

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

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Abstract

This paper analyzes the role of GDP, income inequality, and sex ratio on women's empowerment measured by domestic violence, personal freedom, gender roles, and participation in household decisions. Using three waves of a national-state representative survey specialized in women's empowerment in Mexico and state fixed-effects models, I find: i. an increase in GDP is associated with improvements in personal freedom; ii. a better income distribution improves the participation of woman in household decisions; iii. sex imbalances affect the perception of gender roles; and iv. economic growth reduces the likelihood of suffering sexual violence. To check the robustness of these results to unobserved time-variant variables, a novel bounding technique developed by Oster (2017) is implemented. The results suggest that the estimates are robust to omitted variable bias.

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

JEL: J12, J16, J22.

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1 Introduction

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

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

Using fixed effects at the state level, we find: i. changes in GDP are associated with higher personal freedom. We 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; ii. a better income distribution at the state level improves the participation of women in

household decisions. In particular, a decrease of 10 points in the Gini coefficient translates into an increase between 1 and 2 percentage points in the participation of women in household decisions; iii. sex imbalances affect the perception of gender roles. We estimate that an increase of 10 points increase in the ratio of males to females increases gender roles in favor of men by 12 percentage points; and iv. economic growth reduces the likelihood of suffering sexual violence. In particular, a woman living in a state experiencing a 4 percent annual rate of increase in GDP compounded over 6 years (27 percent) reduces the average number of suffering sexual violence by 9 percent. As a robustness test for omitted variable bias, we use a bounding strategy following Altonji et al. (2005) and Oster (2017). The bounding strategy suggests that the results are robust to omitted variable bias.

Our 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 find that increases in GDP are associated with women participating in their own health care, major household purchases, and visits to family and friends. Bhalotra et al. (2018) using data for thirty one countries find that a one percent increase in male unemployment rate increases the incidence of physical violence against women by 2.75 percentage points. Amaral and Bhalotra (2017) using data from India find that one standard deviation increase in the share of men raises violence against women by 14% to 19%.

The main contributions of this paper are threefold. First, this paper contributes to the literature on economic development and empowerment of women within the household. Although we find that economic growth contributes to improving per-

sonal freedom, we do not find evidence that it improves the perception of gender roles or decisions within the household. In addition, we find that economic growth reduces sexual violence, but not other types of violence such as economic or physical. Second, to the best of our knowledge, this is the first paper that presents evidence about how income inequality at the state level affects decisions within the household. Finally, we contribute to the literature on the causes of increasing male-bias in the sex ratio. In particular, we 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, we describe the data and empirical methods; in Section III, we 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, we use the National Survey on Relationships within the Household (ENDIREH) of 2006, 2011, and 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 being in: i. a relationship (married or cohabiting); ii. who were previously married (divorced, separated, or widowed); and iii. single women. For this paper, we restrict our sample to only women living

with their husbands (married or cohabited) and aged between 15 and 60 years old. Thus, we get 65,892, 63,767 and 54,494 women interviewed in 2006, 2011, and 2016, respectively.

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

ENDIREH provides information for 30 items regarding intimate partner violence, which are classified in four categories: emotional, economical, physical, and sexual. In particular, we use questions on domestic violence when they refer to an incident of violence in 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, we construct four categories of violence (emotional, economical, physical,

¹Table 8 presents each item by category.

²Table 9 in the Appendix presents the prevalence of each item.

and sexual), taking the value of one if the woman has experienced any violent item in the last 12 months and zero otherwise.

GDP, Gini coefficient, and sex 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 (INEGI) for years 2006, 2011, and 2016. The information regarding the Gini coefficient is obtained from the National Evaluation Council (CONEVAL) for years 2005, 2010, and 2016. Finally, the sex ratio is built using information regarding total population at the state level from the National Council of Population (CONAPO) 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 observe a higher level of personal freedom (Treatment) compared to those below (Control). It is not observed important differences in personal freedom when analyzing this information by income distribution or sex ratio. Regarding gender roles, it is observed that women who live in states when the sex ratio of males to females 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. It is not observed important differences on gender roles when analyzing them by income distribution. Regarding participation in house-

hold decisions, it is observed that women participate more in states with: i. a GDP that is above the median; ii. the sex ratio is in favor of women; and iii. with better income distribution. Panel B presents the information regarding intimate partner violence. In general, it is observed that a women who lives in a state with a GDP higher than the median experience lower emotional, economical, physical, and sexual violence. Yet, it is not observed important differences on any category of intimate partner violence when analyzing them by inequality or sex 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, cohabiting, 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 we use a fixed effects strategy at the state level, and check the robustness of the results using a bounding methodology proposed by Oster (2016). The fixed effects regression is as follows:

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

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 sex-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 our results. To check the robustness of our results, we 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 to be unlikely 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. In addition, Oster points out that it is not only necessary to add controls, but to observe the movements in the R-squared.

Oster 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:

(1) the R-squared for a hypothetical model that contains both the observable and unobservable variables; and, (2) 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 $\beta^* \neq 0$.

3 Results

3.1 Fixed Effects

The Fixed Effects results of the socioeconomic variables of interest (GDP, inequality and sex-ratio) on the measures of women’s empowerment (personal freedom, gender roles, and participation in household decisions) are presented in Table 2. We control for female characteristics, partner and household characteristics, and state characteristics.³ The association between the personal 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). It is observed a positive effect of GDP per capita on personal freedom for both measures. Yet, it is not observed that sex 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, we

³Female 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, we include children less than 20 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, unilateral divorce, and living in a rural area.

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, it is observed a positive effect of sex ratio (male to females) over gender roles that favor men. To put the size of this effect on perspective, an increase of 10 points in the ratio of males to females 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 participation in household decisions. The measure of participation in household decisions in column 5 turn 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 decreases 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 sex ratio on participation in household decisions. Regarding economic growth, it is observed a positive effect of GDP on participation in household decisions 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, economical, and sexual). We use the same control variables as those used in Table 2. We find that a negative effect of GDP per capita on sexual violence. Yet, it is not observed that GDP affects the 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 number of sexual violence suffered by the women. Finally, regarding sex ratio and inequality, we do not find evidence that these variables affect any of the four types of domestic violence analyzed.

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

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

Cameron et al. (2008) notice that with a few (five to thirty) number of clusters, the cluster-robust standard errors are downward biased. While we have 32 clusters at the state level, we 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 5 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 6 Panel A presents results regarding heterogeneous effects of economic growth on personal freedom depending on women's education, being indigenous, number of children, and cohabiting. It is not observed heterogeneous effects depending on women's education. Yet, it is observed important heterogeneous effects 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. It is not observed heterogeneous effects depending on women's education, indigenous, or the number of children. Yet, it is observed heterogeneous effects depending on cohabiting. In particular, an increase on the sex ratio (males to females) 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 in women's participation in household decision. It is observed heterogeneous effects depending on women's education and being indigenous; yet, it is not observed heterogeneous

effects 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 represents 3.8% less decisions for women who have primary education or less and only 1.1% less 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 7 presents heterogenous effects of economic growth on sexual violence depending on women's education, being indigenous, number of children, and cohabiting. We do not find evidence of heterogenous effects for any of these categories.

4 Conclusion

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

Using fixed effects at the state level we find that: i. changes in GDP are associated with higher personal freedom. In addition, we find that a woman who has one children or less and who is married (not cohabiting) get more benefits from economic growth in terms of personal freedom; ii. 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; iii. sex imbalances affect the perception of gender roles. In addition, it is observed that an increase on the sex ratio (males to females) affects more the perception of gender roles in women who are married than those who are cohabiting; and iv. 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 our results. To check the robustness of the results presented, we use a bounding approach proposed by Altonji et al. (2005) and refined by Oster (2016). The results suggest that the estimates are robust to omitted variable bias.

It is believed that economic growth can contribute to women's empowerment. Yet, we 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

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

| Personal freedom (a) | | | | |
|---|----------------------|----------------------|----------------------|----------------------|
| | (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 (a) | | | | |
| | (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 (a) | | | | |
| | (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 7: 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 8: 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 wa | 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 or that you have | 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

Table 9: 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 | | | | | | |
| demanding 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