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Female autonomy in household decision-making and intimate partner violence: Evidence from Pakistan

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Abstract

The aim of this study is to explore the links between female autonomy in household decision-making and intimate partner violence in a highly relevant yet under-studied context: Pakistan. Using a nationally representative dataset, and employing matching and partial identification estimation approaches, we show that an increase in female autonomy in household decision-making is associated with a decrease in the probability of experiencing intimate partner violence. Moreover, female autonomy is also associated with lower tolerance for intimate partner violence. Our results call for a greater focus on female autonomy in policy efforts concerned with reducing intimate partner violence.

Keywords: female autonomy, household decision-making, intimate partner violence, Pakistan.

JEL codes: J12, D10, O12.

1. Introduction

Goal Five of the United Nations' Sustainable Development Goals (SDGs) seeks to improve gender equality and empower women (UN 2018). However, across large parts of the developing world, violence against women is endemic, and has strong adverse consequences on a range of health and pregnancy-related outcomes, maternal morbidity, mental health and suicide (Beleche 2019; Campbell 2002; Krantz and Garcia-Moreno 2005). According to a World Health Organization (WHO) multi-country study, an estimated one in three females have experienced some form of physical or sexual violence by an intimate partner (WHO 2017). Intimate partner violence (IPV) is common in South Asia, and recent regional estimates from the WHO suggest that South Asia has the highest regional rate of IPV in the world, at 43 per cent (García-Moreno et al. 2013). According to a study by Fulu et al. (2013), 46 per cent of married men in northern India, and more than one in three men from a study in Bangladesh reported perpetration of physical violence, sexual violence, or both against their wives in the past 12 months. A recent Lancet series has further highlighted the extent of the problem (Ellsberg et al. 2015; Michau et al. 2015), but these studies have pointed out that the bulk of the studies come from high-income settings. Michau et al. (2015) have identified patriarchal social norms, as being a key driver for gender based violence, and Ellsberg et al. (2015) emphasise the need for greater research on domestic violence.

The aim of this paper is to advance the knowledge on the factors influencing IPV particularly focusing on the role of female autonomy.[1] Previous empirical research has established links between female autonomy and IPV through several channels. They include the effects of female paid employment (Eswaran and Malhotra 2011; Heath 2014), intra-household gender wage gaps (Aizer 2010; Henke and Hsu 2020), cash transfers targeted to women (Bobonis et al. 2013; Hidrobo and Fernald 2013;

[1] Although domestic violence can be experienced by males and among the same-sex couples, globally the bulk of domestic violence appears to be directed at females (Vanderende et al. 2012; WHO 2012). Therefore, the focus of our paper is on domestic violence directed at females, particularly IPV.

Hidrobo et al. 2016), marital transfers (Menon 2020) and changes in formal and informal institutions on female autonomy (Amaral 2017; Jayachandran 2015). The idea is that in societies where gender inequalities are pervasive, women are more vulnerable to IPV. Therefore, an improvement in female economic empowerment is expected to improve a woman's intra-household bargaining power, thereby reducing her risk of IPV.

However, the link between female autonomy and an experience of IPV is not clear-cut in developing countries. In some studies such as those from Turkey (Yilmaz 2018), Bangladesh (Fakir et al. 2016; Schuler and Nazneen 2018) and India (Jejeebhoy and Cook 1997; Sethuraman et al. 2006) there is indeed evidence that greater female autonomy is associated with a decrease in IPV. However, others, such as Eswaran and Malhotra (2011) and Heath (2014), for example, find that greater female access to economic resources has the perverse effect of increasing IPV, as men seek to assert their authority in traditional patriarchal societies, such as India and Bangladesh, respectively. Thus, the link between female autonomy and IPV is highly context-specific.

We study how female autonomy is related to IPV in Pakistan using data from the nationally representative *Pakistan Demographic Health Survey* (PDHS) conducted in 2012-13 and 2017-18. Pakistan is a particularly relevant context to study these issues because it is a traditional, patriarchal society (Hamid et al. 2010; Niaz 2004), and almost one in three married females report having experienced some form of physical violence. By providing evidence from an under-explored context and focusing on a particular form of female autonomy, this paper makes progress towards understanding the role of female autonomy in IPV.

To better understand the link between female autonomy and the risk of IPV, it is critical that we agree on a definition of autonomy. The term 'female autonomy' is a multi-faceted concept that is difficult to conceptualise as it encompasses several dimensions. It is further complicated by the fact that the terms 'female autonomy' and 'female agency' are used interchangeably. Female autonomy has typically been measured using variables such as access to economic resources, autonomy in decision-

making, physical mobility and schooling. However, there is variability in exactly which aspects of female autonomy may affect the risk of violence in different contexts. This ambiguity in the literature underscores the need to study the links between female autonomy and exposure to IPV, and more importantly identify precisely which aspects of female autonomy are likely to reduce the risk of IPV in a particular context. Given that our focus is on Pakistan, a country with low levels of female labour force participation, we define female autonomy as the ability of married females to influence decisions about themselves or close household members, their ability to control economic resources and information, and their ability to move freely (Basu 1992; Bloom et al. 2001; Dyson and Moore 1983; Jejeebhoy 2002; Mason 1984).

Econometrically, in identifying the links between female autonomy and experience of IPV, there is potential for endogeneity of female autonomy – an issue that has often put constraints on making causal inferences in existing studies. Such endogeneity concerns can arise since females with different degrees of autonomy may differ from each other in unobserved ways; and these unobserved differences may in turn be related to their experience of IPV. A conventional approach to deal with such endogeneity concerns is to exploit an instrumental variable or a natural experiment for identification. However, we do not have a persuasive instrumental variable in our dataset. Instead, we take the approach of mitigating the concerns around endogeneity by using two alternative approaches. First, we employ a matching approach to account for differences in females' observable characteristics and the likelihood of possessing autonomy in household decision-making. Second, we use a partial identification approach proposed by Oster (2019) to quantify how large would the amount of selection on unobservables need to be relative to the amount of selection on observables, to explain away the entire causal effect of female autonomy in household decision-making on IPV.

Our analysis establishes a negative link between female autonomy in household-decision making and IPV in Pakistan. Estimation results from a baseline model employing a matching approach suggest that relative to a female with no autonomy, having full autonomy in household decision-making is

associated with a 4.7 percentage point decrease in the probability of a female experiencing IPV. Using a partial identification approach, we further demonstrate that the influence of unobserved heterogeneity would need to be exceedingly large for the entire causal effect of female autonomy to disappear. Not only is female autonomy in household decision-making associated with lower probability of experiencing IPV, it also appears to have implications for the degree of tolerance for IPV.

In the next section, we discuss previous research on the nexus between female autonomy and IPV.

2. Background

2.1. Female autonomy, control over economic resources and IPV

In the economics empirical literature discussed below, economic empowerment is often measured using paid employment, reduction in intra-household gender wage gaps and access to cash transfers. However, there is ambiguity in the empirical literature on the links between female autonomy and experience of IPV, which differs by context and by sub-groups of the population.[2] The theoretical literature has attributed this ambiguity to two different factors. According to the theory of expressive violence, abusers enjoy and pay for violence against their victims, and an increase in the victim's bargaining power is expected to reduce IPV. On the other hand, the theory of instrumental violence posits that an improvement in female bargaining power may increase their risk of IPV, since abusers use violence as a mechanism to control their spouses. These theories have different implications for

[2] This ambiguity is also found in non-economics studies, such as the study by Peek-Asa et al. (2011), who report that domestic violence rates are higher in southern India relative to the northern states, despite evidence of south Indian females having greater decision-making autonomy. Similar findings are reported in several other studies (Atkinson et al. 2005; Choi and Ting 2008; Jewkes et al. 2002; Schuler and Nazneen 2018; Schuler et al. 1998).

the influence of female autonomy on risk of IPV, and which theories dominate is an empirical question. Below we discuss the main economic channels influencing female autonomy and its influence on IPV.

A first strand of literature has examined the link between female employment and IPV. Empirical studies by Eswaran and Malhotra (2011) from India, and Heath (2014) from Bangladesh both find that female employment (which is often used as proxy for female economic autonomy) is associated with greater prevalence of IPV. In accordance with the theory of instrumental violence, this surprising finding may be due to the possibility, that in patriarchal societies, males may resort to IPV as a means of asserting their authority (for similar evidence in other contexts see also Cools and Kotsadam (2017) and Erten and Keskin (2019)). In particular, Heath (2014) finds a positive correlation between female employment and IPV in Bangladesh, but only among less educated women or those who were married at a young age. She uses education and age at marriage as two predetermined measures of bargaining power and argues that women whose predetermined bargaining power is sufficiently high do not face the increase in violence associated with work opportunities. The study by Eswaran and Malhotra (2011) finds that working women, especially those working away from home face greater IPV in India using the 1998-99 wave of the Indian dataset National Family Health Survey.[3] However, using the same 1998-99 dataset from India, and an identification strategy that exploits regional differences in short-term rainfall shocks on rural labour demand, Chin (2012) finds the opposite effect, i.e. employed women are at a lower risk of experiencing IPV.

A second strand of literature has examined the role played by relative wages on female household bargaining power and IPV. A US study by Henke and Hsu (2020) shows that increase in a woman's relative potential wage decreases her risk of IPV (see also Aizer (2010) for earlier evidence) – a

[3] The study additionally examines the relationship going from female decision-making autonomy to IPV. The authors hypothesise that the husband is more likely to resort to violence if he can physically overpower his wife, and accordingly use the index of woman's height as an instrument for IPV to study its effect on female autonomy. However, the exclusion restriction in this instrumental variable estimation hinges upon the strong assumption that the relationship between woman's height and autonomy is entirely mediated by IPV. The results of their OLS regression of female autonomy on IPV are statistically insignificant.

finding that is consistent with the theory of expressive violence. However, Vietnam-based evidence by Bulte and Lensink (2019) shows that women who participate in a professional training program which increases their potential income, in fact suffer more frequent IPV, consistent with the instrumental theory of violence.

A third strand of literature has examined the links between exogenous changes in women's control over economic resources (via cash transfers), its influence on intra-household bargaining power and ultimately IPV. A large literature has found cash transfers to be effective in reducing domestic violence. This provides further evidence on how the incidence of IPV responds to relative income changes within the household (Angelucci 2018; Bobonis et al. 2013; Haushofer et al. 2019; Heath et al. 2020; Hidrobo and Fernald 2013; Hidrobo et al. 2016). These studies have found that cash transfers reduce IPV, through increasing intra-household female bargaining power. However, a number of studies report increases in IPV for some subgroups. In particular, Haushofer (2019), Heath (2020), Hidrobo and Fernald (2013) examine the influence of randomised roll-out of cash transfers, in Kenya, Mali and Ecuador, respectively, on IPV, both physical and emotional. Notably, the impacts of cash transfers on the risk of IPV are conditional on the level of female education, and household structure (polygamous vs monogamous marriages) in Heath's (2020) study from Mali. Hidrobo and Fernald (2013), on the other hand, find that cash transfers significantly *increase* emotional violence in households where the woman's education is equal to or more than her partner's in Ecuador.

2.2. Changes in markets and institutions and their influence on IPV

Another group of papers has examined how an exogenous change in women's economic circumstances can influence their intra-household bargaining power and their risk of IPV. Amaral (2017) studies the links between property rights (through changes in succession laws, specifically differential implementation of the Hindu succession act across different states in India) and violence against women. She finds that changes in inheritance laws favouring women, brought about a reduction in

violence against women in India, including in IPV. However, in an earlier paper in the same Indian context, Anderson and Genicot (2015) show that increased property rights for women in fact increased the incidence of IPV and suicide among both men and women through increasing the conflict within the household.

More recently, Menon (2020) used data from the Indian National Family Health Survey (NFHS) and exogenous changes in gold prices as a proxy for marital endowment, to examine whether it influenced women's bargaining power and ultimately affected her probability of experiencing IPV. Given that gold jewellery is an important form of women's marital economic endowment, she finds that an increase in the price of gold (i.e. lower dowry endowment) is associated with an increase in IPV.

In a comprehensive analysis of the sources of various manifestations of gender inequality, including gender-based violence, Jayachandran (2015) discusses the role played by under-development (see also Duflo (2012)). However, she also highlights the significance of informal institutions and norms in contributing to the general favoritism towards males in a society. Social change, such as that caused by the Egyptian Arab Spring, has the power to change such norms according to Bargain et al. (2019) who show a decline in the acceptance of domestic violence and girls' circumcision in the regions most affected by the protests. Yet, in the cases of other major historical events such as the Rwandan genocide, we see reduced household decision-making power for women and an increase in the probability of experiencing IPV (La Mattina 2017).

Summing up, the above economics literature provides potential channels through which women's control over economic resources can improve their household decision-making, and in turn reduce their risk of IPV. However, in the context of a patriarchal society such as Pakistan, where female labour force participation is low, social norms and other non-economic factors may play a relatively larger role in influencing women's risk of IPV. Below we review previous research on IPV in Pakistan.

2.3. Studies on IPV in Pakistan

Studies from Pakistan have shown that mothers' lifetime experience of IPV is associated with an array of adverse mental and reproductive health outcomes (Zakar et al. 2016), and reduced health-seeking behaviors (Ferdous et al. 2017). Furthermore, in traditional settings females are conditioned from a young age to be subservient and to accept the dominant role of male relatives (see Rahman et al. (2011) and Fakir et al. (2016)). In Pakistan this is particularly true for vulnerable groups such as females in rural areas and those from lower socio-economic backgrounds (Aftab and Khan 2011), given their lack of outside options. An acceptance of domestic violence is common even among teenage Pakistani girls, and according to a recent UN report, 53 per cent of teenage girls in Pakistan believe that domestic violence is justified, and more than 30 per cent of girls aged 15-19 had experienced physical or sexual violence in the country (UNFPA 2015). These findings highlight the need to get a better understanding of the factors putting females at risk of IPV in Pakistan.

Ali et al. 's (2015) systematic review of violence against females in Pakistan provides an excellent overview of previous research on IPV. Using data from the Aurat Foundation (2013) they find that during 2012, a total of 7,516 cases of violence against females were reported across Pakistan. Among the studies examined, they find that the risk of experiencing physical IPV at least once, ranged from 16 per cent to 80 per cent (Andersson et al. 2010; Farid et al. 2008; Fikree et al. 2006; Niaz 2004). Small sample studies from Pakistan, such as Zakar et al.'s (2016) study of 490 rural Pakistani females, find high levels of reported IPV, with 65% of the females in their sample experiencing some form of domestic violence. However, a key shortcoming of the current literature on IPV from Pakistan is that a majority of these studies are from hospital settings and refer to a specific sub-sample of the population, e.g. pregnant women, new mothers or women admitted to hospitals for treatments for violent incidence representing the particularly severe cases. As such, these are not representative of the general population, and only capture severe incidents of IPV, and not necessarily an on-going pattern of IPV within the wider community.

One important exception that doesn't suffer from such representativeness-related limitations is the study by Jacoby and Mansuri (2010) which focuses on the practice of *watta satta* (which involves the simultaneous marriage of a brother-sister pair from two households), and shows how it can prevent inefficient marital outcomes, including domestic violence, in the context of rural Pakistan. The underlying mechanism is the mutual threat of reciprocity under *watta satta*. Furthermore, another nationally representative study by Khalil and Mookerjee (2019) shows that patrilocality (a system of postmarital residence where the married couple resides with the husband's extended family) acts as a deterrent on IPV among women married into such households in South Asian countries, including Pakistan. Our study compliments those of Jacoby and Mansuri (2010) and Khalil and Mookerjee (2019) by pointing to a related but distinct role of female autonomy in household decision-making in deterring IPV.

3. Empirical strategy

3.1. Data and descriptive statistics

The analyses in this paper use pooled cross-sectional data from the Pakistan Demographic and Health Survey (PDHS) 2012-13 and 2017-18 conducted by the National Institute of Population Studies (NIPS) with technical support from ICF International and the Pakistan Bureau of Statistics (PBS), and financial support from the United States Agency for International Development (USAID). The PDHS 2012-13 and 2017-18 represent the third and the fourth waves of the Demographic Health Survey conducted in Pakistan. These are the only two waves, however, which included a special domestic violence module alongside information on autonomy in the domestic sphere and standard individual- and household-level variables.

The PDHS interviewed ever-married females between the ages of 15 to 49 years (13,558 in 2012-13 and 15,068 in 2017-18). Due to ethics requirements, information on domestic violence was collected

from just one randomly selected female per household who was married at the time of the survey. As a result, the domestic violence module was implemented in a sub-sample of 3,687 females in 2012-13 and 4,085 females in 2017-18. We further restricted the sample to females who had experienced one marital union in their lifetime (3,594 females in 2012-13 and 3,991 females in 2017-18) since information on the start date of the current partnership could not be determined for females who had experienced more than one union. We excluded a small number (up to 20) of observations due to missing information on IPV, our main variable of interest. After additionally dropping the observations with missing data on key predictor variables, the final sample comprises 5,898 observations including 2,594 individuals observed in 2012-13 and 3,304 individuals observed in 2017-18.[4]

Our main dependent variables are measures of IPV. In the PDHS information was obtained from ever-married females aged 15-49 years on violence committed by their current and former spouses, and by others. These detailed measurements were made using a shortened and modified version of the Conflict Tactics Scale (Straus 1990). Specifically, we measure spousal physical violence for currently married females based on responses to the following set of questions: Did your husband: (a) push you, shake you or throw something at you, (b) slap you, (c) punch you with his fist or hit you with something harmful, (d) kick or drag you, (e) try to strangle or burn you, (f) threaten or attack you with knife/gun or other weapon, and (g) twist your arm or pull your hair?

Using responses to the above questions, we define our baseline measure of IPV as a binary variable that takes on a value of 1 if the female respondent reported having experienced physical violence committed by her partner in the 12 months prior to the survey, 0 otherwise. As Table 1 demonstrates, there is a decline in the incidence of IPV between the two surveys for most of the measures of physical violence. Twenty per cent of the respondents in the sample report experiencing such violence in 2012-

[4] While a relatively large number of observations on measures of female decision-making autonomy are missing, we have verified that this non-response item is not correlated with the outcome variable in the analysis.

13; however by 2017-18 this share had gone down to 15.7 per cent. Some forms of violence are more common than others. For example, 17.1 per cent of the 2012-13 sample and 13.5 per cent of the 2017-18 sample report being slapped by their husband. Furthermore, 11.6 per cent of the female respondents in 2012-13 and 10.3 per cent of the females in the sample in 2017-18 were pushed, shaken or had something thrown at them. On the other hand, more severe forms of physical violence, such as being strangled or burnt by husband, or being threatened with a knife/gun or some other weapon, are far less common albeit not entirely absent.[5] Overall, the average number of incidences of physical violence experienced by a female in our sample is 0.458 in 2012-13 and 0.397 in 2017-18, ranging from 0 (no physical violence) to 7 violent incidences.

----Table 1----

Our key explanatory variables are measures of female autonomy. We measure female autonomy in the domestic sphere across three dimensions: autonomy in household decision-making, economic autonomy and physical mobility, from the following questions asked of the female respondents. Do you have a say over: (i) large household purchases, (ii) the way in which money earned by your husband is used, (iii) visits to families or relatives, and (iv) your own health care? Based on responses to these four questions we construct a binary variable for each question that takes on a value of 1 if the respondent reports being involved in decision-making, 0 otherwise. We use a more consensual definition of autonomy as many of these decisions involve other household members, and it may be difficult to regard a jointly determined solution as being less desirable than a solely determined one. As Table 1 shows, while IPV appears to have declined between 2012-13 and 2017-18, female decision-making autonomy has worsened in each of the four domains of decision-making. Less than half of the females in our sample were involved in making decisions in all four domains, based on this measure, and female involvement in decision-making has gone down in the period from 2012-

[5] This can in some part be explained by sample selection; e.g. the practice of bride burning is unlikely to be recorded in the survey since the woman is unlikely to have survived this particular form of IPV.

13 to 2017-18. Only 43.1 per cent of females in the 2012-13 sample and 37 per cent of females in the 2017-18 sample were involved in household decision-making in all four domains. With regards to specific household decision-making variables, under 60 per cent of females in the 2012-13 sample and 55.8 per cent of females in the 2017-18 sample were involved in decisions on their own health care. Over 63 per cent of females in 2012-13 and 55.4 per cent of females in 2017-18 report involvement in decision-making on visits to family or relatives. Furthermore, around 58 per cent of the females in our 2012-13 sample had a say in decisions on making large household purchases and 55.6 per cent - on the ways in which money earned by the husband is used. By 2017-18, the share of females who contribute to the decisions on making large household purchases had gone down to 51.4 per cent, and only 53.3 per cent had a say on the way the money earned by the husband was used.

Our analysis of the link between household decision-making and IPV controls for a range of observable individual and household characteristics. Four groups of covariates are included in baseline models. The first group includes the female respondent's own characteristics such as their age, educational attainment, employment status and age at first marriage. The second group of covariates include husband's characteristics such as spousal age difference, educational attainment and employment type.[6] The third group of covariates include respondent's household characteristics such as the number, and gender and age composition of children, presence of extended family, and wealth status of the household. The final group of control variables are dummy variables for the respondent's location of residence which may capture the differences in local cultures, institutions, geography and socio-economic circumstances relevant for IPV. These include sets of dummy variables to distinguish between the 8 major regions of the country, as well as between urban and

[6] It is possible that own and husband's employment status are endogeneous in the context of this study. To address the implications of such possibility for the results, we re-estimated the baseline model excluding employment status variables from the list of covariates which left the results unaffected (available on request).

rural areas. Table A1 in the Appendix contains the descriptive statistics for all the control variables used in our analysis.

3.2. Estimation method

The aim of our empirical analyses is to estimate the propensity of a female being at risk of experiencing IPV. This risk is assumed to be influenced by an array of socioeconomic and demographic characteristics, as well as her autonomy, measured using her decision-making power. More formally, the propensity for a female i to experience IPV, $Violence_i$, is assumed to depend on her household decision-making power, $Decides_i$, together with a series of controls from Table A1 and a time dummy, and unobserved factors, ε_i, as follows:

$$Violence_i^* = \beta X_i + \delta Decides_i + \varepsilon_i \quad (1)$$

Assuming that observed $Violence_i$ relates to latent propensity through the criterion $Violence_i = 1(Violence_i^* \geq 0)$ and a standard normally-distributed ε_i, we estimate the following probit model:

$$\Pr(Violence_i = 1 | X_i, Decides_i) = \Phi(\beta X_i + \delta Decides_i) \quad (2)$$

Our identification strategy relies on a matching approach to study the impact of household decision-making on IPV for those females who have decision-making power in all situations (*treatment group*), compared to those who do not have such decision-making power but who are as similar as possible with regard to characteristics that affect IPV (*control group*). Accordingly, we estimate the average treatment on the treated (ATT) based on matching as follows:

$$\tau_{ATT}(x) = E[Violence(1)|T = 1, X = x] - E[Violence(1)|T = 0, X = x] \quad (3)$$

where T indicates whether an individual is in the treatment or control group, and x includes the characteristics that affect the outcome variable. To select the matches for individuals exposed to treatment, we employ entropy balancing that is based on employing a synthetic control group (Hainmueller 2012) and may be regarded as a generalisation of conventional matching approaches. First, we compute the weights (any non-negative values) that satisfy the balance constraints and

assign these to units not exposed to treatment. The balance constraints require equal covariate means across the treatment and the control groups, which ensures that the observations in the control groups are as similar as possible to those in the treatment group. We then use these weights in a regression estimation, which includes the treatment indicator as an explanatory variable and yields the estimate for the ATT.[7] We include all control variables in both the entropy balancing step as well as the regression equation, thereby making the estimator double-robust (Bang and Robins 2005). We estimate various specifications of this model, including additional checks for the robustness of the results to alternative definitions of outcome and explanatory variables.

The matching approach makes our identification strategy robust against selection on observables. However, despite the fact that we employ a rich set of conditioning variables, concerns over unobserved heterogeneity may still be there. For example, both IPV and female household decision-making autonomy may be driven by unobserved conservativeness norms of the household. A conventional approach to address this concern is to use an instrumental variable, however we have not been able to come up with a persuasive instrumental variable in our application. Instead, as a robustness check, we assess the extent of bias from unobservables by applying the partial identification method proposed by Oster (2019).[8] This approach evaluates how large the amount of selection on unobservables needs to be, relative to the amount of selection on observables, to explain away the entire effect of household decision-making on IPV. We evaluate the bias-adjusted coefficient derived by Oster (2019) as follows:

$$\beta^* \approx \tilde{\beta} - \delta[\dot{\beta} - \tilde{\beta}]\frac{R_{max}-\tilde{R}}{\tilde{R}-\dot{R}} \qquad (4)$$

where $\dot{\beta}$ and $\dot{R}$ are the coefficients and the R-squared from a regression with the treatment only, and $\tilde{\beta}$ and $\tilde{R}$ are the coefficients and the R-squared from a regression with the treatment and the observed

[7] As a robustness check, we also report estimates based on the conventional propensity score matching techniques (Rosenbaum and Rubin, 1983).

[8] For recent applications, see Carter et al. (2017), Couttenier et al. (2017), Mavisakalyan et al. (2018).

controls. δ denotes the relative importance of observable relative to unobservable variables in generating bias while R_{max} is the R-squared from a hypothetical regression that controls for both observables and unobservables. Since both of these measures are unknown, Oster (2019) proposes a bounding approach whereby the estimated effect of female decision-making autonomy on IPV should range from $\tilde{\beta}$ to β^* under an assumption of $\delta = 1$ and given the values of $R_{max} \in [\tilde{R}, 1]$. Based on evidence from randomised control studies published in reputable economics journals in the period from 2008-2013, Oster (2019) proposes setting $R_{max} = \min\{1.3\tilde{R}, 1\}$. We follow this approach to estimate R_{max} and the bounds accordingly. The results can be treated as robust if the identified set $[\tilde{\beta}, \beta^*]$ excludes zero. We also follow Oster (2019) to calculate δ; in this case $\delta > 1$ would indicate that the unobservables would have to be more important than the observables in explaining the outcome variable thereby indicating a robust result.

4. Results

4.1. Baseline results

We begin by estimating a parsimonious specification of equation (2) restricting $\beta = 0$. We then introduce the list of baseline controls described in section 3.1. to arrive at our extensive specification ($\beta \neq 0$). Columns (1) and (2) of Table 2 present the main results from estimating these specifications. The estimated marginal effects in both cases point to a negative statistically significant relationship between a female's involvement in household decision-making and her exposure to IPV, although the magnitude of the relationship in our extensive specification is smaller. Yet, these estimates do not imply a causal relationship, as females in treatment and control groups might have different socio-economic and demographic characteristics that might underlie the differential changes in experiences of IPV. In the first two columns of Table A2 in the Appendix, we present the sample means of observable characteristics separately for the treatment (*Female decides in all situations* = 1) and the

potential control (*Female decides in all situations* = 0) groups. A comparison across these two groups suggests that there are notable differences with respect to many pre-treatment characteristics. The relationship between female's involvement in household decision-making and the probability of experiencing IPV is likely to be incorrectly estimated, therefore, if no appropriate control group is selected before calculating the treatment effects.

----Table 2----

We take into account differences in the observed characteristics in column (3) of Table 2 where we report the results of a regression-adjusted matching procedure with entropy balancing described in Section 3.2. Females who decide in all situations are matched and compared to females who do not have such decision-making power but are as similar as possible with regards to characteristics that affect IPV. The sample means of the matching covariates in the synthetic control group obtained via entropy balancing are reported in column (3) of Appendix Table A2, while column (4) shows the differences in the means across the treatment and synthetic control groups alongside the associated t-test statistics and p-values. The results from Column (4) reassuringly demonstrate that all covariates are perfectly balanced – there are no statistically significant differences in the means across the two groups. Having ascertained the credibility of the synthetic control group, we estimate an ATT model as presented in equation (3). In this specification, we find that the variable *Female decides in all situations* remains statistically significant and negatively correlated to IPV. In particular, relative to a female with no autonomy, having full autonomy in decision-making is associated with a 4.7 percentage points reduction in IPV.[9] As a robustness check, in the final column of Table 2 we present

[9] Due to space considerations we focus on the estimates on *Female decides in all situations* here. The expanded set of results with estimates on all variables included in models reported in columns (2) and (3) of Table 2 are presented in Table A3 of the Appendix. We find that females with over primary-level schooling are less likely to experience IPV but those engaged in paid work more likely to do so – a result consistent with previous research (Naved and Amin 2013; Naved and Persson 2005). IPV prevalence is also lower for females whose husbands have over primary-level schooling and are employed. The probability of IPV also goes up with an increase in the number of children in the household; furthermore

the average treatment effects from nearest neighbour matching estimator. We obtain similar associations in all cases, confirming the significant and negative link between the female autonomy in household decision-making and her probability of experiencing IPV.

4.2. Robustness checks

In Table 2 we observed a strong negative association between female autonomy in household decision-making and her experience of IPV. However, this relationship might be sensitive to the way in which our outcome and explanatory measures are defined. We explore this possibility applying our regression-adjusted matching procedure with entropy balancing.

Firstly, we examine whether and how having full autonomy (measured using the variable *Female decides in all situations*) relates to alternative outcome measures. Our baseline measure of IPV measures whether or not the respondent has experienced IPV. Such a binary measure, however, does not take into account the extent of the violence, or the number of incidences of such violence.

To explore the relationship between a female's involvement in household decision-making and the number of incidences of violence, we estimate an Ordered Probit regression model of *Number of incidences of physical violence*, with four categories - 0, 1, 2 and 3 or more incidences of IPV. Columns (1)-(4) of Table 3 present the results from this estimation. By construction, the marginal effect on the lowest outcome (0 incidence) always has the opposite sign to that of the highest outcome (3 or more incidences). According to these results, an increase in a female's involvement in all aspects of household decision-making is associated with a decrease in her probability of experiencing a single case of IPV by 1.4 percentage points, the probability of experiencing 2 cases of IPV by 1.1 percentage points and in that of 3 or more cases of violence by 2.1 percentage points.

higher share of sons is positively associated with the probability of IPV while the association of IPV with the share of teenager or adult children is negative. IPV is less prevalent amongst relatively rich households.

In columns (5) and (6) we further explore whether a female's involvement in all aspects of household decision-making has implications for experiences of both moderate and severe forms of physical violence. Pushing, shaking, slapping or throwing something at the respondent are classified as acts of moderate violence, whereas punching with a fist or hitting by something harmful, kicking or dragging, strangling or burning, threatening with knife/gun or other weapon, twisting the arms or pulling the hair of the respondent are classified as acts of severe violence. The results suggest that a female's involvement in all aspects of household decision-making may indeed have implications for experiencing both moderate and severe forms of violence. There is a decrease of 4.5 percentage points in the probability of experiencing moderate physical violence associated with a female's involvement in all aspects of household decision-making. Being involved in all aspects of household decision-making is also associated with a 2.3 percentage points decrease in the probability of experiencing severe physical violence.

----Table 3----

Secondly, we explore if female autonomy through greater involvement in household decision-making is associated with distinct attitudes towards IPV. In Column (1) of Table 4 we report the estimated marginal effects from a Probit regression where the dependent variable is constructed such that it takes on a value of 1 if the female respondent held the view that wife beating is justified in at least one situation. Indeed, it appears that female involvement in household decision-making is associated with significantly lower tolerance for IPV. In particular, a female who is involved in all aspects of household decision-making has a 17 percentage points lower probability of justifying wife beating. We observe a similar relationship when we alter the dependent variable to distinguish between the number of situations where the respondent thinks wife beating is justified. This is estimated using an Ordered probit model (columns (2)-(5)).

Thirdly, although the focus of our analysis is physical violence, we observe a high prevalence of emotional and sexual violence around the world, that is linked to physical violence. Therefore, as an

extension to our analysis we examine whether a female's involvement in household decision-making is also negatively related to her exposure to such forms of violence. As the results reported in columns (6)-(7) of Table 4 show, indeed it is. A female who participates in all aspects of household decision-making has a 5.3 percentage points lower probability of experiencing emotional violence. Her probability of experiencing sexual violence is also 2.1 percentage points lower.

----Table 4----

Our baseline results are robust to various measures of our outcome variables of interest (measures of IPV). To assess if they are also robust to the way in which we define female involvement in household decision-making, we conduct additional robustness checks which are reported in Table 5. Our baseline measure of household decision-making is a binary variable that takes on a value of 1 if the respondent has a say in decision-making, either alone or jointly with her husband, in four domains of household decision-making. These include: large household purchases, how money earned by the husband is spent, visits to family, friends or relatives and respondent's own health care. This measure, however, conceals the potentially large differences in the extent and the nature of involvement in household decision-making. To explore if this has implications for our results, we distinguish between the number of situations when a female has decision-making authority. The first column of Table 5 reports these results. The set of our predictor variables of interest allows us to distinguish between the cases when a female (i) never decides or decides just in 1 situation; (ii) decides in 2 to 3 situations; and (iii) decides in all 4 situations (omitted reference category). Consistent with our central result, the estimated marginal effects on these decision-making variables are positive. Relative to a female with full decision-making autonomy, a female who has no decision-making autonomy/can only decide in one situation, has a statistically significant and 5.7 percentage points higher probability of experiencing IPV. A similar effect is observed when moving to a state where she decides in just 2-3 situations relative to a state when she decided in all situations.

Next, we consider whether involvement in different types of household decisions affect the probability of experiencing IPV differently. To this end, we exploit the presence of detailed information in PDHS, and consider the role of female involvement in decision-making over the four domains separately. We include binary measures for each situation as single regressors in the first instance, in view of possible collinearities (columns (2)-(5) of Table 5). In all four models, the estimated marginal effects on these decision-making variables are negative, which is consistent with our baseline result. However, there are important differences in the estimated magnitudes. In particular, the association is about the same for decisions involving large household purchases, use of money earned by the husband, and family or relative visits, but the estimated marginal effect is almost half as large for decisions involving the woman's own health care. This result suggests that there may be other factors, e.g. institutional policies, contributing to a woman's ability to make decisions about her own health. Furthermore, when all four decision-making variables are simultaneously included as controls (column (6)), only the estimated marginal effects on *Female decides on the use of money husband earned* and *Female decides on visits to family or relatives* remain statistically significant.

----Table 5----

The matching approach applied across the different estimations makes our identification strategy robust against selection on observables. Here we assess the extent of bias from unobservables given that we cannot be sure that we have included all the relevant controls in the models in spite of the extensive list of baseline controls employed. We do so by applying the partial identification method proposed by Oster (2019) and summarised in section 3.2. The results of this exercise are presented in Table 6.

----Table 6----

First, we report the estimate of δ that would be needed to explain away the entire causal effect of female decision-making autonomy on experiences of IPV. Second, we report the coefficient bounds;

the first bound comes from the linear specification controlling for all baseline observables while the second bound β^* is evaluated using equation (4) and applying the rule of thumb proposed by Oster (2019) in setting R_{max} equal to the minimum of 1 or to the R-squared from the regression controlling for all observables multiplied by a factor of 1.3. The results provide some assurance that our baseline results on the link between female involvement in household decision-making and her probability of experiencing IPV are robust to omitted variables since $\delta > 1$, i.e. the unobservables would have to be more important than the observables in explaining IPV, and the estimated bounds exclude 0.

5. Conclusion and discussion

South Asia has among the highest rates of IPV globally and understanding its key determinants, therefore, is essential. This study focuses on one such determinant of IPV, female autonomy, in an under-researched context of Pakistan where the existing evidence is largely limited to small sample case studies or data from specific contexts. Pakistan is a particularly relevant context for our analysis given its traditional social norms and reportedly high incidence of domestic violence.

The relationship between female autonomy and experience of IPV is theoretically ambiguous. On the one hand, consistent with theory of expressive violence, increase in female autonomy is expected to reduce IPV. On the other hand, however, it may in fact increase the risk of IPV if violence is used as a mechanism to control spouses by abusers, as the theory of instrumental violence posits. In this study using nationally representative data from Pakistan, we examine the links between female involvement in household decision-making (a measure of her autonomy) indicators and experience of IPV. The results are consistent with the first theoretical prediction. According to our baseline results the probability of experiencing IPV is lower by 4.7 percentage points for females who have full autonomy in household decision-making. Moreover, we show that higher female autonomy in household-decision making is also associated with lower likelihood of experiencing emotional and sexual forms of violence as well as with less tolerant attitudes for IPV.

We address the issue of selection on observables by employing an entropy balancing approach to account for differences in females' observable characteristics and their likelihood of possessing autonomy in household decision-making. To address the issue of selection on unobservables, we employ a partial identification approach which assesses how strong selection on unobservables would need to be relative to selection on observables to purge our estimates of any causal interpretation. Our estimates point to a possible negative causal effect of female autonomy on IPV, although we are not able to offer point estimates in such setup. Our approaches to identification are novel to the literature on the link between female autonomy and IPV and offer useful robustness checks to be considered in studies that rely on natural experiments and instruments for identification. While the clear causal interpretation is an important strength in such identification approaches, their validity relies on exclusion restrictions that are not always immune to violation.

Our estimation approach mitigates some but not all concerns around endogeneity. One limitation of the study is that we do not know precisely when the IPV and particular household decision-making arrangements began, so we cannot rule out the possibility that IPV impinges on female autonomy – a scenario consistent with the hypothesis proposed by Eswaran and Malhotra (2011). However, a likely implication of this possibility is that the true magnitude of the effect of female autonomy on IPV is potentially larger than that which we report in the paper. Nonetheless, given our ability to estimate causal effects directly in the current empirical setup, a conservative approach would be to interpret the results as carefully estimated partial correlations.

In spite of these limitations, the results of this study have important policy implications. They suggest that the returns in addressing female autonomy in some developing country contexts may be potentially higher than we think. Our results specifically call for a greater focus on female autonomy in policy efforts directly concerned by IPV reduction in such country contexts. By increasing female autonomy, with interventions such as conditional cash transfers, we may be able to see reduction of experiences of IPV in cases like Pakistan. However, in some other country contexts, we have seen

female empowerment lead to higher incidences of IPV as we discuss in section 2, consistent with the theory of instrumental violence. Differences in cultural and institutional features across countries are likely to play a role in explaining such differences in the links between female autonomy and incidences of IPV. As such, cross-country analysis of the link between female autonomy and IPV is an important direction of future research.

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Tables

Table 1: Summary statistics of key variables

Variable	Mean (s.d.)	
	2012-13	2017-18
Outcome variables		
Experienced physical violence in the past year	0.200	0.157
	(0.400)	(0.364)
Was pushed, shaken or had something thrown by husband	0.116	0.103
	(0.320)	(0.304)
Was slapped by husband	0.171	0.135
	(0.376)	(0.342)
Was punched with fist or hit by something harmful by husband	0.051	0.043
	(0.220)	(0.204)
Was kicked or dragged by husband	0.031	0.037
	(0.173)	(0.189)
Was strangled or burnt by husband	0.013	0.009
	(0.112)	(0.093)
Was threatened with knife/gun or other weapon by husband	0.012	0.005
	(0.107)	(0.067)
Had arm twisted or hair pulled by husband	0.066	0.065
	(0.248)	(0.246)
Number of incidences of physical violence	0.458	0.397
	(1.145)	(1.089)
Predictor variables		
Female decides in all situations	0.431	0.370
	(0.495)	(0.483)
Female decides on making large household purchases	0.578	0.514
	(0.494)	(0.500)
Female decides on the use of money husband earned	0.556	0.533
	(0.497)	(0.499)
Female decides on visits to family or relatives	0.633	0.554
	(0.482)	(0.497)
Female decides on own health care	0.591	0.558
	(0.492)	(0.497)
Number of situations female decides	2.358	2.159
	(1.705)	(1.695)
N	2594	3304

Table 2: Female decision-making autonomy and IPV – baseline results

	(1)	(2)	(3)	(4)
Female decides	-0.088***	-0.051***	-0.047***	-0.051***
in all situations	(0.010)	(0.010)	(0.009)	(0.015)
Baseline controls	No	Yes	Yes	Yes
N	5898	5898	5898	5898

Notes: Dependent variable is *Experienced physical violence in the past year*. Columns (1) and (2) report probit marginal effects without matching while column (3) employs weights from entropy balancing. See Appendix Table A3 for expanded sets of results of regressions in columns (2) and (3). Columns (4) reports the estimates from propensity score matching employing nearest neighbour matching estimator with bandwidth = 0.0009 and with standard errors calculated from bootstrapping with 50 replications; the propensity scores are calculated using the entire set of baseline controls. Standard errors in parentheses. * denotes significance at 10%; ** at 5%; *** at 1% levels.

Table 3: Robustness checks: alternative outcome variables – number and severity of physical violence incidences

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Number of incidences of physical violence				Experienced moderate physical violence in the past year	Experienced severe physical violence in the past year
	0	1	2	3+		
Female decides in all situations	0.046***	-0.014***	-0.011***	-0.021***	-0.045***	-0.023***
	(0.009)	(0.003)	(0.002)	(0.004)	(0.009)	(0.007)
Baseline controls	Yes				Yes	Yes
N	5898				5898	5898

Notes: Columns (1)-(4) report the marginal effects from an ordered probit regression of *Number of incidences of physical violence*; column (5) reports the marginal effects from a probit regression of *Experienced moderate physical violence in the past year*; column (6) reports the marginal effects from a probit regression of *Experienced severe physical violence in the past year*. Standard errors in parentheses. All regressions use weights from entropy balancing. * denotes significance at 10%; ** at 5%; *** at 1% levels.

Table 4: Robustness checks: alternative outcome variables – attitudes to violence and other forms of violence

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Wife beating is justified in at least 1 situation	Number of situations wife beating is justified				Experienced emotional violence in the past year	Experienced sexual violence in the past year
		0	1	2	3+		
Female decides in all situations	-0.170***	0.158***	-0.018***	-0.022***	-0.119***	-0.053***	-0.021***
	(0.014)	(0.013)	(0.002)	(0.002)	(0.010)	(0.012)	(0.006)
Baseline controls	Yes			Yes		Yes	Yes
N	5898			5898		5895	3304

Notes: Column (1) reports the marginal effects from a probit regression of *Wife beating is justified in at least 1 situation*; columns (2)-(5) report the marginal effects from ordered probit regression of *Number of situations wife beating is justified*; column (6) reports the marginal effects from a probit regression of *Experienced emotional violence in the past year;* column (7) reports the marginal effects from a probit regression of *Experienced sexual violence in the past year* (available in 2017-18 wave only). Standard errors in parentheses. All regressions use weights from entropy balancing. * denotes significance at 10%; ** at 5%; *** at 1% levels.

Table 5: Robustness checks: alternative predictor variables – probit marginal effects

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Female decides in 0-1 situations	0.057***					
	(0.012)					
Female decides in 2-3 situations	0.035***					
	(0.013)					
Female decides on making large household purchases		-0.041***				-0.001
		(0.010)				(0.020)
Female decides on the use of money husband earned			-0.056***			-0.055***
			(0.011)			(0.014)
Female decides on visits to family or relatives				-0.047***		-0.029*
				(0.011)		(0.016)
Female decides on own health care					-0.029***	0.025
					(0.010)	(0.020)
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
N	5898	5898	5898	5898	5898	5898

Notes: Dependent variable is *Experienced physical violence in the past year*. *Female decides in all 4 situations* is the omitted category in column (1). Standard errors in parentheses. All regressions use weights from entropy balancing. * denotes significance at 10%; ** at 5%; *** at 1% levels.

Table 6: Robustness test of omitted variable bias

Proportionality		Identified set	
$\delta_{R_{max}=\min\{1.3\tilde{R},1\}}$	$\lvert\delta\rvert > 1$	$[\tilde{\beta},\ \beta^*_{(R_{max}=\min\{1.3\tilde{R},1\},\delta=1)}]$	Excludes 0?
2.843	Yes	[-0.049, -0.034]	Yes
Baseline controls		Yes	
N		5898	

Notes: Dependent variable is *Experienced physical violence in the past year*. δ indicates the value of proportional selection of unobservables to observable assuming the maximum value of theoretical R^2 is R_{max}. The coefficient bounds are calculated assuming the unobservables are as important as the observable in explaining the outcome variable, i.e. δ = 1, and $\delta_{R_{max}=\min\{1.3\tilde{R},1\}}$. Since the test can only be performed with linear models, a linear probability model is used to estimate the probability of IPV instead of a probit model.

Appendix

Table A1: Summary statistics of control variables

Variable	Mean (s.d.)	
	2012-13	2017-18
Own characteristics		
Age 15-25	0.419	0.357
	(0.494)	(0.479)
Age 26-36	0.434	0.443
	(0.496)	(0.497)
Age 37-49 (omitted)	0.146	0.200
	(0.354)	(0.400)
No educ (omitted)	0.571	0.502
	(0.495)	(0.500)
Incomplete primary educ	0.057	0.048
	(0.231)	(0.214)
Primary educ	0.086	0.087
	(0.280)	(0.282)
Over primary educ	0.287	0.363
	(0.453)	(0.481)
Not working (omitted)	0.746	0.842
	(0.435)	(0.365)
Works - unpaid	0.022	0.014
	(0.147)	(0.117)
Works - paid	0.232	0.144
	(0.422)	(0.351)
Age at first marriage	18.652	19.469
	(3.913)	(4.192)
Husband characteristics		
Husband age – own age	5.717	5.255
	(5.483)	(5.083)
Husband no educ (omitted)	0.316	0.278
	(0.465)	(0.448)
Husband incomplete primary educ	0.047	0.044
	(0.211)	(0.206)
Husband primary educ	0.092	0.091
	(0.289)	(0.287)
Husband over primary educ	0.545	0.587
	(0.498)	(0.492)
Husband not working (omitted)	0.018	0.019
	(0.133)	(0.138)
Husband works – unskilled*	0.274	0.212
	(0.446)	(0.409)
Husband works – agriculture	0.135	0.130
	(0.342)	(0.337)
Husband works – services	0.107	0.074
	(0.309)	(0.262)
Husband works – professional**	0.466	0.564
	(0.499)	(0.496)
Household characteristics		

N. children	3.943	3.455
	(2.315)	(2.294)
Share of sons	0.524	0.483
	(0.312)	(0.328)
Share of teenager or adult children	0.263	0.206
	(0.304)	(0.281)
Extended family	0.646	0.665
	(0.478)	(0.472)
Wealth – poorest (omitted)^	0.187	0.190
	(0.390)	(0.392)
Wealth – poorer^	0.192	0.229
	(0.394)	(0.420)
Wealth – middle^	0.178	0.190
	(0.383)	(0.393)
Wealth – richer^	0.209	0.181
	(0.407)	(0.385)
Wealth – richest^	0.234	0.210
	(0.423)	(0.408)
Region characteristics		
Urban	0.495	0.501
	(0.500)	(0.500)
Punjab	0.290	0.227
	(0.454)	(0.419)
Sindh	0.236	0.196
	(0.425)	(0.397)
Khyber Pakhtunkhwa	0.167	0.140
	(0.373)	(0.347)
Balochistan	0.139	0.109
	(0.346)	(0.312)
Gilgit Baltistan	0.089	0.068
	(0.284)	(0.252)
Azad Jammu and Kashmir	0.000	0.125
	(0.000)	(0.331)
FATA	0.000	0.058
	(0.000)	(0.234)
Islamabad (omitted)	0.079	0.076
	(0.270)	(0.265)
N	2594	3304

Notes: *Unskilled manual and household and domestic jobs are categorised as 'unskilled'; **Professional/technical/managerial, clerical, sales and skilled manual jobs are categorised as 'professional'. ^The dataset contains a relative wealth index measure. Using data on household asset ownership a wealth index was generated using principal component analysis, and the sample was then divided into five wealth quintiles.

Table A2: Covariate balancing

Variable	(1)	(2)	(3)		(4)	
	Female decides in all situations =1	*Female decides in all situations*=0	Synthetic control group	Difference (1)-(3)	t-test	p-value
Age 15-25	0.440	0.348	0.440	0.000	0.019	0.985
Age 26-36	0.425	0.448	0.425	0.000	0.003	0.997

Incomplete primary educ	0.049	0.054	0.049	0.000	0.006	0.995
Primary educ	0.104	0.075	0.103	0.000	0.016	0.987
Over primary educ	0.386	0.293	0.385	0.001	0.046	0.964
Works - unpaid	0.020	0.016	0.020	0.000	0.007	0.994
Works - paid	0.204	0.169	0.203	0.000	0.020	0.984
Age at first marriage	19.420	18.910	19.410	0.010	0.028	0.978
Husband age – own age	5.368	5.518	5.368	-0.000	-0.002	0.999
Husband incomplete primary educ	0.050	0.042	0.050	-0.000	-0.001	0.999
Husband primary educ	0.090	0.092	0.090	0.000	0.005	0.996
Husband over primary educ	0.601	0.547	0.600	0.000	0.024	0.981
Husband works – unskilled*	0.240	0.239	0.240	-0.000	-0.010	0.992
Husband works – agriculture	0.112	0.146	0.112	-0.000	-0.016	0.987
Husband works – services	0.091	0.087	0.091	0.000	0.002	0.998
Husband works – professional**	0.540	0.509	0.539	0.000	0.019	0.985
N. children	3.654	3.680	3.655	-0.001	-0.014	0.989
Share of sons	0.510	0.495	0.510	0.000	0.008	0.993
Share of teenager or adult children	0.265	0.209	0.265	0.000	0.016	0.987
Extended family	0.628	0.675	0.628	-0.000	-0.006	0.995
Wealth – poorer^	0.190	0.227	0.190	-0.000	-0.023	0.981
Wealth – middle^	0.185	0.185	0.185	0.000	0.005	0.996
Wealth – richer^	0.225	0.172	0.225	0.000	0.024	0.981
Wealth – richest^	0.266	0.191	0.266	0.001	0.039	0.969
Urban	0.540	0.471	0.540	0.000	0.025	0.980
Punjab	0.323	0.210	0.323	0.001	0.054	0.957
Sindh	0.243	0.194	0.243	0.001	0.042	0.967
Khyber Pakhtunkhwa	0.116	0.176	0.116	0.000	0.014	0.989
Balochistan	0.059	0.164	0.060	-0.001	-0.110	0.912
Gilgit Baltistan	0.068	0.084	0.067	0.000	0.016	0.987
Azad Jammu and Kashmir	0.007	0.049	0.008	-0.001	0.025	0.980
FATA	0.095	0.054	0.095	-0.001	-0.452	0.651
Year 2017	0.522	0.585	0.523	-0.001	-0.040	0.968
N	2339	3559	2339			

Notes: Column (4) reports differences in the average conditions between treatment and synthetic control groups and the corresponding t-test statistics and p-values. *Unskilled manual and household and domestic jobs are categorised as 'unskilled'; **Professional/technical/managerial, clerical, sales and skilled manual jobs are categorised as 'professional'. ^The dataset contains a relative wealth index measure. Using data on household asset ownership a wealth index was generated using principal component analysis, and the sample was then divided into five wealth quintiles.

Table A3: Female decision-making autonomy and IPV – baseline results expanded

Variable	(1)	(2)
Female decides in all situations	-0.051***	-0.047***
	(0.010)	(0.009)
Age 15-25	-0.025	-0.033
	(0.024)	(0.025)
Age 26-36	0.001	-0.006
	(0.017)	(0.019)
Incomplete primary educ	-0.001	0.006
	(0.025)	(0.026)
Primary educ	0.030	0.025
	(0.022)	(0.022)
Over primary educ	-0.044***	-0.030*
	(0.016)	(0.017)
Works - unpaid	-0.040	-0.041
	(0.035)	(0.033)
Works - paid	0.028*	0.033**
	(0.015)	(0.015)
Age at first marriage	0.001	0.001
	(0.002)	(0.002)
Husband age – own age	-0.001	-0.001
	(0.001)	(0.001)
Husband incomplete primary educ	0.023	0.020
	(0.028)	(0.030)
Husband primary educ	-0.008	-0.013
	(0.020)	(0.022)
Husband over primary educ	-0.028**	-0.048***
	(0.014)	(0.016)
Husband works – unskilled*	-0.058	-0.094*
	(0.043)	(0.052)
Husband works – agriculture	-0.061	-0.088*
	(0.044)	(0.053)
Husband works – services	-0.058	-0.096*
	(0.045)	(0.054)
Husband works – professional**	-0.029	-0.058
	(0.043)	(0.052)
N. children	0.010***	0.013***
	(0.003)	(0.003)
Share of sons	0.047***	0.042**
	(0.017)	(0.017)
Share of teenager or adult children	-0.078**	-0.065**
	(0.031)	(0.031)
Extended family	-0.011	-0.015
	(0.012)	(0.013)
Wealth – poorer^	-0.017	-0.032
	(0.019)	(0.021)
Wealth – middle^	-0.040**	-0.045**

	(0.021)	(0.023)
Wealth – richer^	-0.064***	-0.063**
	(0.023)	(0.025)
Wealth – richest^	-0.099***	-0.096***
	(0.024)	(0.027)
Year 2017	-0.047***	-0.050***
	(0.011)	(0.012)
Regions	Yes	Yes
N	5898	5898

Notes: Dependent variable is *Experienced physical violence in the past year*. Standard errors in parentheses. *Unskilled manual and household and domestic jobs are categorised as 'unskilled'; **Professional/technical/managerial, clerical, sales and skilled manual jobs are categorised as 'professional'. ^The dataset contains a relative wealth index measure. Using data on household asset ownership a wealth index was generated using principal component analysis, and the sample was then divided into five wealth quintiles. Column (1) reports probit marginal effects without matching while column (2) employs weights from entropy balancing. * denotes significance at 10%; ** at 5%; *** at 1% levels.

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