticks indicate 95 percent confidence interval; Please see appendix section C.3 for numeric estimation results.

7.2. Instrumental variable model

Approach. For this model, we exploit natural disasters and crop loss as a shock to household income shares to study the relationship between female economic and decision-making power. For the first stage, we regress the female share in labor income on the instrument vector $SHOCK_i$. In order to code $SHOCK_i$, we use information in IFLS-3 wave (2000) data on exposure to two possible events (natural disasters and crop loss) and six possible household labor supply reactions. For example, one possible reaction is that a household member started working for pay. All recorded events are listed in appendix table 5 and the possible household reactions are listed in appendix table 6

There is one indicator variable for each of the six reactions to each of the two events. Thus, the vector comprises twelve indicator variables in total. The default coding of each indicator variable is 0. If a household has been exposed to an event **and** reacted to the event, the respective indicator variable is coded as 1. For example, the indicator variable for event e_1 and reaction r_1 is coded 1 if and only if the household responds that it was affected by disaster e_1 **and** reacted in way r_1. If it did neither show reactions $r_{2,3,4,5,6}$ to event e_1 nor experienced e_2, all other eleven variables will also take on the value zero.

The household does not report whether it was the wife or husband or another household member who adjusted their labor supply. However, first stage estimates in appendix table 18 suggest that crop losses reduce the female income share, on average. This is in line with previous findings.[30] Following natural disasters, the picture is more nuanced: If a household member changed or quit their job, the female income share tends to increase. If a family member takes on an additional job, the female income share tends to decrease (This appears sensible given that the *average* wife does not work. The average additional job is thus expected to be taken on by the husband.) As crop loss and the severity of exposure to natural disasters are associated with ownership of land, we estimate two models. One for the subsample of landowners and one for the full sample, controlling for land ownership. The vectors $INDIVIDUAL_i$, $HOUSEHOLD_h$, $PROV_i$ and ε_i are modeled in the same way as in the previous section. The resulting first stage equation is as follows.

30. Kochar (1999) find for India that men tend to adjust their labor supply in order to account for crop loss. Cameron and Worswick (2003) use IFLS 1990 data and find that the average household response to crop loss is a shift from *unproductive* farm work to more productive work outside of the household.

$$FemIncShare_h = \beta_0 + \beta_1 SHOCK_i + \beta_2 INDIVIDUAL_i + \beta_3 HOUSEHOLD_h + \rho_1 PROV_i + \varepsilon_i \quad (5)$$

The reduced form equation estimates the effect of instrumented changes in female income share on perceived female decision-making power. Female decision-making share is measured as decision share over all domains ($FemDecShare_i$). We estimate it for husband and wife separately. For example, if a couple reports on 13 domains and the wife perceives female decision-making power in twelve out of these domains, the variable would take on the value .92. The husband's assessment might differ, taking on any value between 0 and 1. A perfectly concordant egalitarian couple would be assigned the value one for both spouses.

$$FemDecShare_i = \beta_0 + \beta_1 FemIncShare_h + \beta_2 INDIVIDUAL_i + \beta_3 HOUSEHOLD_h + \rho_1 PROV_i + \varepsilon_i \quad (6)$$

Results. If the female income share changes, women adjust their perception of their own power slightly more than men adjust their perception of female power. However, this difference is not statistically significant. Table 10 presents the reduced form results. Appendix table 18 provides the first stage estimates. One-sided surveys will yield similar conclusions, irrespective of whether they use the husband's or the wife's perspective. In appendix table 17, we use a fixed effects approach to estimate the relationship between the wife's income share and her overall decision share. The analysis yields results similar to this estimation, supporting the robustness of the IV approach.

Table 10: IV Model reduced form results: instrumented female income share's effect on wife's and husband's perception of female power

	Dependent variable: overall female decision-making share from the perspective of the...			
	(1) ...wife (Land-owners only)	(2) ...husband (Land-owners only)	(3) ...wife (Full sample)	(4) ...husband (Full sample)
Female income share	0.561***	0.547***	0.532**	0.489**
	(0.210)	(0.200)	(0.214)	(0.198)
Any land			0.034***	0.036***
			(0.012)	(0.011)
Constant	0.561***	0.652***	0.466***	0.524***
	(0.105)	(0.104)	(0.091)	(0.088)
Control for (spousal) age and education	✓	✓	✓	✓
Control for HH income, N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	2,276	2,276	6,053	6,053
Underid. F-Statistic	20.8	20.8	18.5	18.5
Underid. P-val.	0.0228	0.0228	0.0468	0.0468
Weak id. F-Statistic	13.49	13.49	14.45	14.45
Overid. F-Statistic	7.625	13.45	10.15	20.50
Region dummies	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Reduced form IV results; **Dependent variable:** female share in household decision-making across all decision domains; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS-3 wave (2000), cross-sectional data, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

8. Robustness checks

In order to verify the robustness of our results, we have conducted five checks. First, we run the cross-sectional models on alternative data. We use alternative data from the IFLS-4 Survey (2007).[31] Results are presented in appendix section **??**. Except for one bar, the histogram results are of similar shape. Additionally, the labor outcomes analysis supports previous conclusions. The contraception results are statistically insignificant at the five percent level, however. This *deviant* finding might be driven by two factors. Due to survey design, new and young couples enter the survey from 2007 through 2014. Relatedly, we observe a change in contraception method mix over time (see appendix table 19). A longitudinal survey design with a focus on contraception might shed light on the question how and why contraceptive use changed over time. Results are not reported but available upon request.

Secondly, one might suspect that discordance is a phenomenon that is mainly driven by a subsample that is consistently discordant while other couples are consistently concordant. To check this, we study the within-household covariance of discordance across domains (results not reported in this paper). We cannot confirm that it is a single group of individuals displaying *consistent inconsistency*. The average discordance rate is 37 percent, and only 10 percent of all couples show now discordance at all. Appendix table 25 cross-tabulates statement combinations in the labor supply and contraceptive decision domains. While there is some correlation between statements, it is not possible to predict one with the other. Remarkably though, 49.3 percent of couples that agree on joint decision-making on labor supply also do so on contraception.

Thirdly, we check whether our model is robust to alternative specifications of household income shares. In our main specifications, we assign zero income to individuals whose spouses report income and who have not worked in the past twelve months. We do so, as we do consider this to be a better reflection of true average female economic power than dropping all observations of economically inactive women. For example, unpaid family workers are disproportionately often women and usually do not report income. The fact that they do not have command over disposable income is an important empirical insight. However, one might be afraid of this biasing our results, in particular, if non-reporting is associated with power. We provide an alternative specification in appendix section E.1. We code non-reported income as missing (income is for example

31. Our cross-section estimates on the association between spousal statements and labor outcomes and contraceptive use outcomes are based on cross-section data from IFLS-5 wave (2014).

not reported if an individual did not work in the past 12 months) and omit the full couple for the analysis. Our findings are robust to this alternative specification, but standard errors grow, as one would expect. Results for the fixed effects analysis also do not differ, if one limits the analysis to couples in which the wife's share decreases (increases).

Fourthly, we check the validity of our instrumental variable approach to address the concern that a subset of regions was particularly exposed to shocks. If these regions also differed in other unobservable ways from the other regions, this might induce bias. Appendix section D.2 shows that all but one regions have been subject to at least one of the shocks we instrument for. We also provide an alternative coding of our instrument in section E.2. This is based on the inclusion of additional instruments. This model does not pass identification tests. It yields estimates of a similar order of magnitude as our main results.

Fifthly, we check whether our main OLS results are robust to probit estimation. In our main specifications we use OLS to ease interpretation and because we are interested in sample average estimates. Some dependent variables (eg labor market participation, contraceptive use) are binary, suggesting probit estimation. The marginal probit estimates for labor and contraceptive outcomes offer the same conclusions as OLS estimates do.

9. Discussion

This study's overall discordance levels are in line with previous publications. In a review Allendorf (2007) document average discordance rates from 50 to 75 percent across various previous studies and their own. Further, we document higher self-perceived power by females compared to males' perceptions. Ambler et al. (2017) review the previous literature and find a mixed picture in this regard.

Results are in general agreement with the literature on discordance and health and well-being outcomes (Allendorf, 2007; Ambler et al., 2017). However, analyses of Ambler et al. (2017) propose differences between groups that we classify as *strongly discordant* – groups in which the husband or the wife does not perceive female decision-making power, while the other spouse does. We cannot confirm fundamental differences between these groups (Results are similar for women, who perceive their own power, without their spouses concurring and for those women who do not perceive any female decision-making power while their spouses do). Our observations suggest that future research will benefit from taking into account both spouses' perceptions when assessing female decision-making power. The covert contraceptive use analysis provides new insight on decision-making power and types of contraceptive use. These findings are also supported by previous literature that documented different fertility preferences by men and women (Rasul, 2008a).
The findings on changing perceptions of female economic resources and decision-making power are also closely related to literature that evaluates changes in the perception of female power in general. For example, Beaman et al. (2009) document that exposure to powerful women can shift the perceptions of gender roles of men and women. Future work should elaborate on interventions that shift the perception of either or both sexes.

So far, there is no comprehensive framework for the reasons why partners can be discordant. Supportingly, Ambler et al. (2017) posit that there is no household model that permits the inclusion of diverging spousal preferences. Future work should aspire to develop a theory in order to conceptualize these and related empirical findings.

10. Conclusion

We observe high rates of discordance and find them to be associated with female income shares as well as labor and contraceptive outcomes. We conclude that taking the husband's perspective into account can improve prediction accuracy. We use two different approaches to test the sensitivity of both husbands' and wives' perceptions of female decision-making power to changes in female income shares. Summarizing, the results suggest that at the population level, one-sided surveys provide a good proxy for the reaction of either gender to economic shocks. However, cross-section estimates suggest that females' outcomes will vary in those families where both spouses' reactions correlate vs. those where only one spouse changes its perception of female power.

Female empowerment is one of the central topics in international development, which is reflected in its relevance in policy-making and academia. In international development, many interventions aim at increasing female decision-making power in order to improve the outcomes of women and children. This study suggests that female power is relevant for female outcomes but it also shows that female power is not an objective measure that is independent of subjective evaluation. Rather, it is the interplay of spouses' perceptions that predicts female well-being.

This study motivates a paradigm shift in development economics, moving away from a strong focus on women and taking the husband into the picture to promote female empowerment with the help of both partners.

A. Decision domains and contraception typology

Table 1 presents the list of decision domains. The lead question for every domain listed in the following is "In your household, who makes decisions about:". Individuals can then circle letters representing single household members, such as A for the respondent, B for the spouse, etc.

Table 1: List of single decision domains

Code	Decisions	Considered in analysis	Reason for omission
A1	Expenditure on food eaten at home	Yes	Not applicable
A2	Choice of food eaten at home	No	Considered as indicator for housekeeping role
B	Routine purchases for the household of items such as cleaning supplies	Yes	Not applicable
C	Your clothes	No	Indicator for housekeeping role; unclear interpretation ("choice" vs. "expenditure")
D	Your spouse's clothes	No	
E	Your children's clothes	No	
F	Your children's education	Yes	Not applicable
G	Your children's health	Yes	Not applicable
H	Large expensive purchases for the household (i.e., refrigerator or TV)	Yes	Not applicable
I	Giving money to your parents/family	Yes	Not applicable
J	Giving money to your spouse's parents/family	Yes	Not applicable
K	Gifts for parties/weddings	Yes	Not applicable
L	Money for monthly arisan (savings lottery)	Yes	Not applicable
M	Money for monthly savings	Yes	Not applicable
N	Time the husband spends socializing	Yes	Not applicable
O	Time the wife spends socializing	Yes	Not applicable
P	Whether you/your spouse works?	Yes	Not applicable
Q	Whether you and your spouse use contraception?	Yes	Not applicable

Table 2 presents the typology of statement combinations used in the contraceptive use decision domain. Our main estimates are based on couples of the first three

concordance categories cCM, cCF and cCB and the first three discordance categories cDFM, cDMF and cDOBOF. The grey-colored categories (cNM, cNF, cFN and cMN) are not used in our models since they describe an outcome and decision at the same time.

Table 2: Typology of responses: contraceptive use domain

Code	**Combination of husband's and wife's statement**	
	Concordance	
cCM	Wife and Husb: (m)	Both partners agree on the husband as the sole decision maker
cCF	Wife and Husb: (f)	Both partners agree on the wife as the sole decision maker
cCB	Wife and Husb: (mf)	Both partners agree on joint decision making
cCN	Wife and Husb: (no use)	Both partners agree that they do not use contraceptive methods
	Discordance	
cDFM	Wife: (f) $\vee$ (mf); Husb: (m)	Strong Discordance: wife perceives female decision-making power (individually or jointly), husband does not
cDMF	Husb: (f) $\vee$ (mf); Wife: (m)	Strong Discordance: husband perceives female decision-making power (individually or jointly), wife does not
cDOBOF	One Spouse: (mf); Other Spouse: (f)	Weak Discordance: both spouses perceive female decision-making power, one of them perceives a sole female decision maker, the other joint decision making
cNM	Wife: (no use); Husb: (m)	Wife states that couple does not use contraception, husband perceives male decision making power only
cNF	Wife: (no use); Husb: (f) $\vee$ (mf)	Wife states that couple does not use contraception, Husband perceives female decision making power (individually or jointly)
cFN	Wife: (f) $\vee$ (mf); Husb: (no use)	Wife perceives female decision making power (individually or joint), husband states that couple does not use contraception
cMN	Wife: (m); Husb: (no use)	Wife perceives male decision making power only, husband states that couple does not use contraception

B. Definitions and codings of variables

B.1. Distribution and coding of educational achievement

Table 3: Distribution and coding (see table notes) of educational achievement

	What is the highest educational level attended?	
	Women	Men
Educational level	– in percent of column	– in percent of column
2:Elementary school	36.1	34.9
3:Junior high general	17.4	15.4
4:Junior high vocational	0.5	0.8
5:Senior high general	14.4	15.8
6:Senior high vocational	9.7	12.5
11:Adult education A	0.0	0.1
12:Adult education B	0.3	0.4
13:Open university	0.1	0.1
14:Islamic School (pesantren)	0.2	0.2
15:Adult education C	0.5	1.0
60:College (D1,D2,D3)	3.8	3.1
61:University S1	7.9	9.0
62:University S2	0.4	0.8
63:University S3	0.0	0.1
72:Islamic Elementary School (Madrasah Ibtidaiyah)	1.7	1.3
73:Islamic Junior/High School (Madrasah Tsanawiyah)	4.3	2.4
74:Islamic Senior/High School (Madrasah Tsanawiyah)	2.6	2.0
90:Kindergarten	0.0	
95:Other	0.0	0.0
98:Don't Know		0.0
Observations	8,277	8,419

Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; Categories 2 and 72 are coded as elementary education, categories 3 to 6 and 11 to 15 and 73 and 74 are coded as secondary education, categories 60 to 63 are coded as tertiary education. All remaining categories, for instance, group 90, are grouped in the *no education* category. Individuals who reported that they never received education are not listed in any category but also assigned to the *no education* group of our model.

B.2. Classification of covert methods

There are different approaches to classify covert methods. Ashraf, Field, and Lee (2014) limit their analysis to injectables and test the results to implants and IUDs. Gasca and Becker (2017, p. 7) estimate the rate of indirect, covert use as the share of couples in which women use *"female modern contraceptive methods"* and men reported not a modern method. They consider "female sterilization, contraceptive pill, implant, injectable, IUD, diaphragm/foam/jelly and the female condom" as a modern method. Biddlecom and Fapohunda (1998) report method utilization rates for both women who report open and covert use. For example, injectables are preferred by women who report covert use while only a small share of women who openly use contraceptives report their use. The following table 4 is based on previous studies. The second column presents our reasoning for the classification.

Table 4: Classification of covert methods

Covert methods	**Reasoning**
Injection (1,2,3 months)	Classified as covert method by Gasca and Becker (2017).
IUD (Intrauterin device)/ AKDR/Spiral	Classified as covert method by Gasca and Becker (2017).
Norplant / Implant	Discussed by Gasca and Becker (2017) but not considered in their context due to limited availability of method.
Female Sterilization	Can be used without husband taking notice.
Non-Covert methods	
Pill	It is possible to covertly use the pill. However, Chikovore et al., 2002 and Ashraf, Field, and Lee (2014) describe the difficulties of women to hide them consistently from men. We run a robustness check for an alternative classification.
Condom	Not useable without husband taking notice.
Rhythm / Calendar	Difficult to use without husband taking notice.
Coitus Interruptus	Not useable without husband taking notice.
Male Sterilization	Not useable without husband taking notice.
Methods not considered	
Traditional Herbs	Traditional methods excluded analogous to Gasca and Becker (2017)
Traditional Massage	Traditional methods excluded analogous to Gasca and Becker (2017)
Femidom	Ambiguity of covert/non-covert status leads to exclusion. (However Gasca and Becker (2017) classifies female condoms as female modern contraceptive method.)
Intravag	Ambiguity of covert/non-covert status
Other	Ambiguity of covert/non-covert status

Notes: AKDR = Alat Kontrasepsi Dalam Rahim (Contraception Installation Tool Rahim)

B.3. Definition of the instrumental variable

The instrumental variable approach is based on household exposure to natural disasters and the reactions of households to them. Our knowledge of event experience and reactions is based on responses to two questions in the IFLS-3 (2000) Survey. The first question GE01 asks respondents about the experience of the list of events. It elicits whether the household has experienced a crop loss or a natural disaster. The question and options are listed in table 5. The second question is about how the household reacted to this event. The question and options are listed in table 6. We only consider the events of C crop loss and D natural disaster of table 5 and the options Q, S, T, U, V, W of table 6. We do not include reactions O and P as the inclusion leads to underidentification in some model specifications (see statistics of appendix table E.2).

Table 5: List of possible household shocks

GE01: Has this household gone through [...] in the last 5 years? (Yes/No)	
A	Death of a householder or a family member who is not a householder
B	Sickness of a householder or a family member who is not a householder that necessitated hospitalization or continuous medical treatment
C	Crop loss, reason (Other) [Blank space]
D	Household/business loss due to earthquake, fire or other natural disaster
E	Any of the householders lost a job or failed in business?
F	Decrease of household income, due to decrease of production or very low price of products?
G1	Other, [Blank space]
G2	Other, [Blank space]

Notes: Question and responses taken from the IFLS-3 Survey (2000) supplementary materials; [Blank space]: Space for interviewer to fill text.

Table 6: List of possible household reactions

GE03: What steps have been taken by household members in response to this difficulty?			
A	Eat less food	O	Close/reduce business activities
B	Buy less food	P	Changed business
C	Take child out of school	Q	Changed job/quit job
D	Reduce current spending	R	Take a border into the household
E	Delay plans to spend money	S	Start working for pay
F	Save less money	T	Increase working hours
G	Use savings	U	Take an additional job
H	Sell possessions	V	Expand business activities
I	Borrow money	W	Start a business
J	Move within village	X	Pray
K	Move to new village	Y	Other [Blank space]
L	Receive assistance from friends/family	Z	Nothing
M	Receive assistance from government		
N	Receive assistance from other group		

Notes: Question and responses taken from the IFLS-3 Survey (2000) supplementary materials; [Blank space]: Space for interviewer to fill text.

C. Auxiliary tables

C.1. Differences in attributes of couples that give discordant responses

Table 7: Couple attributes by discordance type in labor market decision domain

	DFM(1) vs. DOBOF (2)			DMF(1) vs DOBOF(2)		
	Mean(1)	Mean(2)	Diff.	Mean(1)	Mean(2)	Diff.
Individual attributes:						
Age	38.58	43.61	-5.03***	39.46	43.61	-4.15***
Sp: age	42.96	48.43	-5.47***	44.27	48.43	-4.16***
Elementary education	0.38	0.40	-0.02	0.40	0.40	0.00
Any secondary education	0.49	0.42	0.07**	0.47	0.42	0.05*
Any college education	0.08	0.11	-0.02	0.08	0.11	-0.03
Sp: Elementary education	0.37	0.43	-0.07**	0.36	0.43	-0.07**
Sp: Any secondary education	0.50	0.44	0.06*	0.48	0.44	0.05
Sp: Any college education	0.10	0.09	0.01	0.13	0.09	0.03
Household attributes:						
N HH adults	2.40	2.47	-0.08	2.39	2.47	-0.09*
N HH children	1.70	1.57	0.13*	1.75	1.57	0.18**
Migration indicator	0.21	0.16	0.05*	0.22	0.16	0.06**
Household economy:						
Log HH income	16.65	16.56	0.09	16.56	16.56	0.00
Any land	0.32	0.33	-0.02	0.34	0.33	0.01
Female income share	0.16	0.36	-0.20***	0.13	0.36	-0.24***
Log h worked pa	6.91	7.17	-0.26***	6.74	7.17	-0.43***
Sp: Log h worked pa	7.41	7.26	0.15**	7.39	7.26	0.13*
Decision share:						
Wife: own decision share	0.79	0.76	0.03**	0.61	0.76	-0.15***
Husb: wife's decision share	0.59	0.78	-0.19***	0.78	0.78	-0.00
Wife: husband's decision share	0.62	0.45	0.16***	0.62	0.45	0.17***
Husb: own decision share	0.65	0.58	0.07***	0.69	0.58	0.11***

Notes: T-Test; **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Decision making domain:** "Whether you/your spouse works"; **Variable definitions:** N HH children: number of children in household; N HH adults: number of adults in household; Migration indicator: household moved since last wave (yes = 1/no = 0); Log HH income: Log of annual income in IDR; Wife:/Husb.: provides wife's/husband's perspective on decision making power respectively; **Typology:** DFM: wife perceives female decision making power, husband does not, DMF: husband perceives female decision making power, wife does not, DOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making; ***/**/* indicate significance of difference at the 1%/5%/10% level.

C.2. Contraception and covert method use estimates

The wife reports the use of contraception and the used method in a separate interview. Table 8 displays the association between responses to the question of who makes decisions about "whether you and your spouse use contraception" and contraceptive use as the dependent variable.

Table 9 displays the association between responses to the question of who makes decisions about "whether you and your spouse use contraception" and covert method use as the dependent variable, conditional on contraceptive use.

Table 8: Estimate of association between statement combinations and contraceptive use

	Dependent variable: Couple uses contraception				
	(1)	(2)	(3)	(4)	(5)
	No controls	Baseline	Baseline with exclusion restriction 1	Baseline with exclusion restriction 2	Baseline with exclusion restrictions 1 and 2
Concordance:					
cCM: Wife and Husb: (m)	-0.226***	-0.234***	-0.145*	-0.233***	-0.112
	(0.041)	(0.045)	(0.075)	(0.048)	(0.074)
cCB: Wife and Husb: (mf)	-0.071***	-0.061***	-0.045***	-0.053***	-0.030***
	(0.018)	(0.018)	(0.015)	(0.017)	(0.010)
Discordance:					
cDFM: Wife: (f) $\vee$ (mf); Husb: (m)	-0.078**	-0.106***	-0.109**	-0.094***	-0.099***
	(0.034)	(0.028)	(0.038)	(0.028)	(0.032)
cDMF: Husb: (f) $\vee$ (mf); Wife: (m)	-0.058**	-0.077***	-0.038	-0.078***	-0.041*
	(0.022)	(0.022)	(0.025)	(0.019)	(0.022)
cDOBOF: One spouse: (f); Other spouse: (mf)	-0.022	-0.029	-0.011	-0.022	0.001
	(0.021)	(0.019)	(0.018)	(0.014)	(0.016)
Constant	0.756***	1.037***	1.198***	1.169***	1.276***
	(0.018)	(0.191)	(0.188)	(0.169)	(0.199)
Region dummies		✓	✓	✓	✓
Control for (spousal) age, HH income and education		✓	✓	✓	✓
Control for N HH adults, N HH children, migration		✓	✓	✓	✓
Observations	5,682	5,167	2,571	4,716	2,475
R^2	0.0075	0.069	0.052	0.076	0.070
Clusters	18	18	18	18	18
Robust standard errors clustered at regional level	Yes	Yes	Yes	Yes	Yes

Note: Standard OLS estimate; **Dependent variable:** contraceptive use; **Baseline group:** concordant couples, perceiving wife as the sole decision maker; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Decision making domain:** "whether you and your spouse use contraception"; Exclusion restriction 1: exclusion of women who respond that they personally want to receive any additional children ("Do you personally wish to have another child?"); Exclusion restriction 2: exclusion of women who state that they do not use contraceptives, due to divorcee/widow status, recent birth (being pre-menstrual or absent from sex) or current breastfeeding; **Typology:** cCM: concordant report of husband as sole decision maker, cCB: concordant report of joint decision making, cDFM: wife perceives female decision making power, husband does not, cDMF: husband perceives female decision making power, wife does not, cDOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making; Robust standard errors in brackets; Robust standard errors in parentheses are clustered at regional level; ***/**/* indicate significance at the 1%/5%/10% level.

Table 9: Estimate of association between statement combinations and covert method use

	Dependent variable: Couple uses covert method conditional on contraceptive use				
	(1)	(2)	(3)	(4)	(5)
	No controls	Baseline	Baseline with exclusion restriction 1	Baseline with exclusion restriction 2	Baseline with exclusion restrictions 1 and 2
Concordance:					
cCM: Wife and Husb: (m)	-0.050	-0.077	-0.147	-0.077	-0.147
	(0.063)	(0.060)	(0.089)	(0.060)	(0.089)
cCB: Wife and Husb: (mf)	0.089***	0.056***	0.029	0.056***	0.029
	(0.027)	(0.014)	(0.019)	(0.014)	(0.019)
Discordance:					
cDFM: Wife: (f) ∨ (mf); Husb: (m)	0.100***	0.088***	0.110***	0.088***	0.110***
	(0.024)	(0.023)	(0.024)	(0.023)	(0.024)
cDMF: Husb: (f) ∨ (mf); Wife: (m)	0.084***	0.052	0.014	0.052	0.014
	(0.028)	(0.030)	(0.049)	(0.030)	(0.049)
cDOBOF: One Spouse: (f); Other Spouse: (mf)	0.051***	0.052***	0.040**	0.052***	0.040**
	(0.016)	(0.016)	(0.019)	(0.016)	(0.019)
Constant	0.685***	1.133***	1.144***	1.133***	1.144***
	(0.023)	(0.140)	(0.190)	(0.140)	(0.190)
Region dummies		✓	✓	✓	✓
Control for (spousal) age, HH income and education		✓	✓	✓	✓
Control for N HH adults, N HH children, migration		✓	✓	✓	✓
Observations	4,016	3,640	2,047	3,640	2,047
R^2	0.0072	0.069	0.071	0.069	0.071
Clusters	18	18	18	18	18
Robust standard errors clustered at regional level	Yes	Yes	Yes	Yes	Yes

Note: Standard OLS estimate; **Dependent variable:** covert contraceptive method use; **Baseline group:** concordant couples, perceiving wife as the sole decision maker; **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Decision making domain:** "whether you and your spouse use contraception"; Exclusion restriction 1: exclusion of women who respond that they personally want to receive any additional children ("Do you personally wish to have another child?"); Exclusion restriction 2: exclusion of women who state that they do not use contraceptives, due to divorce/widow status, recent birth (being premenstrual or absent from sex) or current breastfeeding; **Typology:** cCM: concordant report of husband as sole decision maker, cCB: concordant report of joint decision making, cDFM: wife perceives female decision making power, husband does not, cDMF: husband perceives female decision making power, wife does not, cDOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making; Robust standard errors in brackets; Robust standard errors in parentheses are clustered at regional level; ***/**/* indicate significance at the 1%/5%/10% level.

C.3. Fixed effects analysis: Single domains

Tables 10, 11, 12, 13, 14, 15, and 16 employ a panel model approach with individual fixed effects to survey the relationship of changes in female economic and decision making power over time – from both perspectives, the husband's and the wife's. Female power is surveyed across multiple domains of eight economic household decisions – each table presents two. Economic power is measured as the wife's contribution to household income. Across all tables, the dependent variable is whether the wife or husband agree that the wife has any say in the respective decision domain, irrespective of the spouse's position.

If the wife contributes more to the household income, husbands, as well as wives, tend to attribute more power to the wife over time in the dimensions of expensive purchases and labor market participation. A similar picture of less statistical significance emerges for expenditure for food. As the female income share increases, neither husbands or wives do attribute more decision making power to women with respect to savings and giving money to either of the spouses' families. Women associate higher relative income of themselves with more say over routine purchases and gifts for parties/weddings.

Table 10: Female share of income and female decision making power across domains (1/7)

	Dependent variable: Wife has decision-making power in domain of expenditure for food eaten at home		Dependent variable: Wife has decision-making power in domain of routine purchases for the HH of items such as cleaning supplies	
	(1) Wife says yes	(2) Husband says yes	(3) Wife says yes	(4) Husband says yes
Female income share	0.058**	0.074***	0.048***	0.017
	(0.023)	(0.024)	(0.014)	(0.015)
Constant	0.305	1.302***	0.535***	1.024***
	(0.349)	(0.421)	(0.127)	(0.184)
Control for (spousal) age and HH income	✓	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	14,802	14,802	20,855	20,855
Time dummies and individual fixed effects	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

Table 11: Female share of income and female decision making power across domains (2/7)

	Dependent variable: Wife has decision-making power in domain of children's education		Dependent variable: Wife has decision-making power in domain of children's health	
	(1) Wife says yes	(2) Husband says yes	(3) Wife says yes	(4) Husband says yes
Female income share	0.032*	0.055***	0.004	0.008
	(0.019)	(0.020)	(0.016)	(0.018)
Constant	0.657***	0.331	0.646***	0.495*
	(0.247)	(0.320)	(0.243)	(0.259)
Control for (spousal) age and HH income	✓	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	20,855	20,855	20,851	20,851
Time dummies and individual fixed effects	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

Table 12: Female share of income and female decision making power across domains (3/7)

	Dependent variable: Wife has decision-making power in domain of large expensive purchases (i.e., refrigerator or TV)		Dependent variable: Wife has decision-making power in Domain of Gifts for parties/weddings	
	(1) Wife says yes	(2) Husband says yes	(3) Wife says yes	(4) Husband says yes
Female income share	0.054***	0.048**	0.037***	0.014
	(0.018)	(0.019)	(0.013)	(0.015)
Constant	0.332	0.698***	1.029***	0.884***
	(0.213)	(0.246)	(0.163)	(0.171)
Control for (spousal) age and HH income	✓	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	20,740	20,740	20,851	20,851
Time dummies and individual fixed effects	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

Table 13: Female share of income and female decision making power across domains (4/7)

	Dependent variable: Wife has decision-making power in domain of giving money to wife's family		Dependent variable: Wife has decision-making power in domain of giving money to husband's family	
	(1) Wife says yes	(2) Husband says yes	(3) Wife says yes	(4) Husband says yes
Female income share	0.013	-0.017	0.006	-0.018
	(0.018)	(0.018)	(0.018)	(0.020)
Constant	0.939***	0.979***	0.761***	0.727***
	(0.223)	(0.241)	(0.275)	(0.232)
Control for (spousal) age and HH income	✓	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	20,850	20,850	20,851	20,851
Time dummies and individual fixed effects	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

Table 14: Female share of income and female decision making power across domains (5/7)

	Dependent variable: Wife has decision-making power in domain of money for monthly Arisan (lottery)		Dependent variable: Wife has decision-making power in domain of monthly savings	
	(1) Wife says yes	(2) Husband says yes	(3) Wife says yes	(4) Husband says yes
Female income share	0.052**	0.028	0.036	0.025
	(0.022)	(0.023)	(0.023)	(0.024)
Constant	-0.149	-0.093	-0.295	-0.578**
	(0.299)	(0.287)	(0.275)	(0.276)
Control for (spousal) age and HH income	✓	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	20,855	20,855	20,855	20,855
Time dummies and individual fixed effects	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

Table 15: Female share of income and female decision making power across domains (6/7)

	Dependent variable: Wife has decision-making power in domain of time husband spends socializing		Dependent variable: Wife has decision-making power in domain of time wife spends socializing	
	(1) Wife says yes	(2) Husband says yes	(3) Wife says yes	(4) Husband says yes
Female income share	-0.013	0.075***	-0.014	0.010
	(0.025)	(0.024)	(0.014)	(0.016)
Constant	0.330	0.503	0.820***	0.861***
	(0.291)	(0.347)	(0.157)	(0.179)
Control for (spousal) age and HH income	✓	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	20,855	20,855	20,855	20,855
Time dummies and individual fixed effects	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

Table 16: Female share of income and female decision making power across domains (7/7)

	Dependent variable: Wife has decision-making power in domain of labor market decision-making		Dependent variable: Wife has decision-making power in domain of contraception use	
	(1) Wife says yes	(2) Husband says yes	(3) Wife says yes	(4) Husband says yes
Female income share	0.291***	0.334***	0.017	-0.027
	(0.019)	(0.021)	(0.020)	(0.021)
Constant	0.002	0.351	1.078***	0.517**
	(0.258)	(0.250)	(0.262)	(0.253)
Control for (spousal) age and HH income	✓	✓	✓	✓
Control for N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	20,855	20,855	20,847	20,847
Time dummies and individual fixed effects	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

C.4. Fixed effects analysis: overall decision share

Table 17: Female share of income and perceived female decision making power across all domains

	(1) Wife's perspective	(2) Husband's perspective
Female income share	0.045***	0.048***
	(0.008)	(0.009)
Log HH income	0.015***	0.013***
	(0.002)	(0.003)
Constant	0.463***	0.516***
	(0.098)	(0.119)
Control for (spousal) age and HH income	✓	✓
Control for N HH adults, N HH children	✓	✓
Observations	20,855	20,855
Year, Regional FE	Yes	Yes
Robust SEs	Yes	Yes

Notes: Fixed effects estimate; **Dependent variable:** female overall decision share; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple; Definition: Overall female/male decision making share: Number of decisions with female/male involvement divided by number of overall decisions; Robust standard errors in brackets; ***/**/* indicate significance at the 1%/5%/10% level.

C.5. Instrumental variable first stage estimates

Table 18: Instrumental variable first stage estimate: effects of labor supply shocks on female income share

	Dependent variable: Female income share			
	(1) Land-owners only		(2) Full sample	
CL: Start working for pay	-0.063***	(0.023)	-0.040	(0.024)
CL: Changed job/quit job	0.171	(0.121)	0.145*	(0.074)
CL: Increased working hours	0.015	(0.033)	0.014	(0.031)
CL: Take an additional job	-0.050*	(0.030)	-0.044*	(0.024)
CL: Expand business acitvities	-0.057**	(0.025)	-0.057**	(0.023)
CL: Start a business	0.023	(0.032)	0.037	(0.029)
ND: Start working for pay	-0.039	(0.087)	0.063	(0.090)
ND: Changed job/quit job	0.164***	(0.020)	0.155***	(0.015)
ND: Increased working hours	0.031	(0.145)	-0.124	(0.099)
ND: Take an additional job	-0.120***	(0.027)	-0.071**	(0.030)
ND: Expand business acitvities	0.000	(.)	0.000	(.)
ND: Start a business	0.000	(.)	0.000	(.)
Any land			-0.046***	(0.008)
Constant	-0.351***	(0.086)	-0.369***	(0.059)
Control for (spousal) age and education	✓		✓	
Control for HH income, N HH adults, N HH children	✓		✓	
Observations	2,276		6,053	
Regional dummies	Yes		Yes	
Robust standard errors	Yes		Yes	

Note: Instrumental variable first stage estimate; **Data:** IFLS-3 wave (2000), cross-sectional data, one observation is one couple; Independent variables express changes in labor supply due to either ND: natural disaster or CL: crop loss; Estimates do not vary between husband's perspective and wife's perspective as only wife's income and not decision share is estimated in first stage; Robust standard errors in brackets are clustered at regional level; ***/**/* indicate significance at the 1%/5%/10% level.

D. Descriptive statistics

D.1. Contraception

Table 19: Frequency of use of contraceptive methods over time

	Which birth control device/method do you/does your husband use now?			
	2000	2007	2014	Full Sample
Contraceptive method	in percent of column	in percent of column	in percent of column	in percent of column
Pill	24.1	23.2	20.9	22.6
1_Month_Injection	1.7	5.7	8.1	5.5
2_Month_Injection	0.3	0.5	0.5	0.4
3_Month_Injection	35.5	47.1	45.8	43.5
Intravag	0.1	0.1		0.1
Condom	1.7	1.8	2.9	2.2
IUD/AKDR/Spiral	15.0	8.1	8.1	10.0
Norplant/Implant	8.7	4.0	5.9	6.0
Female_Sterilization/Tubectomy	8.6	5.0	5.2	6.1
Male_Sterilization	0.5	0.3	0.3	0.4
Rhythm/calendar	2.1	2.6	1.4	2.0
Coitus_Interruptus	0.3	1.0	0.3	0.6
Traditional_Herbs	1.1	0.4	0.1	0.5
Traditional_Massage	0.1	0.1		0.1
Other		0.1	0.3	0.2
Observations	3,094	4,017	4,228	11,339

Notes: Three residual categories merged into other section; One couple is one observation; The rate of covert contraceptive use is calculated as the number of women who use contraceptive methods divided by all women who use contraceptives.

Table 20: Contraception domain: contraceptive use and covert method use by response type

	Frequencies of responses by couple if wife reports in seperate interview...				Full sample
	(1)	(2)	(3)	(4)	(5)
	... no use	... use	... no covert method	... covert method	Full sample
	– in percent of column	– in percent of column	– in percent of column	– in percent of column	– in percent of column
Concordance:					
cCM: Wife and Husb: (m)	0.02	0.01	0.02	0.01	0.02
cCF: Wife and Husb: (f)	0.10	0.19	0.23	0.18	0.15
cCB: Wife and Husb: (mf)	0.22	0.29	0.26	0.31	0.25
cCN: Wife and Husb: (no use)	0.16	0.00	0.01	0.00	0.09
Sum concordance	0.49	0.50	0.51	0.50	0.50
Discordance:					
cDFM: Wife: (f) $\vee$ (mf); Husb:(m)	0.06	0.08	0.07	0.09	0.07
cDMF: Husb: (f) $\vee$ (mf); Wife:(m)	0.05	0.08	0.07	0.08	0.06
cDOBOF: One Spouse: (f); Other Spouse: (mf)	0.17	0.29	0.30	0.29	0.23
cNM: Wife: (no use); Husb: (m)	0.02	0.00	0.00	0.00	0.01
cNF: Wife: (no use); Husb: (f) $\vee$ (mf)	0.11	0.01	0.01	0.01	0.06
cFN: Wife: (f) $\vee$ (mf); Husb: (no use)	0.08	0.03	0.03	0.03	0.06
cFM: Wife: (m); Husb: (no use)	0.01	0.00	0.00	0.00	0.01
Sum discordance	0.51	0.50	0.49	0.50	0.50
Observations	2,665	4,228	1,096	3,113	8,662

Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Decision making domain:** "whether you and your spouse use contraception"; **Typology:** cCM: concordant report of husband as sole decision maker, cCB: concordant report of joint decision making, cDFM: wife perceives female decision making power, husband does not, cDMF: husband perceives female decision making power, wife does not, cDOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making.

D.2. Instrumental variable approach: geographical distribution of shocks

Table 21: Distribution of instrument events across provinces

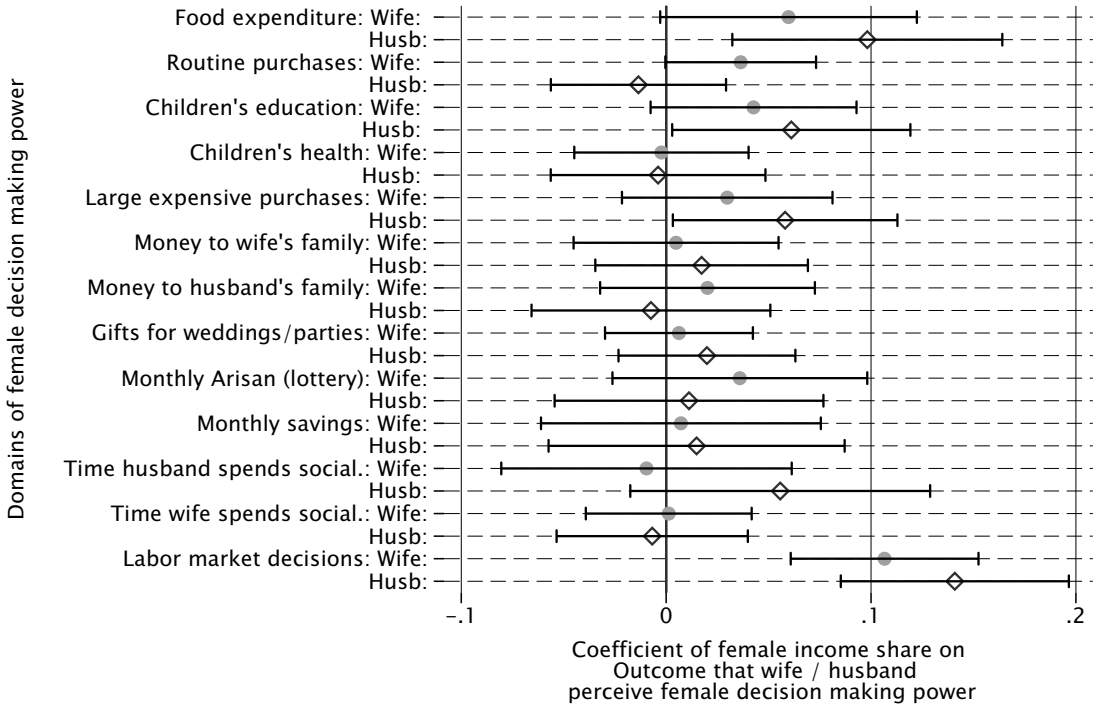
	Household loss due to earthquake fire, or other natural disaster		Crop loss	
	Loss	No Loss	Crop loss	No crop loss
Province	– in percent of column	– in percent of column	– in percent of column	– in percent of column
North_Sumartra	8.4	6.0	6.8	5.9
West_Sumatra	5.6	4.5	3.2	4.7
Riau	0.9	0.3		0.3
South_Sumartra	8.4	4.9	4.3	5.0
Lampung	0.9	4.5	12.1	3.3
Jakarta	10.3	7.4	0.5	8.5
West_Java	19.6	18.0	17.3	18.1
Central_Java	10.3	12.9	15.5	12.5
Yogyakarta	1.9	5.9	5.7	5.8
East_Java	15.0	14.2	8.4	15.0
Bali	3.7	5.6	3.2	5.9
West_Nusa_Tenggara	1.9	6.6	6.6	6.6
South_Kalimantan	7.5	4.6	11.8	3.6
South_Sulawesi	5.6	4.6	4.6	4.6
Central_Kalimantan		0.0		0.1
Observations	107	6,424	808	5,723

Notes: ***Data:*** *IFLS-3 wave (2000), cross-sectional data, one observation is one couple.*

E. Robustness checks

E.1. Alternative specification: household income share

Table 22: Fixed effects model: alternative coding of household income share



Note: Alternative household share calculation; Fixed effects estimate; **Data:** IFLS waves 3, 4 and 5, panel data 2000 to 2014, one observation is one couple, **Dependent variable:** wife (husband) states that wife has decision making power in specific domain; Ticks indicate 95 percent confidence interval.

Table 23: IV model: alternative coding of household income share

	Dependent variable: female decision-making share from ...			
	(1) ...Wife's perspective (Land-owners only)	(2) ...Husband's perspective (Land-owners only)	(3) ...Wife's perspective (Full sample)	(4) ...Husband's perspective (Full sample)
Female income share	0.481**	0.482**	0.538**	0.574**
	(0.206)	(0.202)	(0.242)	(0.238)
Any land			0.049**	0.061***
			(0.023)	(0.023)
Constant	0.687***	0.771***	0.555***	0.645***
	(0.151)	(0.154)	(0.121)	(0.125)
Control for (spousal) age and education	✓	✓	✓	✓
Control for income, N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	1,499	1,499	3,377	3,377
Underid. F-Statistic	15.7	15.7	17.0	17.0
(p-Value)	0.110	0.110	0.0755	0.0755
Weak id. F-Statistic	9.578	9.578	25.26	25.26
Region dummies	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Instrumental variable reduced results; **Dependent variable:** female share in household decision making across all decision domains; **Data:** IFLS-3 wave (2000), cross-sectional data, one observation is one couple; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes

E.2. Alternative specification: instrumental variable coding

Table 24 repeats the instrumental variable estimation with an alternative instrument coding. Before, we coded an indicator variable vector reflecting all possible six reactions [Q, S, T, U, V, W] of table 6 to the two events (crop loss and natural disasters). We now include an extended list of reactions, namely [O, P, Q, S, T, U, V, W]. Keeping our two possible events, this results in a vector of 16 indicator variables. This instrument is not valid as suggested by the underidentification and overidentification statistics provided in table 24.

Table 24: IV model: reduced form results with alternative set of instruments

	Dependent variable: female decision-making share from ...			
	(1) ...Wife's perspective (Land-owners only)	(2) ...Husband's perspective (Land-owners only)	(3) ...Wife's perspective (Full sample)	(4) ...Husband's perspective (Full sample)
Female income share	0.457**	0.492***	0.510**	0.437**
	(0.189)	(0.179)	(0.199)	(0.184)
Any land			0.033***	0.034***
			(0.011)	(0.010)
Constant	0.523***	0.632***	0.457***	0.505***
	(0.096)	(0.098)	(0.086)	(0.083)
Control for (spousal) age and education	✓	✓	✓	✓
Control for HH income, N HH adults, N HH children, migration	✓	✓	✓	✓
Observations	2,276	2,276	6,053	6,053
Underid. F-Statistic	22.9	22.9	20.3	20.3
Underid. P-val.	0.0431	0.0431	0.0878	0.0878
Weak id. F-Statistic	16.81	16.81	11.31	11.31
Overid. F-Statistic	9.795	15.87	10.60	26.72
Region dummies	Yes	Yes	Yes	Yes
Robust standard errors	Yes	Yes	Yes	Yes

Notes: Reduced form IV results; **Dependent variable:** female share in household decision making across all decision domains; Individual level attributes are wife's attributes by default, Spouse (Sp:) refers to husband's attributes; alternative coding of instrument; **Data:** IFLS-3 wave (2000), cross-sectional data, one observation is one couple; ***/**/* indicate significance at the 1%/5%/10% level.

F. Cross tabulation of labor supply and contraceptive use domains

Table 25: Cross tabulation of labor supply and contraceptive use domains

	Labor supply *Concordance* in percent of column			Labor supply *Discordance* in percent of column			Full sample
Contraceptive use	CM	CF	CB	DFM	DMF	DOBOF	
Concordance:							
cCM	5.3		0.7	1.4	1.7		2.0
cCF	26.2	65.0	12.3	19.0	18.4	27.3	19.0
cCB	17.4	8.3	49.3	25.3	27.7	21.7	32.1
Discordance:							
cDFM	13.1	5.0	3.8	17.8	3.6	5.3	9.2
cDMF	13.1		4.5	5.6	16.0	11.0	8.4
cDOBOF	24.9	21.7	29.4	31.0	32.6	34.8	29.3
Observations	1,492	60	2,415	1,560	776	374	6,688

Notes: **Data:** IFLS-5 wave (2014), cross-sectional data, one observation is one couple; **Typology:** CM: concordant report of husband as sole decision maker, CF: concordant report of wife as sole decision maker, CB: concordant report of joint decision making; CN: concordant report of neither partner as decision maker, DFM: wife perceives female decision making power, husband does not, DMF: husband perceives female decision making power, wife does not, DOBOF: both spouses perceive female decision making power, one of them perceives a sole female decision maker, the other joint decision making, DONOM: one of the spouses perceives that neither spouse makes the decision, the other spouse perceives male decision maker; One observation is one couple.

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