

Is It True That Socio-Economic Development Improves the Empowerment of Women within the Household?

Adan Silverio Murillo*

January 31, 2019

Abstract

This paper analyzes the role of GDP, income inequality, and male-to-female ratio on women's empowerment. Using three samples from 2006 to 2016 of a national-state representative survey specialized in women's empowerment in Mexico and state fixed-effects models, I find: (1) an increase in GDP is associated with higher personal freedom, (2) a better income distribution improves the participation of woman in household decisions, (3) male-to-female ratio affects the perception of gender roles; and (4) economic growth reduces the likelihood of sexual violence. As a robustness test for unobserved time-variant variables, I use a bounding strategy following Oster (2017). In addition, I conducted an instrumental variable approach following Lewbel (2012). The bounding and instrumental variable strategies suggest that the results are robust to unobserved time-variant variables.

Keywords: domestic violence; GDP; sex ratio; income inequality

JEL: J12, J16, J22.

*Department of Public Administration and Policy, American University. E-mail: asmurillo@american.edu

1 Introduction

Can economic development improve women's empowerment? Duflo (2012) presents evidence of four economic development mechanisms that contribute to the empowerment of women: i. economic development relieves the income constraints that poor households face which reduce resources given to girls; ii. it decreases number of children born and maternal mortality; iii. it generates employment opportunities for women; and iv. it frees time and reduces household conflicts. Yet, little evidence exists regarding the effects of economic development and women's empowerment within the household.

In this paper, I analyze the effects of economic growth, income inequality, and male-to-female ratio on women's empowerment within the household. I use data from the 2006, 2011 and 2016 National Survey on Relationships within the Household (ENDIREH), a national-state representative survey regarding women's empowerment and intimate partner violence. Specifically, I use three measures of women's empowerment based on personal freedom, perception of gender roles, and participation in household decisions. Regarding intimate partner violence, ENDIREH provides information for four categories: emotional, economic, physical, and sexual violence.

Using fixed effects at the state level, I find: (1) changes in GDP are associated with higher personal freedom. I estimate that a woman living in a state experiencing a 4 percent annual rate of increase in GDP compounded over 6 years (27 percent) increases her personal freedom between 3 and 4 percent; (2) a better income distribution at the state level improves women's participation in household

decisions. In particular, a decrease of 10 points in the Gini coefficient (a better distribution) translates into an increase between 1 and 2 percentage points in women's participation in household decisions; (3) the male-to-female ratio affects the perception of gender roles. I estimate that a 10 point increase in the ratio of males to females shifts gender roles in favor of men by 12 percentage points; and (4) economic growth reduces the likelihood of suffering sexual violence. In particular, a woman living in a state experiencing a 4 percent annual rate increase in GDP compounded over 6 years (27 percent) reduces the likelihood of suffering sexual violence by 9 percent. As a robustness test for omitted variable bias, I use a bounding strategy following Altonji et al. (2005) and Oster (2017). In addition, I conducted an instrumental variable approach following Lewbel (2012). The bounding and instrumental variable strategies suggest that the results are robust to omitted variable bias.

This work relates to a literature studying the effects of economic development and socioeconomic indicators on women's empowerment. Braga et al. (2018), using data from 36 countries, found that increases in GDP are associated with women participating in their own health care, women making major household purchases, and women visiting family and friends. Bhalotra et al. (2018) using data for 31 countries find that a 1 percent increase in male unemployment increases the incidence of physical violence against women by 2.75 percentage points. Amaral and Bhalotra (2017), using data from India, found that one standard deviation increase in the male-to-female ratio raises violence against women by 14% to 19%.

There are three main contributions of this paper. First, this paper contributes

to the literature on economic development and empowerment of women within the household. Although I find that economic growth contributes to improving personal freedom, I do not find evidence that it improves the perception of gender roles or decisions within the household. In addition, I find that economic growth reduces sexual violence, but not other types of violence such as economic or physical. Second, to the best of my knowledge, this is the first paper that presents evidence about how income inequality affects decisions within the household. Finally, this paper contributes to the literature on the consequences of high male-to-female ratio. In particular, I present evidence on how the sex ratio affects the perception of gender roles.

The rest of the paper is organized as follows: in Section II, I describe the data and empirical methods, in Section III, I present the results, and Section IV is the conclusion.

2 Data and Empirical Methods

2.1 Description of Data

To estimate the impact of socioeconomic development on women's empowerment, I use the National Survey on Relationships within the Household (ENDIREH (2006), ENDIREH (2011), and ENDIREH (2016)). ENDIREH is a national- and state-level representative survey which collects data regarding domestic violence and women's empowerment within the household for women aged 15 or older be-

ing in: (1) a relationship (married or cohabiting), (2) who were previously married (divorced, separated, or widowed), and (3) single women. For this paper, I restrict the sample to only women living with their husbands (married or cohabited) and aged between 15 and 60 years old. Thus, the sample is 184,153 of the women interviewed.

ENDIREH provides information for 21 items that can be grouped into three categories of household women's empowerment: personal freedom (7 items), gender roles (3 items), and participation in household decisions (11 items).¹ The questions regarding personal freedom take a value of one when a woman does not have to ask permission from her husband and zero otherwise. The questions regarding gender roles take a value of one when the woman agrees with the question and zero otherwise. Finally, the questions regarding participation in household decisions take the value of one if the woman participates either jointly (with her partner) or independently, and zero otherwise. Using these items, I create indices for each of these three categories, adding the value of the items. Finally, for each category I present two indices. In one case I turn the missing values into zeros (this index is labeled as one) and in the other case I drop observations with missing data (this index is labeled as two). Thus, the index of personal freedom ranges from 0 to 7, the index of gender roles ranges from 0 to 3, and the index of participation in household decisions ranges from 0 to 11.

ENDIREH provides information for 30 items regarding four categories of intimate partner violence (emotional, economic, physical, and sexual). In particular, I use questions on domestic violence when they refer to an incident of violence in

¹Table 5 presents each item by category.

the last twelve months. For the 30 items², it takes the value of 0 if a woman replies never and 1 if a woman replies sometimes or frequently. Then, using ENDIREH's four categories of violence, I give a value of one if the woman has experienced any violent item in the last 12 months and zero otherwise. Thus, the indices that measure intimate partner violence range from 0 to 1.

GDP, Gini coefficient, and male-to-female ratio are used as measures of socioeconomic development. The data on GDP per capita at the state level is taken from the National Institute of Statistics and Geography for years 2006, 2011, and 2016. The information regarding the Gini coefficient is obtained from the National Evaluation Council for years 2005, 2010, and 2016.³ ⁴Finally, the male-to-female ratio is built using information regarding total population at the state level from the National Council of Population for years 2006, 2011, and 2016.

Table 1 Panel A compares the measures of women's empowerment with respect to GDP per capita, Gini coefficient, and sex ratio. The "Treatment" refers to information regarding women's empowerment above the median of the variable of reference (GDP, Gini, or sex ratio), and the "Control" refers to those that are below that median. Women who live in states that have a GDP higher than the median have higher levels of personal freedom (Treatment) compared to those below (Control). There are not important differences observed in personal freedom when analyzing this information by income distribution or male-to-female ratio.

²Table Table 5 in the Appendix presents the prevalence of each item.

³There is no information for the Gini coefficient for years 2006 and 2011. Thus, I use information for the years 2005 and 2010.

⁴The National Evaluation Council calculates the Gini coefficient based on the total net income per capita. The total net income per capita considers monetary and non-monetary income. Non-monetary income includes transfers in kind and housing rental estimate.

Regarding gender roles, it is observed that women who live in states where the male-to-female ratio is above the median tend to favor male gender roles (0.86), compared with those who are below the median (0.73). The opposite is observed for GDP, i.e. women who live in states that have a GDP higher than the median tend to favor less male gender roles. There are not important differences observed for gender roles when analyzing them by income distribution. Regarding participation in household decisions, it is observed that women participate more when: (1) GDP is above the median, (2) the male-to-female ratio is in favor of women, and (3) with more equal income distribution at the state level. Panel B presents the information regarding intimate partner violence. In general, it is observed that women who live in a state with a GDP higher than the median experience lower emotional, economic, physical, and sexual violence. Yet, there are not important differences observed for any category of intimate partner violence when analyzing them by inequality or male-to-female ratio.

Finally, Table 1 Panel C includes information for controls that will be used such as female characteristics, partner and household characteristics, and other state characteristics. Female characteristics include age, education, speaking an indigenous language, number of times married, and violence from her family of origin (blows, beaten, and insults). Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, controls include children less than 20 years old, number of times married, cohabitation, remittances, and cash transfers from PROGRESA. Finally, state characteristics include homicides per 100,000 inhabitants, unilateral divorce, and living in a rural area.

2.2 Empirical Strategy

To estimate the effect of socioeconomic development on women’s empowerment I use a fixed effects strategy at the state level, and check the robustness of these results using a bounding methodology proposed by Oster and an instrumental variable strategy proposed by Lewbel (2012). The fixed effects regression is as follows:

$$Y_{ist} = \beta_0 + \beta_1 \log GDP_{st} + \beta_2 Gini_{st} + \beta_3 Sexratio_{st} + \beta_4 X_{ist} + \theta_s + \gamma_t + e_{ist} \quad (1)$$

where Y_{ist} is a variable measuring women’s empowerment for women i , in state s and year t ; $\log GDP_{st}$ is the natural logarithm of per capita GDP, $Gini_{st}$ is the Gini coefficient, $Sexratio_{st}$ is the sex ratio of males to females, X_{ist} is a vector of controls, θ_s is a set of state-fixed effects and γ_t is a set of year dummies. Standard errors are clustered at the state level to correct for autocorrelation of the outcome measure across years within a state. The coefficients of interest are β_1 , β_2 and β_3 , which represent the effects of GDP, inequality, and male-to-female ratio on women’s empowerment. State-fixed effects account for unobserved time-invariant characteristics across states, yet it is still possible that unobserved time-variant characteristics affect the results.

To check the robustness of the results, I use a bounding approach proposed by Altonji et al. (2005) and refined by Oster (2016). Altonji et al. (2005) observed that a common approach to evaluate robustness to omitted variable bias is to include additional control variables on the right hand side of the regression. If

such additions do not affect the coefficient of interest, then this coefficient can be considered unlikely to be biased. This strategy implicitly assumes that selection on observables is informative about selection on unobservables. Oster formalizes this idea, and provides conditions for bounds and identification.⁵

Another problem with specification (1) is a potential reverse causality. For example, it could be the case that women’s personal freedom impacts economic growth. A widely used alternative to identify causal relationships is the use of instrumental variables. However, finding an appropriate instrument is often difficult in practice. Another way of dealing with this endogeneity problem has been proposed by Lewbel (2012). Lewbel (2012) suggests an instrumental variable called identification through heteroscedasticity. In particular, he proposes to exploit the correlation between exogenous variables and heteroscedasticity of model disturbances to achieve identification without imposing any exclusion restrictions. Following Lewbel, one can model the reverse causality effect as:

⁵Oster shows that a consistent estimator of the parameter of interest can be obtained, yet it is a function of two parameters unknown by the econometrician: the R-squared for a hypothetical model that contains both the observable and unobservable variables, and the proportion of selection of unobservables on observables. In particular, Oster defines R_{max} as the overall R-squared of the model, that is the R-squared that would be obtained from a regression of the dependent variable (Y) on the variable of interest (T), observables (X_1), and unobservables (X_2). Also, Oster defines δ to be a parameter that ensures the equality $\frac{Cov(T, X_2)}{Var(X_2)} = \delta \frac{Cov(T, X_1)}{Var(X_1)}$, i.e. this relationship formalizes the idea that the magnitude and sign of the relationship between T and X_1 provides some information about the magnitude and sign of the relationship between T and X_2 . Oster argued that selection on unobservables should not be greater than selection on observables. Thus, the lower bound of δ is zero and the upper bound is one. To determine R_{max} , Oster tested the robustness of treatment parameters from randomized control studies published in top economic journals between 2008 and 2013 by using $R_{max} = \min\{\pi\tilde{R}, 1\}$ with various values of π and \tilde{R} being the R-squared of regressing Y on T and X_1 . Oster found that only 20% of results were robust when $R_{max} = 1$ while using $R_{max} = 1.3\tilde{R}$ (or $\pi = 1.3$) reproduced 90% of randomized results. Thus, Oster suggests that β^* (the parameter of interest) be calculated for the following ranges of δ : $0 \leq \delta \leq 1$. This allows one to construct the set $[\beta^*(\delta = 0), \beta^*(\delta = 1)]$ assuming $R_{max} = 1.3\tilde{R}$. If this set excludes zero, the results from the controlled regressions can be considered to be robust to omitted variable bias. In other words, the results indicate that $\beta^* \neq 0$.

$$D_{st} = \gamma_1 Y_{ist} + \gamma_2 X_{ist} + \gamma_s + \gamma_t + \xi_{ist} \quad (2)$$

Where the variable D_{ijh} represents the potential endogenous variable (GDP, Gini, or sex ratio). Y_i and X_i are as defined in equation (1) and ξ_{ist} is the error term. The heteroscedasticity-based identification strategy assumes the existence of heteroscedasticity in ξ_{ist} (and as a consequence on D_{st}). In particular, it is assumed that: $cov(X_{ist}, \xi_{ist}^2) \neq 0$. Lewbel suggest using $[X_{ist} - E(X_{ist})]\hat{\xi}_{ist}$ as an instrument for D_{st} in estimating (1). Where $\hat{\xi}_{ist}$ is the predicted residuals obtained by estimating equation (2) excluding Y_{ist} on the right-hand side. Finally, Lewbel points out that the condition $cov(X_{ist}, \xi_{ist}^2) \neq 0$ need to hold only for a subset Z_{ist} of the vector X_{ist} . More detailed explanations can be found in Lewbel (2012).

3 Results

3.1 Fixed Effects

The Fixed Effects results of the socioeconomic variables of interest (GDP, inequality, and male-to-female ratio) on the measures of women’s empowerment (personal freedom, gender roles, and participation in household decisions) are presented in Table 2. I control for female characteristics, partner and household characteristics, and state characteristics.⁶ The association between the personal

⁶Female characteristics include age, education, speaking an indigenous language, and violence within family of origin. Partner and household characteristics include partner’s age, education, and speaking an indigenous language. In addition, I include children less than 20 years old and cohabitation status. State characteristics include homicides per 100,000 inhabitants, unilateral

freedom index and socioeconomic variables is shown in columns 1 and 2. The measure of personal freedom in column 1 turn the missing values into zeros (it is labeled as a) and the measure in column 2 dropped observations with missing data (it is labeled as b). A positive effect of GDP per capita on personal freedom is observed for both measures. Yet, it is not observed that male-to-female ratio or inequality affect the index of personal freedom. To put the size of this effect in perspective, a woman living in a state experiencing a 4 percent annual rate of increase in GDP compounded over 6 years (27 percent) is predicted to have an increase of .08 units in her personal freedom (using the first measure) or .11 units in her personal freedom (using the second measure). These changes represents between 2.8 and 3.8 percent increase in the average number of personal decisions made by the women.

Table 2 columns 3 and 4 present results for the effects of socioeconomic variables on perception of gender roles that favor men. As in the previous case, I present two measures of gender roles: one that convert the missing values into zeros (column 3), and other that dropped out the observations with missing values (column 4). Regardless of the measure used, a positive effect is observed of male-to-female ratio over gender roles that favor men. To put the size of this effect in perspective, an increase of 10 points in the male-to-female ratio has an increase of .09 units in the index of gender roles. This change represents a 12 percent increase in the index of gender roles that favor men.

Finally, columns 5 and 6 present results for the effects of socioeconomic variables on women's household decision-making. The measure of participation in divorce, and living in a rural area.

household decisions in column 5 turned the missing values into zeros and the measure in column 6 dropped observations with missing values. It is observed that increases in inequality measured by the Gini coefficient decrease the participation of women in household decisions. In particular, an increase of ten points in the Gini coefficient translates into a decrease between 1 and 2 percent points in participation of women in household decisions. There is no effect of male-to-female ratio on participation in household decisions. Regarding economic growth, a positive effect of GDP on participation in household decisions is observed using the first measure (column 5), but this result is not robust when the second measure is used (column 6).

Table 3 presents results of the socioeconomic variables on the four categories of intimate partner violence (physical, emotional, economic, and sexual). I use the same control variables as those used in Table 2. I find a negative effect of GDP per capita on sexual violence. However, it is not observed that GDP affects other types of violence. To put the size of this effect in perspective, a woman living in a state experiencing a 4 percent annual rate of increase in GDP compounded over 6 years (27 percent) is predicted to have a decrease of .004 units in the likelihood of suffering sexual violence. This change represents 9.4 percent decrease in the average amount of sexual violence that the women experience. Finally, regarding male-to-female ratio and inequality, I do not find evidence that these variables affect any of the four types of domestic violence analyzed.

3.2 Robustness Checks: Bounding Methodology, Instrumental Variables, and Pairs Cluster Bootstrap-t Procedure

Although fixed effects control for time-invariant omitted variables, it does not eliminate time-variant omitted variables. Thus, I estimate the range of estimated parameters using a bounding methodology proposed by Oster (2017). I check four results: (1) effects of GDP on personal freedom, (2) effects of male-to-female ratio on gender roles that favor males, (3) effects of inequality on women’s participation in household decisions, and (4) effects of GDP on sexual violence. Table 4 presents the results of the bounding methodology. I find that the bounds for all the outcomes analyzed do not include the zero, suggesting that the results are robust.

Table 5 presents the results using an instrumental variable constructed through heteroscedasticity following Lewbel (2012). Using this strategy the results observed using fixed effects and a bounding methodology are maintained. Yet, I observed a small decrease in the effect of GDP on personal freedom and an increase of the effects of income inequality on women’s household decision participation. Finally, I do not observe a change on the effect of male-to-female ratio on gender roles.⁷

Cameron et al. (2008) notice that with a few (five to thirty) number of clusters, the cluster-robust standard errors are downward biased. While I have 32 clusters

⁷I estimate the first-stage regression in equation (2) excluding Y_{ist} and test for heteroscedasticity using a Breush-Pagan test. According to the test results (GDP, $chi^2 = 546, 448$, p-value=0.00; male-to-female ratio, $chi^2 = 27, 474$, p-value=0.00; Gini, $chi^2 = 2, 930$, p-value=0.00) there is strong evidence for heteroscedasticity in the first stage regression.

at the state level, I conducted a pair cluster bootstrap-t procedure described in Cameron et al. (2008). This procedure is recommended in order to obtain accurate inference about the statistical significance of a parameter when the data is clustered with a small number of clusters. Table 6 reproduces Table 2 adding a column for sexual violence using this method. In general, it is observed an increase on the standard errors, but the statistical significance of the results are maintained.

3.3 Heterogeneous Effects

Table 7 Panel A presents results regarding heterogeneous effects of economic growth on personal freedom depending on women's education, being indigenous, number of children, and cohabitation status. Heterogeneous effects are not observed depending on women's education. Yet, important heterogeneous effects are observed depending on being indigenous, number of children, and cohabiting. Specifically, a woman who is indigenous, who has no more than one child, and who is married (not cohabiting) get more benefits from the economic growth in terms of personal freedom.

Panel B presents results regarding heterogeneous effects of sex ratio on gender roles. Heterogeneous effects are not observed depending on women's education, indigenous, or the number of children. Yet, heterogeneous effects are observed depending on cohabitation status. In particular, an increase of the male-to-female ratio affects more the perception of gender roles in women who are married than those who are cohabiting.

Panel C presents results regarding heterogeneous effects of inequality on women's participation in household decisions. Heterogeneous effects are observed depending on women's education and being indigenous, yet heterogeneous effects are not observed by number of children or cohabiting. In particular, it is observed that women who have less education (primary or less) are more affected in the decisions of households when it is observed an increase in inequality. These changes represent 3.8% fewer decisions for women who have primary education or less and only 1.1% fewer decisions for women who have secondary education or more. In addition, women who are indigenous participate in fewer decisions within the household when there is an increase in inequality. These changes represents 7.0% less participation in decisions for women who are indigenous and only 1.8% for women who are not indigenous.

Table 8 presents heterogeneous effects of economic growth on sexual violence depending on women's education, being indigenous, number of children, and cohabiting. I do not find evidence of heterogeneous effects for any of these categories.

4 Conclusion

This paper analyzes the effects of economic growth, income inequality, and male-to-female ratio on women's empowerment within the household in Mexico. I use the following measures of women's empowerment: personal freedom, perception of gender roles, participation in household decisions, emotional violence, economic violence, physical violence, and sexual violence.

Using fixed effects at the state level I find that changes in GDP are associated with higher personal freedom. In addition, I find that women who have one or no children and are married (not cohabiting) get more benefits from economic growth in terms of personal freedom, and that a better income distribution at the state level improves the participation of women in household decisions. Yet, women who are indigenous or less educated participate in fewer decisions within the household when there is an increase in inequality. I also find that the male-to-female ratio affects the perception of gender roles. In addition, it is observed that an increase on the male-to-female ratio affects the perception of gender roles in women who are married more than those who are cohabiting. Finally, I find that economic growth reduces the likelihood of suffering sexual violence.

State-fixed effects account for unobserved time-invariant characteristics across states, yet it is still possible that unobserved time-variant characteristics affect the results. To check the robustness of the results presented, I use a bounding approach proposed by Altonji et al. (2005) and refined by Oster (2016). In addition, I use an instrumental variable strategy proposed by Lewbel (2012). The results suggest that the estimates are robust to omitted variable bias.

It is believed that economic growth can contribute to women's empowerment. However, I find evidence that it only improves two of the eight categories of empowerment analyzed. A similar result was observed with respect to income inequality (which affected only the category of participation in household decisions) and sex imbalances (which affected only the category of perception of gender roles). While socioeconomic development improves women's empowerment, it appears to be not enough to improve women's conditions within the household.

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5 Appendix

Table 1: Descriptive Statistics

	GDP Per Capita		Gini coefficient		Sex ratio (male to female)	
	Treatment	Control	Treatment	Control	Treatment	Control
Panel A. Women's empowerment						
Personal freedom (1)	3.01	2.81	2.92	2.91	2.89	2.93
Personal freedom (2)	3.23	3.05	3.15	3.13	3.14	3.14
Male gender roles (1)	0.72	0.86	0.80	0.79	0.86	0.73
Male gender roles (2)	0.72	0.86	0.80	0.79	0.86	0.73
Participation in household decisions (1)	9.02	8.74	8.85	8.91	8.74	9.01
Participation in household decisions (2)	10.32	10.12	10.17	10.28	10.14	10.30
Panel B. Domestic Violence						
Emotional IPV	0.28	0.30	0.29	0.29	0.28	0.29
Economic IPV	0.17	0.19	0.18	0.18	0.18	0.18
Physical IPV	0.07	0.08	0.08	0.07	0.08	0.08
Sexual IPV	0.03	0.04	0.04	0.04	0.04	0.04
Panel C. Control Variables						
Woman's age	38.98	39.02	39.10	38.90	39.07	38.93
Woman's Education:	0.69	0.60	0.62	0.67	0.62	0.67
1 Secondary or more 0 Primary or no schooling						
Indigenous Woman	0.04	0.10	0.07	0.07	0.08	0.06
Partner's age	42.36	42.55	42.55	42.36	42.57	42.35
Partner's Education:	0.70	0.61	0.62	0.68	0.64	0.66
1 Secondary or more 0 Primary or no schooling						
Indigenous Partner	0.05	0.10	0.07	0.07	0.09	0.06
Children less 20 years old:	0.51	0.55	0.54	0.51	0.53	0.53
1 Two or more 0 Otherwise						
Cohabiting couple	0.24	0.24	0.24	0.24	0.23	0.25
Number of times married	1.12	1.09	1.09	1.13	1.10	1.11
Remittances	0.03	0.04	0.04	0.03	0.03	0.04
Cash Transfers (PROSPERA)	0.11	0.20	0.19	0.13	0.17	0.14
Homicides per 100,000 inhabitants	18.43	18.46	15.85	21.02	15.68	21.05
Unilateral Divorce: 1 Yes 0 No	0.13	0.11	0.15	0.09	0.05	0.18
Rural: 1 Yes 0 No	0.18	0.24	0.25	0.18	0.22	0.20
Blows in your family of origin	0.27	0.30	0.31	0.26	0.29	0.28
You were beaten in your family of origin	0.36	0.39	0.38	0.37	0.38	0.37
Insults in your family of origin	0.28	0.31	0.31	0.28	0.29	0.31

Source: National Survey on Relationships within the Household (ENDIREH)

Table 2: FE Estimates: Effects of Socio-economic Variables on Women's Empowerment

	Personal freedom (a)	Personal freedom (b)	Male gender roles (a)	Male gender roles (b)	Participation in household decisions (a)	Participation in household decisions (b)
Log (GDP Per Capita)	0.301** (0.115)	0.437*** (0.157)	0.033 (0.063)	0.033 (0.063)	-0.281** (0.138)	0.052 (0.065)
Sex ratio (males to females)	0.012 (0.014)	0.022 (0.014)	0.009*** (0.003)	0.009*** (0.003)	0.010 (0.011)	0.005 (0.008)
Inequality (Gini coefficient)	-0.223 (0.570)	-0.034 (0.586)	0.222 (0.163)	0.224 (0.165)	-1.820*** (0.437)	-0.970** (0.359)
Female characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.07	0.07	0.20	0.21	0.14	0.07
Observations	181527	132181	181921	181481	181925	74999

Note: Female characteristics include age, education, speak an indigenous language, number of times married, blows, beaten, and insults in her family of origin. Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, children less than 20 years old, number of times married, cohabiting, remittances, and cash transfers from PROSPERA. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: FE Estimates: Effects of Socio-economic Variables on Domestic Violence

	(1) Physical	(2) Emotional	(3) Economic	(4) Sexual
Log (GDP Per Capita)	-0.011 (0.011)	-0.005 (0.031)	-0.022 (0.019)	-0.014** (0.006)
Sex ratio (males to females)	-0.001 (0.001)	-0.003 (0.002)	-0.002 (0.001)	0.000 (0.000)
Inequality (Gini coefficient)	-0.013 (0.033)	0.053 (0.092)	-0.020 (0.051)	0.024 (0.029)
Female characteristics	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes
R^2	0.04	0.07	0.06	0.03
Observations	181964	181966	181956	181928

Note: Female characteristics include age, education, speak an indigenous language, number of times married, blows, beaten, and insults in her family of origin. Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, children less than 20 years old, number of times married, cohabiting, remittances, and cash transfers from PROSPERA. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Bounding Methodology: Effects of Socio-economic Variables on Domestic Violence

	Personal freedom (a)	Personal freedom (b)	Male gender roles (a)	Male gender roles (b)	Participation in household decisions (a)	Participation in household decisions (b)	Sexual Violence
Log (GDP Per Capita)	[0.270, 0.332]	[0.365, 0.508]					[-0.012, -0.016]
Sex ratio (males to females)			[0.007,0.011]	[0.007,0.011]			
Inequality (Gini coefficient)					[-1.214, -2.425]	[-0.450, -1.490]	
Female characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	181527	132181	181921	181481	181925	74999	181928

Note: Female characteristics include age, education, speak an indigenous language, number of times married, blows, beaten, and insults in her family of origin. Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, children less than 20 years old, number of times married, cohabiting, remittances, and cash transfers from PROSPERA. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and rural.

Table 5: Lewbel's Instrumental Variables: Effects of Socio-economic Variables on Domestic Violence

	Personal freedom (a)	Personal freedom (b)	Male gender roles (a)	Male gender roles (b)	Participation in household decisions (a)	Participation in household decisions (b)	Sexual violence (a)
Log (GDP Per Capita)	0.270** (0.124)	0.385*** (0.134)	0.032 (0.062)	0.033 (0.062)	-0.278** (0.137)	0.054 (0.065)	-0.014** (0.006)
Sex ratio (males to females)	0.012 (0.013)	0.022 (0.014)	0.009*** (0.003)	0.009*** (0.003)	0.010 (0.011)	0.005 (0.008)	0.000 (0.000)
Inequality (Gini coefficient)	-0.217 (0.560)	-0.024 (0.577)	0.222 (0.161)	0.224 (0.162)	-1.952*** (0.423)	-1.043*** (0.361)	0.024 (0.028)
Female characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.07	0.07	0.20	0.21	0.14	0.07	0.03
Observations	181527	132181	181921	181481	181925	74999	181928
F-statistic first stage	3399	2186	135	19	2006	578	3409

Note: Female characteristics include age, education, speak an indigenous language, number of times married, blows, beaten, and insults in her family of origin. Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, children less than 20 years old, number of times married, cohabiting, remittances, and cash transfers from PROSPERA. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: FE Estimates: Effects of Socio-economic Variables on Women's Empowerment - Wild Cluster Bootstrapped Standard Errors

	Personal freedom	Personal freedom	Male gender roles	Male gender roles	Participation in household decisions	Participation in household decisions	Sexual Violence
	(a)	(b)	(a)	(b)	(a)	(b)	
Log (GDP Per Capita)	0.301** (0.126)	0.437** (0.180)	0.033 (0.125)	0.033 (0.125)	-0.281** (0.158)	0.052 (0.059)	-.014** (0.008)
Sex ratio (males to females)	0.012 (0.017)	0.022 (0.018)	0.009** (0.004)	0.009** (0.004)	0.010 (0.013)	0.005 (0.010)	0.000 (0.006)
Inequality (Gini coefficient)	-0.223 (0.669)	-0.034 (0.708)	0.222 (0.197)	0.224 (0.199)	-1.820*** (0.408)	-0.970** (0.404)	0.024 (0.069)
Female characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.07	0.07	0.20	0.21	0.14	0.07	0.03
Observations	181527	132181	181921	181481	181925	74999	181928

Note: Female characteristics include age, education, speak an indigenous language, number of times married, blows, beaten, and insults in her family of origin. Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, children less than 20 years old, number of times married, cohabiting, remittances, and cash transfers from PROSPERA. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Heterogeneous Effects of Socio-Economic Variables on Women’s Empowerment with respect to Education, Indigenous, Number of Children, and Cohabiting.

	Personal freedom			
	(1)	(2)	(3)	(4)
Log (GDP Per Capita)	0.304** (0.116)	0.293** (0.115)	0.326*** (0.114)	0.303** (0.114)
Log (GDP Per Capita) × Woman’s Education: 1 Secondary or more 0 Primary or no schooling	-0.011 (0.030)			
Log (GDP Per Capita) × Indigenous Woman		0.071** (0.030)		
Log (GDP Per Capita) × Children less 20 years old: 1 Two or more 0 Otherwise			-0.040* (0.022)	
Log (GDP Per Capita) × Cohabiting couple				-0.048** (0.021)
Observations	181527	181527	181527	181527
	Male Gender Roles			
	(1)	(2)	(3)	(4)
Sex ratio (males to females)	0.008 (0.005)	0.009*** (0.003)	0.010*** (0.003)	0.010*** (0.003)
Sex ratio (males to females) × Woman’s Education: 1 Secondary or more 0 Primary or no schooling	0.001 (0.005)			
Sex ratio (males to females) × Indigenous Woman		0.001 (0.004)		
Sex ratio (males to females) × Children less 20 years old: 1 Two or more 0 Otherwise			-0.001 (0.001)	
Sex ratio (males to females) × Cohabiting couple				-0.003* (0.002)
Observations	181921	181921	181921	181921
	Participation in household decisions			
	(1)	(2)	(3)	(4)
Inequality (Gini coefficient)	-3.496*** (0.767)	-1.645*** (0.433)	-1.969*** (0.507)	-1.620*** (0.446)
Inequality (Gini coefficient) × Woman’s Education: 1 Secondary or more 0 Primary or no schooling	2.461*** (0.753)			
Inequality (Gini coefficient) × Indigenous Woman		-4.751*** (1.693)		
Inequality (Gini coefficient) × Children less 20 years old: 1 Two or more 0 Otherwise			0.317 (0.519)	
Inequality (Gini coefficient) × Cohabiting couple				-0.895 (0.606)
Observations	181925	181925	181925	181925

Note: All the regressions include female characteristics, partner and household characteristics, state characteristics, and state and year fixed effects. Female characteristics include age, education, speak an indigenous language, number of times married, blows, beaten, and insults in her family of origin. Partner and household characteristics include partner’s age, education, and speaking an indigenous language. In addition, children less than 20 years old, number of times married, cohabiting, remittances, and cash transfers from PROSPERA. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Heterogeneous Effects Socio-Economic Variables on Sexual Violence with respect to Education, Indigenous, Number of Children, and Cohabiting.

	Sexual Violence			
	(1)	(2)	(3)	(4)
Log (GDP Per Capita)	-0.016** (0.006)	-0.014** (0.006)	-0.013** (0.006)	-0.014** (0.006)
Log (GDP Per Capita) × Woman's Education: 1 Secondary or more 0 Primary or no schooling	0.005 (0.003)			
Log (GDP Per Capita) × Indigenous Woman		-0.002 (0.003)		
1em] Log (GDP Per Capita) × Children less 20 years old: 1 Two or more 0 Otherwise			-0.001 (0.001)	
Log (GDP Per Capita) × Cohabiting couple				0.001 (0.001)
Observations	181928	181928	181928	181928

Note: All the regressions include female characteristics, partner and household characteristics, state characteristics, and state and year fixed effects. Female characteristics include age, education, speak an indigenous language, number of times married, blows, beaten, and insults in her family of origin. Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, children less than 20 years old, number of times married, cohabiting, remittances, and cash transfers from PROSPERA. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Descriptive Statistics of Women's Empowerment by Item

	GDP Per Capita		Gini coefficient		Sex ratio	
	Treatment	Control	Treatment	Control	Treatment	Control
Panel A. Personal freedom						
to work for a payment or compensation?	0.22	0.20	0.21	0.21	0.21	0.21
to go shopping?	0.30	0.29	0.31	0.29	0.30	0.30
to visit relatives or friends?	0.24	0.22	0.23	0.23	0.23	0.23
to buy something for you?	0.56	0.54	0.55	0.55	0.55	0.56
to participate in any activity or policy?	0.38	0.33	0.35	0.36	0.35	0.36
to make friends with a person that your husband or partner does not know?	0.67	0.64	0.66	0.64	0.65	0.65
to vote for a party or candidate?	0.81	0.77	0.79	0.79	0.79	0.79
Panel B. Male gender roles						
The man must take responsibility for all the expenses of the family.	0.51	0.58	0.54	0.55	0.59	0.50
A woman does not have the same capacity as a man to earn money.	0.12	0.17	0.16	0.14	0.16	0.14
It is the wife's obligation to have sex with her husband even if she does not want	0.09	0.11	0.11	0.09	0.12	0.08
Panel C. Participation in household decisions						
If you can work or study	0.90	0.88	0.89	0.89	0.88	0.90
If you can leave your house	0.93	0.91	0.91	0.92	0.91	0.93
What to do with the money you earn	0.95	0.94	0.94	0.95	0.94	0.95
If you want to buy things for you	0.96	0.95	0.95	0.96	0.95	0.96
If you can participate in the social or political life of your community	0.94	0.91	0.92	0.94	0.92	0.94
How the money is spent	0.93	0.92	0.92	0.92	0.91	0.93
On permits for daughters and sons	0.92	0.90	0.90	0.91	0.90	0.92
Change or move from home and/or city	0.88	0.86	0.87	0.88	0.86	0.88
When having sex	0.93	0.92	0.92	0.93	0.92	0.93
If contraceptives are used	0.96	0.94	0.95	0.95	0.94	0.96
Who should use contraceptive methods	0.93	0.91	0.91	0.93	0.91	0.93

Source: National Survey on Relationships within the Household (ENDIREH)

Table 10: Descriptive Statistics of Domestic Violence by Item

	GDP Per Capita		Gini coefficient		Sex ratio	
	Treatment	Control	Treatment	Control	Treatment	Control
Panel A. Physical IPV						
pushed you or pulled your hair?	0.06	0.06	0.06	0.06	0.06	0.06
tied you up?	0.00	0.00	0.00	0.00	0.00	0.00
kicked you?	0.01	0.02	0.01	0.01	0.01	0.01
thrown any object at you?	0.02	0.02	0.02	0.02	0.02	0.02
beaten you with his hands or any object?	0.04	0.05	0.05	0.04	0.04	0.04
tried to hang or choke you?	0.01	0.01	0.01	0.01	0.01	0.01
assaulted you with a knife or blade?	0.00	0.00	0.00	0.00	0.00	0.00
fired a weapon at you?	0.00	0.00	0.00	0.00	0.00	0.00
Panel B. Emotional IPV						
shamed, underestimated or humiliated you?	0.09	0.09	0.10	0.08	0.08	0.10
ignored or not show you affection?	0.09	0.09	0.09	0.09	0.09	0.09
said you cheat on him?	0.06	0.07	0.07	0.07	0.07	0.07
made you feel fear?	0.05	0.06	0.05	0.05	0.05	0.05
threatened to leave you, hurt you, take your children away or kick you out?	0.06	0.07	0.07	0.07	0.06	0.07
locked you in, forbidden you from going out or being visited?	0.02	0.02	0.02	0.02	0.02	0.02
turned your children or relatives against you?	0.02	0.02	0.02	0.02	0.02	0.02
have spied on you?	0.02	0.02	0.02	0.02	0.02	0.02
threatened you with a weapon?	0.02	0.01	0.02	0.02	0.01	0.02
threatened to kill you, himself or the children?	0.01	0.01	0.01	0.01	0.01	0.01
destroyed, thrown away or hidden things belonging to you or the household?	0.03	0.03	0.03	0.03	0.03	0.03
stopped talking to you?	0.17	0.18	0.17	0.17	0.17	0.17
got angry because household chores are not done like he wants?	0.08	0.10	0.09	0.09	0.09	0.09
Panel C. Economical IPV						
complained about how you spend money?	0.10	0.11	0.10	0.10	0.10	0.10
been stingy with the household expenses, even though he has money?	0.06	0.07	0.07	0.06	0.07	0.06
not given you the unkeep or threatened you to not giving it?	0.04	0.05	0.05	0.04	0.04	0.05
spent money needed for the household?	0.05	0.06	0.05	0.05	0.05	0.05
appropriated or taken money or possessions from you?	0.01	0.01	0.01	0.01	0.01	0.01
forbidden you to work or study?	0.05	0.06	0.06	0.06	0.06	0.06
Panel D. Sexual IPV						
demanded you to have sexual relations?	0.03	0.04	0.03	0.03	0.03	0.03
forced you to have sexual things you do not like?	0.01	0.01	0.01	0.01	0.01	0.01
used physical strength to force you to have sexual relations?	0.01	0.01	0.01	0.01	0.01	0.01

Source: National Survey on Relationships within the Household (ENDIREH)