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DOES WOMEN'S LABOR FORCE PARTICIPATION REDUCE DOMESTIC VIOLENCE? EVIDENCE FROM JORDAN

Jana Lenze and Stephan Klasen

ABSTRACT

Enhancing women's labor force participation is seen as a way to promote their empowerment and improve their well-being and that of their children. The empirical literature on the relationship between women's employment status and domestic violence is less clear-cut. Using quantitative data from Jordan in 2007, this study explores the effect of women's employment, as measured by their participation in paid work outside the home, on reported domestic violence, controlling for the potential endogeneity of women's employment, which might bias the relationship between employment and domestic violence. Without taking endogeneity into account, the regression results suggest that a woman's participation in paid work enhances violence by her husband. After controlling for endogeneity, these results turn out to be insignificant, which suggests that women's work status has no causal influence on marital violence. Differentiating between various types of domestic violence provides weak evidence that women's employment lowers sexual violence.

KEYWORDS

Women's work, violence against women, bargaining models

JEL-Codes:: D63, J16, J12

INTRODUCTION

In the Middle East, women make up about 28 percent of the working population while in comparable middle-income countries the proportion

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is about 43 percent. In 2005, women's labor force participation in Jordan was 14.9 percent, far below regional rates and other lower middle-income countries (World Bank 2004; Economic and Social Council 2008; Isis Gaddis and Stephan Klasen 2014). Yet, women's employment is desirable on intrinsic and instrumental grounds. Following Sen's capability approach, work constitutes an important element of women's well-being and empowerment (Amartya Sen 1999). Empirical studies indicate that women who have access to economic resources invest in their children's education and nutrition and preventative healthcare, and have lower fertility rates (Seema Vyas and Charlotte Watts 2009). In fact, women's employment has been found to be a robust factor reducing fertility, child mortality, and gender bias in mortality (Mamta Murthi, Anne-Catherine Guio, and Jean Drèze 1995; Stephan Klasen and Claudia Wink 2003). Reducing gender gaps in employment has also been seen as a determinant of economic growth using cross-national and cross-regional studies (Berta Esteve-Volart 2004; Stephan Klasen and Francesca Lamanna 2009).

There may also be negative impacts of women's employment on their well-being by leading to more domestic violence. The link between domestic violence and a woman's involvement in paid work is unclear. Some studies find a "protective" effect since earned income promotes empowerment, which leads to a better household bargaining position.¹ Other studies indicate that women's employment increases spousal violence, since husbands see their role as breadwinners undermined.

A key concern is the potential endogeneity of women's working status and violence, due to reverse causality or omitted variable bias. It may be the case that domestic violence leads women to seek employment; for instance, a recent study in the Indian context by Haimanti Bhattacharya (2015) finds that women who experienced spousal violence are more likely to be employed than women who are not exposed to violence. In addition, unobserved factors could drive the women's decision in favor of work and their husbands' violence. To address these issues, several linear probability models and probit regressions using instrumental variables (IV) are implemented. While our regular results without controlling for endogeneity indeed show that employment outside of the home increases domestic violence, we find a statistically and economically insignificant effect of employment on domestic violence in the IV specification, suggesting that endogeneity bias is indeed a problem and leads to a spurious positive relationship between employment and domestic violence. When we disaggregate by different forms of domestic violence, these results are replicated for emotional and physical violence. In the case of sexual violence, we actually find weak evidence of a protective effect of women's employment.

DOMESTIC VIOLENCE IN JORDAN
THEORETICAL BACKGROUND

Theories of domestic violence

Bargaining models

Noncooperative bargaining models of domestic violence, such as Amy Farmer and Jill Tiefenthaler's (1996), predict that an increase in women's economic empowerment through earned income or financial support from outside the marriage will decrease the level of violence within households. Women's financial independence will increase their probability of leaving the abusive relationship, which may lead to the end of the partnership or a decrease in violence. Helen V. Tauchen, Ann Dryden Witte, and Sharon K. Long (1991) developed a Nash-bargaining model of domestic violence to represent the effect of changes in income on domestic violence. In their model, every spouse has a specific level of the threat-point, which should provide the minimum level of welfare of each spouse within the relationship. The woman's threat-point determines the level of violence she is willing to accept without leaving the marriage given a specific amount of financial transfers from her husband. The model predicts that an increase in the man's income enables him to "buy" more violence by increasing the financial transfers to his wife. On the other hand, an increase in the woman's income constrains him to reduce violent behavior. Similarly, in resource theory, women's income leads to a higher household income. This resource effect decreases household economic stress and thereby reduces spousal violence (Richard J. Gelles 1997). All of these models predict a protective effect for women's employment.

Male-backlash models

Sociological "male-backlash" models predict the opposite. As women's wages increase, violence against them increases, since men feel their traditional gender role as threatened. According to Ross Macmillan and Rosemary Gartner (1999), marital relationships are dominated by socially and culturally prescribed gender roles. To the extent that women's independence changes these roles, women experience more violence since men try to compensate for lost authority.

As Anna Aizer (2007) argues, male-backlash theories do not take into account women's rationality constraint and ignore the possibility that women can choose to end the relationship. In Jordan, women do not have attractive outside options. The divorce rate is quite low, around 1.96 percent. The legal system, based on sharia, impedes divorce since separation is accompanied by significant social stigma and economic distress. In this context, the threat of ending the marriage may not

be credible, and a bargaining model may not be appropriate (Manasi Bhattacharya, Arjun S. Bedi, and Amrita Chhachhi 2011). The most common divorce procedure is the *talaq* (“arbitrary” divorce), which is exclusively the husband’s right to divorce his wife without providing any legal reasons. The law recognizes the wife’s right to financial compensation after an arbitrary divorce, and she gets compensated for no less than one year and no more than three years. If the wife is seeking a divorce in Jordan, she gives up all her financial marital rights and may face an insecure economic situation after divorce (Amira El Azhary Sonbol 2003).

Previous empirical findings

The existing empirical evidence on the effect of women’s economic empowerment is not clear-cut. Macmillan and Gartner (1999) analyze the relationship between women’s employment and spousal violence in Canada. Their results indicate that the effect of women’s employment on marital violence depends on men’s working status. If the husband is unemployed, the risk of violence decreases if the woman works, whereas it increases for working women when the husband is employed. Bhattacharya, Bedi, and Chhachhi (2011) explore the link between women’s work status and property ownership and domestic violence in India. Taking into account the potential endogeneity of this relationship, they instrument women’s employment status by membership in a specific caste.² The estimation results show that women’s participation in paid work is associated with a sharp reduction in spousal violence. A further qualitative study by Seema Vyas, Jessie Mbwambo, and Lori Heise (2015) explores the link between women’s paid work and intimate partner violence in the context of Tanzania. Focusing on semi-structured interviews on women engaged in informal-sector trading activities, they find no association between women’s independent income and partner violence. Yet, the results suggest that women were able to spend their earned income according to their needs, which in turn reduced conflict due to negotiations over money.

Maxine P. Atkinson, Theodore N. Greenstein, and Molly Monahan Lang (2005) support the male-backlash theory. They analyze the incidence of violence under consideration of cultural variables and traditional gender roles. Using an index of traditionalism, the effect of the relative income on the incidence of violence is tested. The estimation results indicate that the share of women’s income is only positively correlated with spousal violence if the husband has a traditional ideology. Francis Bloch and Vijayendra Rao (2002) use survey data from three villages in India, finding that the risk of spousal violence is higher for women from rich households. The regression results suggest that dissatisfied men inflict violence to extract more money from their wives’ families.

Not many studies are available from Middle Eastern countries. Sunita Kishor and Kiersten Johnson (2004) find a positive relationship between women's paid work and the incidence of violence in Iran and a negative significant effect in Egypt. Kathryn M. Yount (2005) investigates the relationship between woman's socioeconomic dependence and physical abuse among married women in Egypt. Multivariate findings suggest that greater differences between a woman and her husband's socioeconomic status are associated with a higher probability of physical abuse.

With the exception of the study by Bhattacharya, Bedi, and Chhachhi (2011), none of these studies control explicitly for the endogeneity of women's employment, which may bias the results.

DATA

The analysis in this paper is based on the household- and women-only questionnaire of the 2007 Jordan Population and Family Health Survey (JPFHS). The data were collected by Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys (MEASURE DHS) initiated by the United States Agency for International Development (USAID) to provide data for demography, health, and nutrition for children and women in developing countries. A nationally representative sample of 14,564 households in Jordan were interviewed, including 10,867 ever-married women ages 15–49. The nonresponse rate is less than 1 percent. All twelve governorates of Jordan are included, as well as urban and rural areas and the Badia desert region in the south.

The women-only questionnaire includes a special section regarding domestic violence and women's empowerment. In order to identify if the woman experienced *emotional violence*, the following questions were asked: Does/did your husband ever: say something to humiliate you in front of others/threaten to hurt or harm you or someone close to you?

To reveal the extent of *physical violence*, they asked: Does/did your husband ever: push you, shake you, or throw something at you/slap you or twist your arm/punch you with his fist or with something that could hurt you/kick you, drag you or beat you up/try to choke you or burn you on purpose/threaten you with a knife, gun, or any other weapon/attack you with a knife, gun, or any other weapon?

To identify if the women experienced any *sexual violence*, they asked: Does/did your husband ever physically force you to have sexual intercourse with him even when you did not want to?

These three different kinds of violence, emotional, physical, and sexual, were summarized to an index of spousal violence that represents the dependent variable in our regression analysis. If any of the three questions are answered with a yes, the variable is 1. In a robustness check, we also use the three indicators separately. The dependent variable, domestic violence,

is a binary variable that can only take the values 0 or 1. A linear probability model is implemented to estimate the probability of a woman experiencing domestic violence. As a great proportion of predicted probabilities falls between 0 and 1, the estimates are expected to be unbiased and consistent (William C. Horrace and Ronald L. Oaxaca 2006).³

EMPIRICAL SPECIFICATION

The linear probability model includes socioeconomic characteristics, household data, and regional components. The presence of domestic violence is modeled as,

$$DV = \beta_0 + \beta_1 \text{woman's working status} + \beta_2 \text{Characteristics} \\ \text{Husband/Wife} + \beta_3 \text{HH} - \text{Characteristics} + \beta_4 \text{Region} + \varepsilon_i \quad (1)$$

The dependent variable domestic violence captures the incidence of emotional, physical, and sexual violence in the household. The key independent variable, woman's working status, indicates whether the woman is involved in paid work outside the home. We also add a range of control variables, including characteristics of husband and wife, such as education, husband's employment status, age difference between the spouses, and household characteristics, including the number of household members as well as economic status.

Other control variables include the number of co-wives and, given the prevalence of kinship marriages in Jordan, the degree of kinship between spouses. Since there are vast differences in the economic and social structure of the different governorates of Jordan, they are captured by regional dummy variables. ε represents other unobservable factors that are captured by an independent and identically distributed (IID) error term.

Endogeneity issues

A key concern in this regression is the potential endogeneity between women's working status and domestic violence. Endogeneity can have several sources, two of which may be present in this model, namely simultaneous causality and omitted variables. The presence of violence may lead a woman to increase or decrease her willingness to work. Most studies suggest that violence reduces women's employment due to mental and physical health consequences (Susann L. Staggs and Stephanie Riger 2005; Richard M. Tolman and Hui-Chen Wang 2005), increasing tardiness and absenteeism (Susan Lloyd 1997; Stephanie Riger, Courtney E. Ahrens, and Amy Blickenstaff 2000). On the other hand, abused women might be more likely than non-abused women to seek paid work (Deepa Narayan, Robert Chambers, Meera K. Shah, and Patti Petesch 2000). Studies from

developing countries find mixed results as regards the probability that an abused woman works outside the home, since abused women are both more likely and less likely to work (Andrew R. Morrison and María B. Orlando 1999). In this case, causality would run both ways, leading to a biased coefficient on women's employment.

Work status and domestic violence may also be driven by a third unobserved factor such as traditionalism. These two possibilities of endogeneity suggest that in equation (1) the observed relationship between women's working status and domestic violence may be biased or even spurious. However, the direction of bias can be ambiguous. Although employment status and traditionalism is likely to be negatively correlated, the effect of traditionalism on violence could be positive or negative. Under the assumption that the incidence of violence is positively correlated with the degree of traditionalism (assuming that a more traditionally socialized spouse does not allow his wife to work), we may have a downward bias, finding a spurious negative correlation. Of course, if traditional husbands beat their wives less (and ensure that they work less), there could be a spurious positive correlation, leading to an overestimate of the coefficient on the employment status.⁴ In this case, the coefficient of women's employment status is underestimated. With respect to reverse causality, the bias is hard to quantify. If violence causes women to work less, it may lead to a downward bias of the coefficient (an underestimation); if it causes women to work more, it would lead to an upward bias. Existing literature suggests that estimates of the effect of women's employment are more likely to be underestimated (Michael P. Johnson 1995; Farmer and Tiefenthaler 1996).

To tackle the issue of endogeneity through omitted variables and reverse causality, a two-stage linear probability model is implemented. Specifically, the first stage is defined by

$$\textit{Working status} = \Pi_0 + \Pi_1 z_1 + \Pi_2 z_2 + v_i \quad (2)$$

where working status is predicted by the exogenous instruments z_1 and the control variables z_2 (which overlap with the variables in [1]). The error term v_i captures the remaining variance of *working status*, which is not explained by the covariates (including the instrument) in equation (2). In the second stage, the outcome, domestic violence, is regressed on the predicted value of the endogenous variable, working status, from the first stage along with other exogenous variables. Several studies have shown that estimating a linear probability model via "two-stage least squares" provides a good estimate of the average effect, making the magnitude of the coefficients easier to obtain (Edward Miguel, Shanker Satyanath, and Ernest Sergenti 2004; Joshua D. Angrist and Jörn-Steffen Pischke 2009; Jeffrey M. Wooldridge 2010).⁵ As there are questions regarding the

consistency of these IV estimation techniques when there is a limited dependent variable in both stages, we also estimate the model using the two-stage residual inclusion method (2SRI) as a further robustness check.⁶ As *wife's working status* is a binary endogenous regressor, this method delivers consistent estimates in nonlinear models (Wooldridge 2010). In the first stage, the auxiliary equation (2) is estimated as a probit model. In the second stage regression, the endogenous variable *wife's working status* is not replaced. Instead, the residual term (v_i) of equation (2) is included as an additional regressor in equation (1), which is estimated by a probit model as follows:

$$DV = \beta_0 + \beta_1 \text{woman's working status} + \beta_2 \text{Characteristics} \\ \text{Husband/Wife} + \beta_3 \text{HH} - \text{Characteristics} + \beta_4 \text{Region} + \gamma \hat{v}_1 + \varepsilon_i \quad (3)$$

Testing the coefficient γ of \hat{v}_1 in equation (3) evaluates whether working status is indeed endogenous.⁷ A key issue in this estimation is the validity of the instruments. A valid instrument should fulfill two conditions: First, it should be strongly correlated with the endogenous variable. Second, it should be exogenous in the basic model. In the current case, there are a few potentially strong candidates that could serve as good instruments, for instance type and size of the family or currently pregnant. These variables are already used in other studies to instrument women's work status (Yoo-Mi Chin 2007; Bhattacharya, Bedi, and Chhachhi 2011). However, the results of appropriate tests indicate that in this case only the variable *cluster average of working status* constitutes a valid instrument. The variable is constructed in such a way that we always use the cluster average excluding the woman being considered in each observation to avoid an in-built correlation. The cluster average of working status has a strong impact on women's own employment status, but should not be directly correlated with husband's violent behavior, other than through its impact on women's own employment. Hence, the conditions necessary to be a valid instrument should be fulfilled in this case.

In the empirical analysis several specifications are estimated and the validity and strength of the instruments are tested.

DESCRIPTIVE STATISTICS AND VARIABLES

Descriptive statistics

According to the Jordan Population and Family Health Survey 2007, one in five ever-married Jordanian women reported that they ever experienced physical violence by their husband (Table 1). For 12 percent of women, this violence had occurred within the year before the survey. Eight percent of ever-married women report sexual violence by their husband. One

DOMESTIC VIOLENCE IN JORDAN

Table 1 Incidence of domestic violence in Jordan (%)

<i>Wife's age</i>	<i>Type of violence</i>			
	<i>Emotional</i>	<i>Physical</i>	<i>Sexual</i>	<i>Domestic violence</i>
15–29	14.91	16.98	7.31	25.14
30–39	19.05	19.63	8.49	28.86
40–49	20.07	18.54	8.35	30.55
Overall	17.79	18.49	8.07	28.11

Note: Sample size N = 2,283.

Table 2 Incidence of domestic violence by wife's working status in Jordan (%)

<i>Type of violence</i>	<i>Not working (wife's working status = 0)</i>	<i>Working (wife's working status = 1)</i>
Emotional violence	18.16	16.81
Physical violence	18.41	19.00
Sexual violence	8.14	7.64
Domestic violence	28.14	27.95

Note: Sample size N = 2,283.

in five women also reported to have experienced emotional violence by their husband. Overall, 28.1 percent of ever-married women reported ever having experienced emotional, physical or sexual violence by their husbands. These are large shares of women, particularly if one allows for the possibility of underestimation of domestic violence in such a survey setting.⁸

Women with lower levels of education and those living in poorer households are more likely to report domestic violence than women with more education or those living in wealthier households (Appendix Table 2). Table 2 shows that reports of physical, sexual, and emotional violence also vary by wife's working status; however, the differences are rather small. Around 19 percent of the women who were working reported being a victim of physical violence, compared to 18 percent of women who were not working. Domestic violence is also more common in situations where the husband is better educated than the wife and in households where the wife is significantly older or younger than her husband. Table 3 further reports lower rates of domestic violence for women who are living in a kinship marriage compared to those who are not married to a relative. These correlations are interesting, but of course do not necessarily imply a direction of causality.

Table 3 Incidence of domestic violence in Jordan by background characteristics (%)

<i>Variables</i>	<i>Type of violence</i>			
	<i>Emotional</i>	<i>Physical</i>	<i>Sexual</i>	<i>Domestic violence</i>
<i>Wife's education</i>				
0 years of schooling	26.74	25.63	13.37	37.33
1–6 years of schooling	19.36	21.63	8.48	31.31
6–12 years of schooling	17.10	14.72	6.93	24.46
12–18 years of schooling	12.97	12.76	6.02	21.47
<i>Husband's education</i>				
0 years of schooling	19.44	20.37	9.26	26.85
1–6 years of schooling	22.32	21.87	11.39	33.49
6–12 years of schooling	18.55	20.05	8.50	29.79
12–20 years of schooling	14.02	12.66	5.09	21.34
<i>Spousal age difference</i>				
Wife older	16.83	19.80	9.90	28.71
Wife is same age	13.20	17.26	5.08	24.37
Wife is 1–4 years younger	17.68	18.16	7.34	27.73
Wife is 5–9 years younger	17.46	17.14	8.49	27.08
Wife is 10 + years younger	21.41	21.73	8.82	31.86
<i>Wealth quintile</i>				
Lowest	20.89	22.49	9.25	31.96
Second	16.84	18.96	8.01	28.15
Middle	16.18	18.24	10.00	27.21
Fourth	17.38	14.58	5.42	25.23
Highest	17.78	13.70	5.54	24.49
<i>Kinship marriage</i>				
Kinship marriage = 0	19.66	20.56	8.35	29.82
Kinship marriage = 1	17.39	18.28	8.66	27.84
<i>Spousal education difference</i>				
Husband better educated	20.14	20.59	9.94	31.15
Wife better educated	17.71	18.96	8.23	29.02
Both equally educated	15.40	14.78	5.22	22.36

Note: Own calculations, sample size N = 2,283.

Independent variables

Wife's working status is a binary variable taking the value of 1 if the woman is engaged in paid work outside the home. If the variable takes the value 0, the woman is unemployed or works inside her home. Similarly, the variable for husband's employment takes the value 1 if he worked during the last twelve months. Since education might have a nonlinear effect on violence,

the squared term is included in the model as well. Since age of men and women shows a high correlation, the variable age difference between the two spouses is included in the model,⁹ also to indicate differences in bargaining power.¹⁰ Generated with the principal components analysis, the wealth index places individual households on a continuous scale of relative wealth. No further variables concerning the economic status of the household are available in the dataset. Household size reports the number of persons living in the household. The variable kinship marriage indicates if the wife is related to her current husband. The variable takes the value 1 if a woman is married to her first cousin, second cousin, or other relative. Moreover, *number of co-wives* represents a polygamous union and measures the number of other wives up to three as a continuous variable.

Location effects are measured by the variable urban and the capital city Amman. The latter is included in the regression in order to control for unobserved heterogeneity between urban and rural areas. Similarly, the Badia region is included separately as it involves different forms of cultural life and traditions than the rest of Jordan. Descriptive statistics on these variables are shown in Appendix Table 1.

Instrument

As the main instrument, we include cluster average of women's working status in the regression model. The DHS are divided into geographical units, so called "cluster" which are usually census enumeration areas or villages in rural areas (Department of Statistics of Jordan and ICF Macro 2010). By using the cluster average of working status, we capture the effects of the average employment rate in the vicinity of the woman on her own employment performance. This may proxy for employment opportunities for women in the area, unmeasured values and attitudes affecting women's employment, and network efforts enabling women to find employment.¹¹

ESTIMATION RESULTS

Linear probability model estimation

Table 4 presents the estimation results of equation (1), measuring the probability of a woman experiencing some kind of violence from her husband. Following the narrative provided in the earlier sections, the discussion focuses on the role of women's work status influencing the probability of experiencing violence. Most of the other variables have already been tested before in other studies on domestic violence (Vijayendra Rao 1997; Shireen Jejeebhoy 1998; Dallan F. Flake 2005; Pradeep Panda and Bina Agarwal 2005).

Table 4 reports in the first column the results of a linear probability model (LPM) of the aggregated domestic violence measure that does

Table 4 LPM of experiencing domestic violence

	(1)	(2)	(3)	(4)
	<i>Dep. var. = domestic violence</i>	<i>Dep. var. = emotional violence</i>	<i>Dep. var. = physical violence</i>	<i>Dep. var. = sexual violence</i>
<i>Variable</i>	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)
Intercept	0.249*** (0.0548)	0.221*** (0.0474)	0.116** (0.0488)	0.0710** (0.0359)
Working status	0.0755*** (0.0245)	0.0384* (0.0211)	0.0751*** (0.0213)	0.0167 (0.0157)
Husband's education	0.0220*** (0.00832)	0.0122* (0.00720)	0.0148** (0.00735)	0.00550 (0.00580)
Husband's education squared	− 0.00143*** (0.000416)	− 0.000804** (0.000355)	− 0.000898** (0.000364)	− 0.000380 (0.000278)
Husband employed	− 0.0401* (0.0222)	− 0.0264 (0.0190)	− 0.00273 (0.0191)	− 0.0164 (0.0145)
Wife's education	0.00244 (0.00738)	− 0.00166 (0.00651)	0.00448 (0.00659)	− 0.00556 (0.00527)
Wife's education squared	− 0.000632 (0.000402)	− 0.000387 (0.000350)	− 0.000656* (0.000348)	0.000186 (0.000276)
Age difference	0.00112 (0.00151)	0.000710 (0.00133)	0.000527 (0.00135)	0.000311 (0.00101)
Household size	0.00915*** (0.00334)	0.00133 (0.00279)	0.00963*** (0.00294)	0.00625*** (0.00225)
Wealth	− 1.11e-07 (1.08e-07)	4.01e-08 (9.46e-08)	− 3.09e-07*** (9.08e-08)	− 8.63e-08 (5.67e-08)
Urban	− 0.0326* (0.0180)	− 0.0150 (0.0152)	− 0.0297* (0.0154)	− 0.0132 (0.0108)
Badia region	− 0.0109 (0.0251)	− 0.0149 (0.0214)	− 0.00120 (0.0221)	0.0152 (0.0160)
Amman	0.0738***	0.0853***	0.0549**	0.0123
Number of co-wives	0.133*** (0.0383) (0.0257)	0.145*** (0.0363) (0.0234)	0.124*** (0.0366) (0.0226)	0.0691** (0.0287) (0.0153)
Kinship marriage	− 0.0264* (0.0159)	− 0.0261* (0.0135)	− 0.0279** (0.0136)	0.00414 (0.00972)
R^2	0.033	0.030	0.033	0.017
Number of observations	3,283	3,283	3,283	3,283

Notes: Robust standard errors in parentheses. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. LPM coefficients are shown in columns 1–4. However, probit regression models yield similar results.

Source: Department of Statistics of Jordan and ICF Macro (2007).

not consider the endogeneity of women's work status. It shows that women's labor force participation has a small, but significant positive effect on the probability of spousal violence. If a woman is involved in paid work, the probability of spousal violence increases by 0.076, or 7.6 percent (statistically significant at the 1 percent level), holding everything else constant. This result would seem to support the *Male-backlash theory* (Bhattacharya, Bedi, and Chhachhi 2011).¹²

An increase in husband's education has a nonlinear effect on domestic violence. At low levels of education, the incidence of violence increases, while at high levels, it decreases with the turning point being at about eight years of education.¹³

Husband's employment status has a significant negative impact on violent behavior suggesting that regular employment decreases stress and frustration. The age difference between the spouses is positively linked to violence, but the effect is not statistically significant. Household size also displays a positive effect on violence, statistically significant at the 1 percent significance level. Consistent with expectations, wealth, reflecting the economic status of the household, reduces violence, as poor households are more prone to violence since the lack of financial resources might cause economic stress.

In order to shed light on whether the coefficients differ significantly for different types of the dependent variable, *domestic violence*, we further report in Table 4 (columns 2–4) the probability of a woman experiencing emotional, physical, and sexual violence. The estimated regressions deliver similar results regarding the sign and magnitude of the main covariates in column (1). However, the coefficient of working status is not statistically significant for sexual violence; thus the overall results appear to be driven by the correlation between work status and the likelihood of experiencing physical and emotional violence. Moreover, husband's education, up to eight years, appears to have an enhancing effect on the incidence of all three types of violence and a protective effect beyond eight years; yet, again, this is not significant for the incidence of sexual violence. The coefficients of husband's employment status and age difference show signs similar to the main specification in column (1), however, none of them are statistically significant. All of these results have not considered the potential endogeneity of women's work.

The overall fit of the main regression model in column (1) has a likelihood ratio of 57.44 and a p -value of 0.00, both indicating that the model is significant as a whole, compared to a model that includes only the constant. The R^2 of 0.03 is quite low; however, R^2 is generally not considered as an accurate measure of overall fit in the case of a linear probability model (Arnold H. Studenmund 2011). A further test diagnostic, the "percent correctly predicted" of the model, reports an overall correct prediction rate of 75.5 percent, R^2 suggesting that we are able to account

for the key drivers of reported domestic violence reasonably well. But as the regression results might be inconsistent in the presence of endogeneity bias, we focus in the next section on the IV estimates in Table 5 for a more detailed interpretation of the coefficients.

Instrumental variable estimation

As discussed previously, the variable women's working status is instrumented with the variable cluster average of women's working status in the baseline-IV regression model in Table 5.

The instrument *cluster average of working status* is expected to have a significant impact on women's employment status but is independent of husband's violent behavior as it largely reflects local labor market conditions for women and attitudes toward women's employment that are unlikely to directly affect male violence. Thus, we consider the cluster average as a suitable instrument for women's working status.

The first stage of the IV estimation at the bottom of Table 5 indicates that, as expected, the cluster average of working status increases the probability that the woman works. This effect is statistically significant at the 1 percent level. A 1-unit increase in the variable cluster average increases the probability of the women working by 0.14, or 14 percent, holding everything else constant. In the second stage of the IV estimation, shown in Table 5 column (1), the coefficient of work status now turns out to have a negative but highly insignificant effect on violence, with the point estimate being relatively close to 0. Thus, the variable work status appears to have no causal effect on violence, in contrast to the basic model that did not consider endogeneity. This result suggests that the positive relationship between violence and woman's employment in the basic model is likely to be driven by omitted variables or reverse causality, rather than by male backlash.¹⁴

This result is confirmed in column (1) of Table 6, where we report the results of the 2SRI model. The marginal effects in the second stage show that work status is not significantly associated with the probability of domestic violence; this statistical insignificance is mostly due to a very small coefficient, which is close to 0 (rather than due to a particularly large standard error) suggesting that there really is no relationship between the two variables.¹⁵

Similarly, wife's education level is not related to the incidence of violence in the second stage of the IV estimation reported in Table 5. Similar to the linear probability model in Table 4 husband's education exerts a nonlinear effect on the prevalence of domestic violence, statistically significant at the 5 percent significance level. The measure of differences in empowerment between the spouses, *age difference*, shows the expected positive direction of the effect, but is again not statistically significant. A higher number

DOMESTIC VIOLENCE IN JORDAN

Table 5 2SLS – Probability of experiencing domestic violence, instrumental variable estimation: second stage estimates

	(1)	(2)	(3)	(4)
	<i>Dep.</i> <i>var. = domestic</i> <i>violence</i>	<i>Dep.</i> <i>var. = emotional</i> <i>violence</i>	<i>Dep.</i> <i>var. = physical</i> <i>violence</i>	<i>Dep.</i> <i>var. = sexual</i> <i>violence</i>
<i>Variable</i>	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)
Intercept	0.278*** (0.0951)	0.235*** (0.0811)	0.106 (0.0817)	0.146** (0.0637)
Working status	− 0.0808 (0.423)	− 0.0391 (0.360)	0.132 (0.363)	− 0.388 (0.283)
Husband's education	0.0208** (0.00876)	0.0116 (0.00747)	0.0152** (0.00753)	0.00244 (0.00587)
Husband's education squared	− 0.00137*** (0.000448)	− 0.000775** (0.000382)	− 0.000920** (0.000385)	− 0.000225 (0.000300)
Husband employed	− 0.0466* (0.0278)	− 0.0297 (0.0237)	− 0.000343 (0.0239)	− 0.0334* (0.0186)
Wife's education	− 0.00553 (0.0226)	− 0.00561 (0.0193)	0.00739 (0.0195)	− 0.0262* (0.0152)
Wife's education squared	7.39e-05 (0.00195)	− 3.65e-05 (0.00166)	− 0.000914 (0.00167)	0.00202 (0.00130)
Age difference	0.000576 (0.00208)	0.000440 (0.00178)	0.000725 (0.00179)	− 0.00110 (0.00140)
Household size	0.00901*** (0.00331)	0.00127 (0.00282)	0.00968*** (0.00285)	0.00590*** (0.00222)
Wealth	− 7.14e-08 (1.52e-07)	5.96e-08 (1.29e-07)	− 3.23e-07** (1.30e-07)	1.54e-08 (1.02e-07)
Urban	− 0.0297 (0.0201)	− 0.0135 (0.0171)	− 0.0308* (0.0172)	− 0.00564 (0.0134)
Badia region	− 0.00896 (0.0255)	− 0.0139 (0.0218)	− 0.00191 (0.0219)	0.0203 (0.0171)
Amman	0.0670** (0.0310)	0.0819*** (0.0264)	0.0574** (0.0266)	− 0.00537 (0.0207)
Number of co-wives	0.141*** (0.0414)	0.149*** (0.0353)	0.121*** (0.0356)	0.0902*** (0.0277)
Kinship marriage	− 0.0265* (0.0160)	− 0.0262* (0.0137)	− 0.0279** (0.0138)	0.00383 (0.0107)

(Continued).

Table 5 Continued

	(1)	(2)	(3)	(4)
	<i>Dep.</i> <i>var. = domestic</i> <i>violence</i>	<i>Dep.</i> <i>var. = emotional</i> <i>violence</i>	<i>Dep.</i> <i>var. = physical</i> <i>violence</i>	<i>Dep.</i> <i>var. = sexual</i> <i>violence</i>
<i>Variable</i>	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)	<i>coeff.</i> (<i>S.E.</i>)
R^2	0.022	0.026	0.031	0.028
Number of observations	3,283	3,283	3,283	3,283
<i>First-stage results-instrument</i>				
F-test of joint significance	11.58	11.58	11.58	11.58
<i>Cluster average working status</i>	0.140*** (0.0413)	0.140*** (0.0413)	0.140*** (0.0413)	0.140*** (0.0413)

Notes: Robust standard errors in parentheses. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The coefficients of *cluster average working status* don't change in the first-stage, as the sample size remains the same for all regressions. The first stage additionally includes all covariates included in the second stage. Full first-stage results are available on request.

Source: Department of Statistics of Jordan and ICF Macro (2007).

of household members increases the incidence of violence, statistically significant at the 1 percent significance level. This estimation result is consistent with the idea that more people in the household cause more social stress, as is found in several other studies (Rachel Jewkes, Jonathan Levin, and Loveday Penn-Kekana 2002; Abdus Salam, Abdul Alim, and Toshikuni Noguchi 2006).

The economic status of the household, proxied by the wealth index, displays the expected sign but is again not significantly associated with husband's violent behavior.

Both indicators for urban regions, *Urban* and *Amman*, show opposite signs regarding the incidence of violence. Yet, the coefficient of urban turns out to be insignificant as compared to the baseline regression in Table 4 column (1). The variable *Amman* has a positive sign, going against the empirical literature that suggests a negative link between urban areas and domestic violence. This result may be driven by the fact that flight from the countryside leads to a higher population share of traditional and rural families in the capital. Urban living, especially for migrants, is stressful as compared to rural environments and the move from rural areas might have triggered poor coping mechanisms (Mohannad Al-Nsour, Marwan Khawaja, and Ghadah Al-Kayyali 2009). Moreover, *Amman* appears as a modern urban area, albeit it shows distinct traditional and informal

characteristics at the local or micro level (Nabil I. Abu-Dayyeh 2004). Therefore, increased violence could also point to tensions and clashes of values and attitudes associated with urban living, often in cramped living quarters. The negative, but insignificant, sign of Badia region might reflect the social system in rural areas which is largely based on tribalism, leading to higher social control and sanctions against spousal violence (Jennifer Rowland 2009).

The coefficient of *number of co-wives* has a positive sign suggesting that women experience more violence if they live in polygynous marriages. This is consistent with some other theoretical and empirical models. For

Table 6 2SRI – domestic violence separated by each type of violence (emotional, physical, or sexual)

	(1)	(2)	(3)	(4)
	<i>Probit</i>			
	<i>Dep.</i> <i>var. = domestic</i> <i>violence</i>	<i>Dep.</i> <i>var. = emotional</i> <i>violence</i>	<i>Dep.</i> <i>var. = physical</i> <i>violence</i>	<i>Dep.</i> <i>var. = sexual</i> <i>violence</i>
<i>Variable</i>	<i>Marginal effects</i> (S.E.)	<i>Marginal effects</i> (S.E.)	<i>Marginal effects</i> (S.E.)	<i>Marginal effects</i> (S.E.)
Wife's working status	0.0110 (0.199)	0.00814 (0.172)	0.0733 (0.172)	− 0.253** (0.120)
Husband's education	0.0216*** (0.00836)	0.0116* (0.00700)	0.0155** (0.00725)	0.00350 (0.00509)
Husband's education squared	− 0.00144*** (0.000432)	− 0.000792** (0.000362)	− 0.000964** (0.000380)	− 0.000302 (0.000267)
Husband employed	− 0.0402* (0.0224)	− 0.0247 (0.0189)	− 0.00151 (0.0193)	− 0.0253* (0.0132)
Wife's education	0.00134 (0.0108)	− 0.00104 (0.00912)	0.00648 (0.00914)	− 0.0141** (0.00632)
Wife's education squared	− 0.000479 (0.000859)	− 0.000377 (0.000734)	− 0.000786 (0.000730)	0.00109** (0.000511)
Age difference	0.000835 (0.00160)	0.000514 (0.00134)	0.000543 (0.00138)	− 0.000658 (0.000974)
Household size	0.00880*** (0.00321)	0.00112 (0.00273)	0.00931*** (0.00271)	0.00515*** (0.00187)
Wealth	− 9.32e-08 (1.20e-07)	5.09e-08 (1.02e-07)	− 3.22e-07*** (1.06e-07)	− 3.06e-08 (6.77e-08)

(Continued).

Table 6 Continued

	(1)	(2)	(3)	(4)
	<i>Probit</i>			
	<i>Dep. var. = domestic violence</i>	<i>Dep. var. = emotional violence</i>	<i>Dep. var. = physical violence</i>	<i>Dep. var. = sexual violence</i>
<i>Variable</i>	<i>Marginal effects (S.E.)</i>	<i>Marginal effects (S.E.)</i>	<i>Marginal effects (S.E.)</i>	<i>Marginal effects (S.E.)</i>
Urban	− 0.0319* (0.0186)	− 0.0153 (0.0159)	− 0.0304* (0.0159)	− 0.00902 (0.0111)
Badia region	− 0.00904 (0.0246)	− 0.0131 (0.0209)	− 0.00128 (0.0207)	0.0161 (0.0139)
Amman	0.0682*** (0.0255)	0.0762*** (0.0209)	0.0531** (0.0222)	0.00101 (0.0155)
Number of co-wives	0.121*** (0.0350)	0.117*** (0.0284)	0.0999*** (0.0294)	0.0657*** (0.0197)
Kinship marriage	− 0.0271* (0.0159)	− 0.0266* (0.0137)	− 0.0291** (0.0137)	0.00259 (0.00956)
Residual	0.0339* (0.0116)	0.0416* (0.0278)	0.258** (0.107)	0.737** (0.325)
Number of observations (N)	3,283	3,283	3,283	3,283
Pseudo R^2	0.028	0.029	0.036	0.031
<i>First-stage results- instrument</i>				
<i>Cluster average working status</i>	0.112*** (0.0373)	0.112*** (0.0373)	0.112*** (0.0373)	0.112*** (0.0373)

Notes: Bootstrapped standard errors in parentheses. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. The coefficients of *cluster average working status* do not change in the first stage, as the sample size remains the same for all regressions. The first stage additionally includes all covariates included in the second stage. Full first-stage results are available on request.

Source: Department of Statistics of Jordan and ICF Macro (2007).

example, Dena Hassounah-Phillips (2001) finds that women of polygynous marriages experience higher levels of emotional, physical, and sexual abuse relative to women of monogamous marriages. Violent behavior is often used by a husband as a source of controlling wives within the marriage. The addition of wives causes significant stress as it constitutes a change in family and economic structure (Alean Al-Krenawi 1999; Hassounah-Phillips 2001). The first wife is forced to share existing resources with the new families of the husband and competition is most fierce around a husband's investment in health, education, and other expenditures on their children (Caroline

H. Bledsoe 1993; Al-Krenawi 1999). Further empirical support is given by a cross-sectional study in South Africa, finding that polygyny is associated with higher rates of domestic physical and sexual abuse (Jewkes, Levin, and Penn-Kekana 2002).

Consanguinity marriages could be a relevant factor as they are relatively common in Jordan with 43 percent of marriages taking place between relatives (mostly first or second cousins; Department of Statistics of Jordan and ICF Macro 2010). The coefficient of kinship marriages appears to have a negative and significant effect on violence. According to Atkinson, Greenstein, and Lang (2005)'s Gendered Resource Theory, a more traditional ideology is accompanied with a higher probability of violence. The negative relation of violence and traditionalism in this model might, however, reflect higher family control and sanctions facing the husband in case of violence toward his wife (Gerald Erchak 1984; Dorothy Counts, Judith K. Brown, and Jacquelyn Campbell 1999). Empirical evidence is given by Jonathan Stieglitz, Hillard Kaplan, Michael Gurven, Jeffrey Winking, and Basilio Vie Tayo (2011), who found a negative impact of kinship marriage on marital violence due to the principle of deterrence and control of the family.

We now turn to the IV regression results separated by each type of domestic violence. Few studies examine the risk factors for different types of domestic violence independently. Inconsistencies in the definitions used in research, particularly with regard to inclusion or exclusion of sexual and emotional abuse by male intimate partners, has resulted in most studies on the causes of intimate partner violence focusing solely on physical violence (Rachel Jewkes 2001). However, a small strand of literature investigates specifically the incidence of sexual violence irrespective of physical violence (Jewkes 2001; Naeemah Abrahams, Rachel Jewkes, Margaret Hoffman, and Ria Laubsher 2004).

Consistent with results of the baseline IV regression in column (1), none of the coefficients of *working status* is significant at conventional significance levels. One should note, however, that the impact of working status on sexual violence is negative, empirically sizable, and approaches statistical significance at conventional levels.

Husband's education has a nonlinear and significant impact on physical violence while the coefficients for emotional and sexual violence are not significant at conventional significance levels. One possible explanation for the difference in effects is given in Lori L. Heise's conceptual framework (1998). Factors operating at the societal or community level or such as cultural norms or attitudes on how more educated men should behave in a more controlled manner in public, may condition such men against physically and emotionally abusing their wives. However, entitlement over his wife's body remains a man's marital privilege (Vivian F. Go, Johnson Sethulakshmi, Margaret E. Bentley, Sudha Sivaram, Aylur K. Srikrishnan,

Suniti Solomon, and David D. Celentano 2003), being the only domain where they control their wives. This might be a likely explanation of finding educational attainment to be independent of sexual violence.

Surprisingly, wife's education decreases the incidence of sexual violence while not being associated with the prevalence of emotional and physical violence.¹⁶ Other studies find a protective effect on sexual violence as well, specifically in patrilinear societies (Naomi Abrahams 2001; Gurvinder Kalra and Dinesh Bughra 2013). Yet, according to a World Health Organization (WHO; 2010) recent study it is not known whether the U-shape relationship as found between education and physical violence is also the case for sexual violence.

Moreover, the negative impact of wealth, the economic status of the household in Table 5 is primarily related to physical violence, as none of the coefficients for emotional and sexual violence are significant. The variable capturing the differences in bargaining power between the spouses, *age difference*, is not significant for any type of violence, as is the case for the aggregated domestic violence results in column (1).

The prevalence of emotional and physical violence appears to be higher among households with more co-wives. Research on co-wife relationships in polygynous families find the relationships to be emotionally unsatisfactory for the majority of participants, which often leads to a response in spouse's behavior in terms of increased emotional and physical violence (James S. Chisholm and Victoria K. Burbank 1991; Al-Krenawi 1999; Alean Al-Krenawi and John R. Graham 1999).

The negative relationship between violence and traditionalism in this model, as reported by the negative coefficient of *kinship marriage*, might reflect higher family control and sanctions facing the husband in cases of violence toward his wife in the case of emotional and physical violence (Erchak 1984; Counts, Brown, and Campbell 1999). However, as entitlement over a women's body is the primary domain of the husband, social control through family might not take effect in the case of sexual violence (Karuna S. Chibber, Karl Krupp, Nancy Padian, and Purnima Madhivanan 2012).

Overall, further research is required to examine the overlap in different types of domestic violence and disentangle the differences in risk factors. In this study, the co-occurrence is quite low, as only 10.6 percent reported to experience both sexual and physical violence at the same time, which further emphasizes the need for more in-depth research in terms of differences in risk factors.

To support these estimation results, formal tests are implemented to analyze the validity and strength of the instrument. The predictive power or relevance of the instruments is tested via the *F*-statistics for joint significance of the instruments in the first stage regressions. The *F*-statistic records a value of 11.58, which indicates a strong correlation of

the instrument with women's work status. According to James H. Stock, Jonathan H. Wright, and Motohiro Yogo (2002), the F -statistic should be higher than 10 for the instruments to be truly valid. Moreover, the strength of the instrument is tested by the weak instrument robust test of Keith Finlay and Leandro M. Magnusson (2009). The confidence intervals of the weak-instrument robust test are significantly smaller than the confidence intervals of the Wald test, indicating that the instrument is strongly correlated with the endogenous regressor. Based on these tests and the theoretical justification, cluster average of working status appears to be a valid instrument.

In order to test the robustness of the results to possible estimation problems of using linear probability models in our IV estimation, we also estimate the IV regressions using a 2SRI estimation. The results, shown in Table 6, confirm our findings from the two-stage least-squares linear probability estimations. If endogeneity is not considered, the working status of the wife appears to increase domestic violence.¹⁷ In the IV model, cluster average of working status appears as a valid instrument and the work status of the wife is no longer significant. Moreover, the coefficients of the first-stage residuals, which capture the remaining variance in working status not explained by the instruments considered, are positive and statistically significant in all specifications on domestic violence. Thus, the null hypothesis of exogeneity of working status in equation (1) can be rejected in all cases, implying that a standard LPM is not consistent.

But note that we find that working status now has a statistically significant negative impact on sexual violence when using the residual inclusion method, while no such effect is found for physical and emotional violence. We interpret this as weak evidence suggesting that working status generates a protective effect reducing sexual violence.

We also experimented with various interaction terms to see whether the impact of paid work depends on women's education, men's education, men's employment, or kinship marriage (as suggested in some of the literature discussed above); yet, none turned out to be significant, so that we do not find an effect of women's paid work on domestic violence that is conditioned by other factors.

CONCLUSION

Using a representative national household survey, we explore the link between women's paid work and spousal violence in Jordan. Once we control for endogeneity, there is no significant impact of wife's employment status on domestic violence. When we disaggregate domestic violence into different types of violence, these results hold for emotional and physical violence. Moreover, we find a weak protective effect of women's employment status on sexual violence in some specifications.

Thus, the hypothesis of Vyas and Watts (2009), stating that women entering the labor market in regions where it is not common for women to work outside their home are more prone to violence due to their “pioneer role,” cannot be confirmed.

The weak protective effect of employment on sexual violence gives support for theories that predict an increase in women’s bargaining power through their engagement in paid work. The results have further consequences, suggesting that policies addressing job opportunities in the labor market for women in order to reduce violence as advocated recently (United Nations 2013) may be successful in Jordan at least for sexual violence. As discussed in World Bank (2014), supportive policies (including education and training programs and policies promoting safety and security) are needed to ensure that women’s employment reduces domestic violence. The main protective factors against domestic violence in Jordan are husband’s education and employment status. These findings demonstrate that the World Bank policies mentioned above should also promote men’s education in Jordan.

This study showed that it is important to control for unobserved factors and reverse causality. Estimates that do not account for the possibility of both reverse causality and omitted variables are more likely to draw the conclusion that women’s work status is indeed associated with an increased incidence of violence.

These results are surely not the last word on this important and difficult subject. Data concerning domestic violence suffer from underreporting and may cause measurement errors. The insignificant effect of employment might arise due to the difficulty of grasping the subject of violence, as well as the different levels at which factors might operate. Data limitations do not allow to take into account factors at the community level, such as weak community sanctions against domestic violence or social norms that restrict women’s public visibility (Lori L. Heise and Claudia Garcia Moreno 2002). Possibilities for further research include tackling the remaining methodological issues and distinguishing between different forms of domestic violence.

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NOTES

- ¹ Incidentally, this is also the implicit position taken by the summary document of the Committee on the Status of Women that sees women’s economic empowerment as a critical means to reduce domestic violence (United Nations 2013).
- ² It is unclear whether this instrument satisfies the exclusion restriction, as there might be caste-related norms that affect domestic violence directly.
- ³ It turns out that the predicted probabilities of domestic violence from the main specification all lie in the interval (0.017, 0.609) and thus, a linear probability model is expected to yield consistent estimates. Moreover, we also estimate a probit model to check for the robustness of the results and found them to be virtually identical. Results are available on request.
- ⁴ For example, one may argue that in these traditional families, gender roles are clearly delineated with each “knowing their place,” leading to less conflict and violence. This absence of violence would not mean that there is no inequality, but could be a result of both partners accepting the unequal family situation.
- ⁵ Angrist and Pischke (2009) show that linear probability models (LPM) are a good option for different kinds of limited dependent variables.
- ⁶ This method was first suggested by Jerry Hausman (1987). Consistent 2SRI methods for nonlinear models have been developed by Richard W. Blundell and Richard J. Smith (1989) or Whitney K. Newey (1987).

- ⁷ The coefficient of \hat{u}_1 is significant at the 5 percent level and thus, the null hypothesis of exogeneity of working status in equation (1) can be rejected. Therefore, using standard LPM regression models is not appropriate.
- ⁸ These shares are close to the rates reported by the World Bank (2014) for the Middle East as a whole of 40 percent.
- ⁹ The variable age difference is modeled by subtracting wife's age from husband's age. We also included wife's age as an additional control variable to the regression model, but the coefficient has no effect and is not statistically significant.
- ¹⁰ The variance inflation factor (VIF) significantly decreases from 3.42 (husband's age) and 3.23 (wife's age) to 1.21 (age difference) demonstrating that age difference indeed reduces the problem of collinearity.
- ¹¹ In a robustness check, we also add the presence of children under age 3 as an additional instrument that has been found in the literature to affect women's employment (Martin Browning 1992; Raquel Carrasco 2001).
- ¹² We also added wife's age as a control variable to the regression model in order to test whether the effects vary over different stages of a woman's life, but none of the regression results changed significantly.
- ¹³ According to the DHS report, ten years of education correspond to incomplete secondary education, and twelve years of education correspond to complete secondary education.
- ¹⁴ When we include children under age 3 as an additional instrument, the results are the same. With the two instruments, we are able to perform an over identification restriction test, which is passed. Results are available on request.
- ¹⁵ The coefficient of the first stage-residual added to the second stage is significant at the 5 percent significance level, indicating that *working status* is indeed endogenous.
- ¹⁶ The *F*-test of joint significance of both the linear and the squared term fails to reject the null hypothesis that both coefficients are significantly different from 0. Thus, we expect the effect of wife's education to be linear.
- ¹⁷ In the specification of sexual violence, the coefficient of work status is not significant.

REFERENCES

- Abrahams, Naomi. 2001. "Intimate Violence." In *Peace, Conflict, and Violence: Peace Psychology for the Twenty-First Century*, edited by Daniel J. Christie, Richard V. Wagner, and Deborah Du Nann Winter, 19–27. Englewood Cliffs, NJ: Prentice Hall.
- Abrahams, Naemah, Rachel Jewkes, Margaret Hoffman, and Ria Laubsher. 2004. "Sexual Violence Against Intimate Partners in Cape Town: Prevalence and Risk Factors Reported by Men." *Bulletin of the World Health Organization* 82(5): 330–7.
- Abu-Dayyeh, Nabil I. 2004. "Persistent Vision: Plans for a Modern Arab Capital, Amman, 1955–2002." *Planning Perspectives* 19(1): 79–110.
- Aizer, Anna. 2007. "Wages, Violence, and Health in the Household." Working Paper 13494, National Bureau of Economic Research Working Paper Series.
- Al-Krenawi, Alean. 1999. "Women of Polygamous Marriages in Primary Health Care Centers." *Contemporary Family Therapy* 21(3): 417–30.
- Al-Krenawi, Alean and John R. Graham. 1999. "The Story of Bedouin-Arab Women in a Polygamous Marriage." *Women's Studies International Forum* 22(5): 497–509.
- Al-Nsour, Mohannad, Marwan Khawaja, and Ghadah Al-Kayyali. 2009. "Domestic Violence against Women in Jordan: Evidence from Health Clinics." *Journal of Family Violence* 24(8): 569–75.
- Angrist, Joshua D. and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton, NJ: Princeton University Press.

- Atkinson, Maxine P., Theodore N. Greenstein, and Molly Monahan Lang. 2005. "For Women, Breadwinning Can Be Dangerous: Gendered Resource Theory and Wife Abuse." *Journal of Marriage and Family* 67(5): 1137–48.
- Bhattacharya, Haimanti. 2015. "Spousal Violence and Women's Employment in India." *Feminist Economics* 21(2): 30–52.
- Bhattacharya, Manasi, Arjun S. Bedi, and Amrita Chhachhi. 2011. "Marital Violence and Women's Employment and Property Status: Evidence from North Indian Villages." *World Development* 39(9): 1676–89.
- Bledsoe, Caroline H. 1993. "The Politics of Polygyny in Mende Education and Child Fosterage Transactions." In *Sex and Gender Hierarchies*, edited by Barbara Diane Miller, 170–92. Cambridge: Cambridge University Press.
- Bloch, Francis and Vijayendra Rao. 2002. "Terror as a Bargaining Instrument: A Case Study of Dowry Violence in Rural India." *American Economic Review* 92(4): 1029–43.
- Blundell, Richard W. and Richard J. Smith. 1989. "Estimation in a Class of Simultaneous Equation Limited Dependent Variable Models." *Review of Economics Studies* 56(1): 37–57.
- Browning, Martin. 1992. "Children and Household Economic Behavior." *Journal of Economic Literature* 30(3): 1434–75.
- Carrasco, Raquel. 2001. "Binary Choice with Binary Endogenous Regressors in Panel Data: Estimating the Effect of Fertility on Female Labor Participation." *Journal of Business and Economic Statistics* 19(4): 385–94.
- Chibber, Karuna S., Karl Krupp, Nancy Padian, and Purnima Madhivanan. 2012. "Examining the Determinants of Sexual Violence Amongst Young, Married Women in Southern India." *Journal of Interpersonal Violence* 27(12): 2465–83.
- Chin, Yoo-Mi. 2007. "Male Backlash, Bargaining, or Exposure Reduction?: Women's Working Status and Physical Spousal Violence in India." *Journal of Population Economics* 25(1): 175–200.
- Chisholm, James S. and Victoria K. Burbank. 1991. "Monogamy and Polygyny in Southeast Arnhem Land: Male Coercion and Female Choice." *Ethnology and Sociobiology* 12(4): 291–313.
- Counts, Dorothy, Judith K. Brown, and Jacquelyn Campbell. 1999. *To Have and to Hit: Cultural Perspectives on Wife Beating*. 2nd ed. Urbana: University of Illinois Press.
- Department of Statistics of Jordan and ICF Macro. 2007. *Jordan Demographic and Health Survey/Population and Family Health Survey 2007*. Ref JOR_2007_DHS_v01_M. Dataset. www.measuredhs.com.
- . 2010. *Jordan Population and Family Health Survey 2009*. Calverton, MD: Department of Statistics and ICF Macro.
- Economic and Social Council. 2008. "Female Labor Force Participation in Jordan." Policy Paper, Economic and Social Council (ECOSOC), Amman, Jordan.
- Erchak, Gerald. 1984. "Cultural Anthropology and Spouse Abuse." *Current Anthropology* 25(3): 331–2.
- Esteve-Volart, Berta. 2004. "Gender Discrimination and Growth: Theory and Evidence from India." Suntory and Toyota International Centres for Economics and Related Disciplines (STICERD) Discussion Paper 42, Development Economics Discussion Paper Series, London School of Economics, London, UK.
- Farmer, Amy and Jill Tiefenthaler. 1996. "Domestic Violence: The Value of Services as Signals." *American Economic Review* 86(2): 274–79.
- Finlay, Keith and Leandro M. Magnussen. 2009. "Implementing Weak Instrument Robust Tests for a General Class of Instrumental Variables Models." Working Paper 0901, Tulane Economics Working Paper Series New Orleans, LA.

- Flake, Dallan F. 2005. "Individual, Family, and Community Risk Markers for Domestic Violence in Peru." *Violence Against Women* 11(3): 353–73.
- Gaddis, Isis and Stephan Klasen. 2014. "Economic Development, Structural Change, and Female Labor Force Participation: A Reexamination of the Feminization U-Hypothesis." *Journal of Population Economics* 27(3): 639–81.
- Gelles, Richard J. 1997. *Intimate Violence in Families*. Thousand Oaks, CA: SAGE.
- Go, Vivian F., Johnson Sethulakshmi, Margaret E. Bentley, Sudha Sivaram, Aylur K. Srikrishnan, Suniti Solomon, and David D. Celentano. 2003. "When HIV-Prevention Messages and Gender Norms Clash: The Impact of Domestic Violence on Women's HIV Risk in Slums of Chennai, India." *AIDS and Behavior* 7(3): 263–72.
- Hassouneh-Phillips, Dena. 2001. "Polygamy and Wife Abuse: A Qualitative Study of Muslim Women in America." *Health Care for Women International* 22(8): 736–48.
- Hausman, Jerry. 1987. "Specification Tests in Econometrics." *Econometrica* 46(6): 1251–71.
- Heise, Lori L. 1998. "Violence Against Women: An Integrated, Ecological Framework." *Violence Against Women* 4(3): 262–90.
- Heise, Lori L. and Claudia Garcia-Moreno. 2002. "Violence by Intimate Partners." In *World Report on Violence and Health*, edited by Etienne G. Krug, Linda L. Dahlberg, James A. Mercy, Anthony B. Zwi, and Rafael Lozano, 87–122. Geneva: World Health Organization.
- Horrace, William C. and Ronald L. Oaxaca. 2006. "Results on the Bias and Inconsistencies of Ordinary Least Squares for the Linear Probability Model." *Economics Letters* 90(3): 321–27.
- Jejeebhoy, Shireen. 1998. "Associations Between Wife-Beating and Fetal and Infant Death: Impressions from a Survey in Rural India." *Studies in Family Planning* 29(3): 300–8.
- Jewkes, Rachel. 2001. "Reflections on Gender Violence in the South African Public Health Agenda." *Development* 44(3): 64–68.
- Jewkes, Rachel, Jonathan Levin, and Loveday Penn-Kekana. 2002. "Risk Factors for Domestic Violence: Findings from a South African Cross-Sectional Study." *Social Science and Medicine* 55(9): 1603–17.
- Johnson, Michael P. 1995. "Patriarchal Terrorism and Common Couple Violence: Two Forms of Violence Against Women." *Journal of Marriage and the Family* 57(2): 283–94.
- Kalra, Gurvinder and Dinesh Bhugra. 2013. *Indian Journal of Psychiatry* 55(3): 244–9.
- Kishor, Sunita and Kiersten Johnson. 2004. *Profiling Domestic Violence: A Multi-Country Study*. Calverton, MD: ORC Macro. dhsprogram.com/pubs/pdf/od31/od31.pdf.
- Klasen, Stephan and Francesca Lamanna. 2009. "The Impact of Gender Inequality in Education and Employment on Economic Growth: New Evidence for a Panel of Countries." *Feminist Economics* 15(3): 91–132.
- Klasen, Stephan and Claudia Wink. 2003. "'Missing Women': Revisiting the Debate." *Feminist Economics* 9(2/3): 263–99.
- Lloyd, Susan. 1997. "The Effects of Domestic Violence on Women's Employment." *Law and Policy* 19(2): 139–67.
- Macmillan, Ross and Rosemary Gartner. 1999. "When She Brings Home the Bacon: Labor Force Participation and the Risk of Domestic Violence against Women." *Journal of Marriage and Family* 61(4): 947–58.
- Miguel, Edward, Shanker Satyanath, and Ernest Sergenti. 2004. "Economic Shocks and Civil Conflict: An Instrumental Variables Approach." *Journal of Political Economy* 112(4): 725–53.
- Morrison, Andrew R. and María B. Orlando. 1999. "Social and Economic Costs of Domestic Violence: Chile and Nicaragua." In *Too Close to Home: Domestic Violence in*

- the Americas*, edited by Andrew R. Morrison and Maria Loreto Biehl, 51–80. New York: Inter-American Development Bank.
- Murthi, Mamta, Anne-Catherine Guio, and Jean Drèze. 1995. "Mortality, Fertility, and Gender Bias in India: A District-Level Analysis." *Population and Development Review* 21(4): 745–82.
- Narayan, Deepa, Robert Chambers, Meera K. Shah, and Patti Petesch. 2000. "Gender Relations in Troubled Transition." In *Voices of the Poor: Crying out for Change*, edited by Deepa Narayan, Robert Chambers, Meera K. Shah, and Patti Petesch, 109–32. New York: Oxford University Press.
- Newey, Whitney K. 1987. "Efficient Estimation of Limited Dependent Variable Models with Endogenous Explanatory Variables." *Journal of Econometrics* 36(3): 231–50.
- Panda, Pradeep and Bina Agarwal. 2005. "Marital Violence, Human Development, and Women's Property Status in India." *World Development* 33(5): 823–50.
- Rao, Vijayendra. 1997. "Wife-Beating in Rural India: A Qualitative and Econometric Analysis." *Social Science and Medicine* 44(8): 1169–80.
- Riger, Stephanie, Courtney E. Ahrens, and Amy Blickenstaff. 2000. "Measuring Interference with Employment and Education Reported by Women with Abusive Partners: Preliminary Data." *Violence and Victims* 15(2): 161–72.
- Rowland, Jennifer. 2009. "Democracy and the Tribal System in Jordan: Tribalism as a Vehicle for Social Change." Independent Study Project (ISP) Collection Paper 749, Washington, DC.
- Salam, Abdus, Abdul Alim, and Toshikuni Noguchi. 2006. "Spousal Abuse against Women and Its Consequences on Reproductive Health: A Study in the Urban Slums in Bangladesh." *Maternal and Child Health Journal* 10(1): 83–94.
- Sen, Amartya. 1999. *Development as Freedom*. New York: Oxford University Press.
- Sonbol, Amira El Azhary. 2003. *Women of Jordan: Islam, Labor, and the Law*. Syracuse, NY: Syracuse University Press.
- Staggs, Susan L. and Stephanie Riger. 2005. "Effects of Intimate Partner Violence on Low-Income Women's Health and Employment." *American Journal of Community Psychology* 36 (1–2): 133–445.
- Stieglitz, Jonathan, Hillard Kaplan, Michael Gurven, Jeffrey Winking, and Basilio Vie Tayo. 2011. "Spousal Violence and Paternal Disinvestment Among Tsimane' Forager-Horticulturalists." *American Journal of Human Biology* 23(4): 445–57.
- Stock, James H., Jonathan H. Wright, and Motohiro Yogo. 2002. "A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments." *Journal of Business and Economic Statistics* 20(4): 518–29.
- Studenmund, Arnold H. 2011. *Using Econometrics: A Practical Guide*. 6th ed. Boston: Pearson Addison-Wesley.
- Tauchen, Helen V., Ann Dryden Witte, and Sharon K. Long. 1991. "Domestic Violence: A Nonrandom Affair." *International Economic Review* 32(2): 491–511.
- Tolman, Richard M. and Hui-Chen Wang. 2005. "Domestic Violence and Women's Employment: Fixed Effects Models of Three Waves of Women's Employment Study Data." *American Journal of Community Psychology* 36(1): 147–58.
- Vyas, Seema and Charlotte Watts. 2009. "How Does Economic Empowerment Affect Women's Risk of Intimate Partner Violence in Low and Middle Income Countries? A Systematic Review of Published Evidence." *Journal of International Development* 21(5): 577–602.
- Vyas, Seema, Jessie Mbwambo, and Lori Heise. 2015. "Women's Paid Work and Intimate Partner Violence: Insights from Tanzania." *Feminist Economics* 21(1): 35–58.
- United Nations. 2013. *The Elimination and Prevention of all Forms of Violence against Women and Girls*. New York: Economic and Social Council, Commission on the Status of Women.

ARTICLE

- Wooldridge, Jeffrey M. 2010. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.
- World Bank. 2004. *Gender and Development in the Middle East and North Africa: Women in the Public Sphere*. Washington, DC: World Bank.
- . 2014. *Voice and Agency: Empowering Women and Girls for Shared Prosperity*. Washington, DC: World Bank.
- World Health Organization/London School of Hygiene and Tropical Medicine. 2010. *Preventing Intimate Partner and Sexual Violence Against Women: Taking Action and Generating Evidence*. World Health Organization Report. http://www.who.int/violence_injury_prevention/publications/violence/9789241564007_eng.pdf.
- Yount, Kathryn M. 2005. “Resources, Family Organization, and Domestic Violence Against Married Women in Minya, Egypt.” *Journal of Marriage and Family* 67 (3): 579–96.

APPENDIX

Appendix Table 1 Summary statistics

	Mean	Std. Dev.	Min.	Max.
Domestic violence (Domestic violence = 1)	0.28	0.45	0	1
Wife's working status (Wife working = 1)	0.14	0.35	0	1
Wife's education (in years)	10.57	4.04	0	18
Wife's age	34.11	7.77	16	49
Husband employed (Husband employed = 1)	0.82	0.39	0	1
Husband's education (in years)	10.35	3.84	0	20
Husband's age	39.85	9.57	15	91
Age difference	5.95	5.53	− 31	49
Household size	6.16	2.54	1	26
Number of children aged < 3 years	0.56	0.67	0	4
Wealth	7820.70	88499.36	− 345913	467690
Number of co-wives	0.071	0.29	0	3
Kinship marriage (Kinship marriage = 1)	0.422	0.48	0	1
Urban (Urban = 1, Rural = 0)	0.307	0.46	0	1
Badia region (Badia region = 1)	0.14	0.35	0	1
Amman (Amman = 1)	0.119	0.324	0	1
Cluster average of working status	0.14	0.13	0	1

Note: Sample size N = 3,283.

Sources: Department of Statistics of Jordan and ICF Macro (2007), own calculations.

DOMESTIC VIOLENCE IN JORDAN

Appendix Table 2 Frequency distribution of selected background characteristics (%)

	<i>Percentage</i>	<i>Frequency</i>
<i>Household size</i>		
1	0.03	1
2–5	42.48	1,393
6–8	40.59	1,331
9–14	16.50	541
15 +	0.40	13
<i>Number of children aged < 3 years</i>		
0	52.03	1,706
1	38.12	1,250
2	9.55	313
3	0.27	9
4	0.03	1
<i>Spousal age difference</i>		
Wife older	6.16	202
Wife is same age	5.98	196
Wife is 1–4 years younger	31.53	1,034
Wife is 5–9 years younger	37.72	1,237
Wife's 10 + years younger	18.60	610
<i>Wealth quintile</i>		
Lowest	26.68	875
Second	25.86	848
Middle	20.74	680
Fourth	16.29	534
Highest	10.43	342
<i>Number of co-wives</i>		
0	93.90	3,079
1	5.34	175
2	0.55	18
3	0.21	7
<i>Kinship marriage</i>		
Kinship Marriage = 1	42.09	1,380
Kinship Marriage = 0	57.91	1,899

Note: Sample size N = 3,283.

Sources: Department of Statistics of Jordan and ICF Macro (2007), own calculations.