

Remittances and Domestic Violence

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Abstract

This paper estimates the effects of money transfers sent by relatives or acquaintances, better known as remittances, on intimate partner violence (IPV) for married women living in Mexico. Using three waves of a national-state representative survey specialized in violence against women, and state fixed-effects regression models, the results show that receiving remittances increases the likelihood of IPV by 5.5 percentage points. We document three channels contributing to this detrimental effect on married women: (1) There is a strong association between households receiving remittances and husbands who do not work, suggesting that men exert IPV against women to compensate for the lack of income with remittances. (2) There is an increase in marital conflicts related to the consumption of alcohol by the husband. And (3) there is evidence that remittances decrease women's bargaining power within the household.

Keywords: domestic violence; remittances

JEL: J12, J16, J22.

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1 Introduction

Whenever there is scarcity of resources, people bargain - even within their own households - to obtain solutions to each of their economic problems. Oftentimes, this bargaining process can lead to undesirable social conducts such as violence. Scholars associate monetary transfers with domestic violence, but there is no unified theory regarding the direction of the effects. [Farmer and Tiefenthaler \(1997\)](#), using a non-cooperative household model of domestic violence, predict an increase in empowerment and a decrease in intimate partner violence (IPV) for women who receive income and other financial support from outside marriage. Contrary to that, [Bloch and Rao \(2002\)](#) explain dowry-related violence in India, using a model where a husband extracts rents from the wife's family by exerting violence as a bargaining instrument. Specifically, their model predicts that women from richer families are at a higher level of risk of IPV because there are more resources to extract.

Recent literature focuses on the effect of government's conditional and unconditional cash transfers on domestic violence for beneficiary women ([Angelucci \(2008\)](#), [Bobonis, Castro, and Morales \(2015\)](#), and [Hidrobo and Fernald \(2013\)](#)). Yet, there is a research gap for the effect of money transferred by family or acquaintances, better known as remittances, on IPV for beneficiary women. According to [Li Ng](#)

(2019), Mexico's statistics from 2018 indicate that remittances from outside the country account for 2.7% of Gross Domestic Product (GDP). Most of these foreign remittances that flow to Mexico come from the United States, namely, 97%. Compared with the sizes of other sectors in that same year, revenues from outside-the-country remittances (33.5 billion dollars) are higher than those from oil (30.5 billion dollars) or tourism (22.5 billion dollars). Furthermore, remittances from outside the country are bigger than any other cash transfer program run by the Mexican government, such as PROGRESA-OPORTUNIDADES-PROSPERA,¹ hereinafter POP, which accounts for less than 0.5% of the GDP.

In this paper, we analyze the effects of remittances sent by relatives from both outside and within the country on IPV for married women living in Mexico. We use data from three waves of a national-state representative survey on violence against women: the National Survey on Relationships within the Household (ENDIREH (2006), ENDIREH (2011), and ENDIREH (2016)). Using fixed effects at the state level, we find that receiving remittances increases the likelihood of IPV by 5.5 percentage points for married women living in Mexico. Additionally, results show that receiving remittances increases the probability of domestic violence by 5.4, 3.8, 1.5, and 1.2 percentage points for emotional, economic, physical, and sexual

¹In 1997 Mexico implemented the PROGRESA program, which transfers money to low-income families under the condition that they send their children to school.

violence against women, respectively. As a robustness test for omitted variable bias, we use a bounding strategy following Altonji et al. (2005) and Oster (2017). Ranges from the bounding strategy suggest that the results are robust to omitted variable bias. Further robustness tests indicate that there is no difference in the IPV-impact between remittances sent within the country and those sent from outside the country, for married women living in Mexico.

The main contributions of this paper are twofold. First, this paper provides evidence to support that the nature of monetary transfers matters in terms of domestic violence for married women. To the best of our knowledge, this is the first paper that shows that unconditional cash transfers, in the form of remittances, impact IPV. Second, this paper presents findings on household dynamics through which remittances impact IPV, to the detriment of women. Namely, we find evidence of three suggestive mechanisms: (1) remittances decrease the probability of men being employed, (2) remittances increase men's alcohol consumption and (3) remittances decrease women's bargaining power. We structure the rest of the paper as follows: Section 2 explores the existing literature on the effects of monetary transfers on IPV. Section 3 describes the data and empirical methods. Section 4 contains results. Finally, Section 5 concludes with possible policy recommendations.

2 Cash Transfers and Domestic Violence

This paper relates to literature studying the effects of cash transfers on domestic violence in developing countries. [Angelucci \(2008\)](#), using data from a randomized experiment of households participating in the POP program in rural areas, finds no effect on alcohol-related domestic abuse against women. Yet, she provides evidence to support that small transfers decrease violence while large transfers increase the aggressive behavior of husbands with traditional views on gender roles and with low educational levels.² [Bobonis et al. \(2013\)](#) study the effects of POP on domestic violence in rural areas, and find that women participating in the program are 5 to 7 percentage points less likely to be victims of physical violence, but 3 to 5 percentage points more likely to be victims of emotional IPV. These effects disappear between 5 and 9 years after the program’s implementation ([Bobonis et al., 2015](#)).

Similarly, [Balmori de la Miyar \(2018\)](#) examines the effects of POP on reporting violence against women to the police. Results show that conditional cash transfers increase the rates of IPV-reporting to the police by 30%, but only in urban areas.

²The PROGRESA-OPORTUNIDADES-PROSPERA data does not contain a module of questions regarding domestic violence. Thus, [Angelucci \(2008\)](#) uses the following question: “while drinking, does this person (referred to the husband) have an aggressive behavior?”

This means that rural households do not exhibit an increase in the rates of reports. According to [Balmori de la Miyar \(2018\)](#), reporting domestic violence to the police ameliorates subsequent IPV for married women living in urban areas. [Hidrobo and Fernald \(2013\)](#) using a randomized control trial that provides public unconditional cash transfers to mothers in Ecuador, shows that being in the treatment group has no effect on emotional and physical IPV. Yet, the program decreases emotional IPV for women with educational levels higher than primary school. In all, these papers find no effects of monetary transfers, conditional or unconditional, on IPV on average, although they do find important heterogeneous effects.

3 Data and Empirical Strategy

3.1 Data

To estimate the effects of remittances on IPV, 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 on violence against women for females who are 15 years old or older, who are married (formally married or cohabiting), who are divorced, separated, or widowed, or who are single. Following the previous literature ([Angelucci \(2008\)](#), [Bobonis, González-](#)

Brenes, and Castro (2013), and Balmori de la Miyar (2018)), we restrict the sample to married women (formally married or cohabiting) and who are between 15 and 60 years old. Thus, the selected sample is 184,153 women.

3.2 Measures

Monetary transfers. The question in ENDIREH regarding remittances asks women whether they receive money from relatives or acquaintances (not including their spouse) living outside Mexico or in the country. For the case of foreign remittances, ENDIREH only distinguishes remittances coming from the United States, whereas the rest of the world is marked as “other countries”. The survey also contains a question that captures whether a household receives monetary transfers from the government through the POP program. This allows us to control and compare results from government’s cash transfers.

Intimate Partner Violence. ENDIREH provides 30 items to measure IPV, classified into four categories: emotional, economic, physical, and sexual. We refer to an incident of violence if it occurred during the last 12 months. Each of these items takes the value of zero if a woman replies “never”, and the value of one if a woman replies “sometimes” or “frequently”. Table B1 presents the prevalence

of each type of IPV for 2006, 2011, and 2016, by groups of monetary transfer beneficiaries: remittances, POP, or neither (see Appendix B). Last, we construct a general measure of IPV, which takes the value of one if a woman experienced any of the four IPV items during the last 12 months, or else, zero.

3.3 Econometric Methodology

To estimate the effect of remittances on domestic violence, we use a fixed effects strategy at the state level as follows:

$$Y_{ist} = \beta_0 + \beta_1 T_{ist} + \beta_2 X_{ist} + \theta_s + \gamma_t + e_{ist}$$

where Y_{ist} is a variable measuring intimate partner violence for women i , in state s and year t ; T_{ist} is a dummy variable that equals one when the household receives remittances, and zero otherwise; 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. To correct for autocorrelation of the outcome - measured across years within a state -, we apply clustered standard errors at the state level. In all, the coefficient of interest is β_1 , which represents the effect of remittances on the likelihood of suffering IPV, in either of its forms, for married women.

In addition to estimating the average effect of remittances on IPV, we calculate

heterogeneous effects with respect to marital arrangements (cohabiting or being formally married), women’s education (completed or did not complete secondary schooling), and women’s ethnicity (speaks an indigenous language). The equation that we estimate is as follows:

$$Y_{ist} = \beta_0 + \beta_1 T_{ist} + \beta_2 D_{ist} + \beta_3 T_{ist} \times D_{ist} + \beta_4 X_{ist} + \theta_s + \gamma_t + e_{ist}$$

where D_{ist} is a dummy indicator that captures variation on marital arrangements, woman’s education or woman’s ethnicity, separately. Notice that β_0 measures the effect of the omitted category, while $\beta_1 + \beta_3$ measure the effect of remittances for couples on each of the heterogeneous categories.

4 Results

4.1 Fixed Effects and Heterogeneous Effects

Panel A, in Table 1, provides descriptive statistics regarding domestic violence by type of monetary transfers. For comparative purposes, once again, we divide the sample into three parts, by women who: (1) receive remittances, (2) receive transfers from POP, or (3) receive no transfer. This table shows in a descriptive manner that women who receive remittances experience more domestic violence (39%) with respect to women receiving conditional cash transfer from POP (33%)

or women who do not receive cash transfers (34%). Panel A also presents information on each of the four IPV categories: emotional, economic, physical, and sexual. Women, who receive remittances, experience emotional and economic IPV the most, followed by those who do not receive transfers, and, finally, followed by women who receive transfers from POP. Regarding physical and sexual violence, women who receive remittances also suffer the most from these types of IPV, followed by women who receive transfers from POP, and, ultimately, followed by women who do not receive transfers. *Prima facie*, these results point to a difference between IPV levels when comparing women who receive remittances to women who receive transfers from POP or to those who do not receive any kind of transfer.

All the previous relations are likely to be affected by omitted variable biases. To partially control for the problem of omitted variables, we use a set of covariates along with a fixed effects strategy. Panels B, C, and D, in Table 1, present information regarding other variables that we use as covariates for all regressions: woman's characteristics, partner's and household's characteristics, and state-level characteristics.³ Moreover, a fixed-effects strategy has the advantage of removing

³Panel B includes information on woman's characteristics such as age, education, ethnicity, employment status, domestic violence during childhood, and the number of times of being married. Panel C presents information on partner's and household's characteristics such as husband's age, husband's education, husband's ethnicity, husband's employment status, number of children, marital arrangements, and type of household (urban or rural area). Finally, Panel D shows information regarding state level characteristics that could affect domestic violence,

omitted variables that are time-invariant. Table 2 contains results for the fixed-effects regressions of remittances on IPV, controlling for the aforementioned sets of covariates, for married women. We find that receiving remittances increases the incidence of IPV by 5.5 percentage points. When breaking the impact of remittances on IPV by type of violence, the results show increases of 5.4, 3.8, 1.5, and 1.2 percentage points for emotional, economic, physical, and sexual violence against women, respectively. All the results above present statistically significant coefficients for a positive effect of remittance on IPV, at the 95% confidence level.

Nonetheless, there is still the possibility of heterogeneous effects. Namely, remittances can have important varying effects on IPV depending on marital arrangements, woman's education or woman's ethnicity. The variable for marital arrangements captures couples that cohabit, using a dummy variable that takes the value of one when the wife reports that she is not formally married, or else zero. The variable regarding woman's education is also a dummy variable that takes the value of one when the wife reports having completed secondary education or more, and zero, otherwise. Finally, the variable for women's ethnicity is a dummy variable that takes the value of one whenever a woman speaks an indigenous language, and zero otherwise. Table 3 presents findings for heterogeneous

including homicide rates, sex ratio, gross domestic product per capita, inequality (measured by the Gini coefficient), and unilateral divorce laws.

effects of remittances on IPV, estimated by urban and rural areas in order to compare the results with the existing literature. The heterogeneous results for rural households (columns 1, 2 and 3) indicate an increase in the likelihood of IPV for women who cohabit (1.8%), a decrease for women with more education (-3.4%) and a decrease for indigenous women (-3.5%). However, none of these coefficients are statistically significant at the 95% level of confidence. On the other hand, findings on heterogeneous effects for urban areas (columns 4, 5, and 6) show that remittances increase the probability of IPV for women who cohabit (3.4%) and for women with more education (1.6%), while remittances decrease IPV when the woman speaks an indigenous language (1.9%); yet, only the cohabiting heterogeneous effect shows a statistically significant coefficient at 95% level of confidence. One key aspect to note is that the impact of remittances on IPV is larger in urban areas than it is in rural areas, although both are statistically significant and move in the same direction. In all, we conclude that heterogeneous effects are not significant.

4.2 Robustness Tests

State-fixed effects account for unobserved time-invariant characteristics across states; however, it is still possible that unobserved time-variant characteristics

affect the results. To check the robustness of the results, we use four different tests: (1) a bounding approach, (2) a pair cluster bootstrap-t procedure, (3) a decomposition of remittances by origin of remitter and (4) heterogenous effects for households that receive both remittances and POP, at the same time. All four tests verify different components of the results above to shield them against possible biases.

Our first test consists of a bounding approach, proposed by [Altonji et al. \(2005\)](#) and refined by [Oster \(2017\)](#). This robustness strategy implicitly assumes that selection on observables is informative about selection on unobservables. By providing conditions for bounds and identification, Oster (2017) formalizes the bounding approach idea. Namely, the author sets minimums of expected R-squared for simulated regression with unobservables. If the bounds exclude zero, then the results from the regression above are robust to omitted variable biases (see Appendix A). Table 4 contains the results of the bound approach test. Column 1 shows the range for the effect of remittances on IPV, yielding a very tight bound of [0.054, 0.056]. In addition, we estimate the ranges for each type of IPV: the bounding for emotional violence is [0.052, 0.055]; for economic violence, [0.037, 0.039]; for physical violence, [0.014, 0.016], and for sexual violence, [0.009, 0.015]. None of the previous bounds include zero, while all of them keep positive ranges. All these

suggest that the results from the fixed effects strategy are robust to the problem of omitted variables.

The second robustness test is regarding the standard errors using fixed effects. [Cameron et al. \(2008\)](#) suggest that with a low number of clusters (five to 30), standard errors are downward-biased. Although we have 32 clusters at the state level, we conduct a pair cluster bootstrap-t procedure as described in [Cameron et al. \(2008\)](#). [Table 5](#) reproduces the results of [Table 2](#) using a pair cluster bootstrap-t procedure to calculate standard errors. Under this method, [Table 5](#) shows that all coefficients remain statistically significant at the 95%-level of confidence.

A third robustness test consists in dividing remittances by origin of the remitter into two: remittances from outside Mexico and remittances from within Mexico. This offers evidence to guarantee that the nature of transfer for the recipient household is the same, regardless of the origin of remitter. [Table 6](#) indicates that the coefficients for remittances from outside the country (5.8%) are basically the same as remittances from within the country (5.2%). What is more important is that all results, except for physical IPV on foreign remittances, remain statistically significant.

Finally, our fourth robustness test explores the possibility of heterogenous effects on women who receive both remittances and transfers from POP, at the same time. Table 7 includes a dummy variable that controls for women who received remittances and POP at the same time. The results show that the coefficient associated with remittances remains statistically significant, regarding its effects on domestic violence: IPV (0.060), emotional (0.062), economical (0.041), physical (0.018), and sexual (0.013). The coefficient associated with the interaction between remittances and POP is negative: IPV (-0.029), emotional (-0.040), economical (-0.015), physical (-0.017), and sexual (-0.08); and statistically significant for IPV, emotional, and physical. These results suggest an inverted-U relationship between IPV and monetary transfers. IPV levels are low when transactions are “small” (receiving only POP), increase when the transfers are “moderately” large (remittances), and decrease when they are relatively “high” (remittances and POP).

4.3 Household Dynamics

Why do remittances affect IPV levels for married women? Why do government’s conditional cash transfer programs (like POP) have no effect, on average, on domestic violence for married women? To solve these questions, we analyze three

possible explanations based on household dynamics: (1) a decline in husbands' labor supply, (2) an increase in husbands' consumption of alcohol, and (3) a shift in wives' bargaining power.

Our first hypothesis relates to the effects of monetary transfers on the labor supply of men for recipient households. This hypothesis has two components: (1) when women receive remittances, men can extract part of that income exerting IPV (Bloch and Rao, 2002), and (2) assuming that leisure is a normal good, the additional income from remittances translates into a decrease on men's labor supply. Column 1, in Table 8, indicates that transfers via remittances decrease the probability that the husband currently works by 8 percentage points. These results hold true for both rural areas (column 2) and urban areas (column 3). Namely, the decomposed effects of remittances on men's labor supply in urban and rural households are 9.5% and 6.2%, respectively. Said effects go hand-on-hand with the impacts of remittances on IPV in Table 3, in which the coefficients in urban areas are also larger than in rural areas. Furthermore, there is no conclusive evidence that transfers through POP affect the labor supply of men in recipient households.⁴ This may be the main reason why there is an effect on IPV for remittances and not for POP.

⁴POP transfers seem to have a negative effect on the labor supply of men only in urban areas (1.1%). Of course, said effect is rather small compared with that of remittances.

A second explanation for a positive effect of remittances on IPV is an increase in men's consumption of alcohol, due to a raise in disposable income. Existing literature suggests that husband's alcohol consumption is related with IPV ([Testa, Quigley, and Leonard \(2003\)](#) and [Brecklin \(2002\)](#)). Our survey, ENDIREH, explicitly asks whether there is an increase in marital conflicts due to the husband's consumption of alcohol. Table 9 shows that remittances increase the probability of marital conflicts due to the husband's consumption of alcohol by 3.8%. When decomposed by area, the effect again is larger in urban households (4.1%) than in rural households (2.7%). Moreover, when compared with the effects of POP on marital conflicts due to the husband's consumption of alcohol (2.2%), the effect is once again larger for remittances.

Last, we analyze a third possibility for why remittances affect IPV: a shift in women's bargaining power within the household. The literature proposes two contrasting theories. On the one hand, remittances may increase the bargaining power of women within the household ([Chiappori et al., 2002](#)). On the other hand, [Macmillan and Gartner \(1999\)](#) suggest that when the balance of power in relationships within the household shifts, men may choose to increase their bargaining power and exert violence to re-establish social norms of male dominance

(male back-lash theory). To measure bargaining power, we use decision-making within the household as a proxy; in particular, we use six items related to household decision-making: (1) to work or study, (2) to leave the house, (3) to use money in general, (4) to buy things for yourself, (5) to participate in the social or political life of your community, and (6) to have sex. Each of these items take the value of one if the woman participates in the decision jointly (with her partner) or by herself, and zero otherwise. Then, we generate a standardized index (mean zero and standard deviation of one), using the first principal components of all these items. Table 10 indicates that remittances decreased women's bargaining power by 0.06 standard deviations. When decomposing the effect into areas, coefficients remain significant only for urban households. Here again, there is no conclusive evidence that transfers from POP impact women's bargaining power; thus, this variable could also be an indication for a zero-effect of POP on IPV, as opposed to the impact for remittances.

5 Conclusion

This paper analyzes the effects of remittances on IPV for married women living in Mexico. Using fixed effects at the state level, we find that remittances increase the probability of suffering IPV by 5.5 percentage points. Moreover, we find that receiving remittances increases the likelihood of IPV by 5.4, 3.8, 1.5, and 1.2 percentage points for emotional, economic, physical, and sexual violence against women, respectively. These results are robust to a series of tests, including a bounding methodology proposed by Oster (2017), wild cluster bootstrapped standard errors, and the origin of the remittances.

In addition, we find evidence of three potential household dynamics contributing to this effect: (1) a decline in husbands' labor supply, (2) an increase in husbands' consumption of alcohol, and (3) a decrease in wives' bargaining power. The results show the following: first, remittances decrease the probability of men being employed by 8.3 percent points; still, there is no evidence that transfers through the conditional cash transfer Progresa-Oportunidades-Prospera (POP) affect the employment status of married men. Second, remittances increase the probability of marital conflicts due to the husband's consumption of alcohol by 3.8%, while this percentage is 2.2% in the case of transfers from POP. And third, remittances decrease women's bargaining power by 0.06 standard deviations; yet, we do not find

any evidence that transfers from POP impact women's household decision-making.

In terms of public policy, there is an important debate about the potential consequences of monetary transfers as potential triggers of IPV for married women. Evidence from conditional cash transfers suggests heterogeneous effects in which small transfers decrease IPV, whereas large transfers increase IPV (Angelucci, 2008). In the case of remittances, our findings support the hypothesis that when the amount of the cash transfer is relatively high, said aid increases the probability of IPV for married women. In this sense, policymakers should be careful when designing public policies that involve monetary transfers. At the very least, policymakers should have a clear gender agenda that mitigates any undesirable consequence of conditional or unconditional cash transfers.

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6 Tables

Table 1: Descriptive Statistics

	Remittances %	PROSPERA %	No Cash Transfers %
Panel A. Domestic violence			
Intimate Partner Violence (IPV)	0.39	0.33	0.34
Emotional IPV	0.33	0.27	0.29
Economic IPV	0.22	0.17	0.18
Physical IPV	0.10	0.09	0.07
Sexual IPV	0.06	0.05	0.03
Panel B. Female characteristics			
Woman's age	44.45	39.12	38.75
Woman's Education: 1 Secondary or more 0 Primary or no schooling	0.44	0.37	0.71
Indigenous Woman	0.08	0.21	0.04
Woman's work	0.30	0.27	0.45
Blows in your family of origin: 1 Yes 0 No	0.32	0.33	0.27
You were beaten in your family of origin	0.42	0.40	0.37
Insults in your family of origin	0.25	0.24	0.20
Number of times married	1.13	1.11	1.11
Panel C. Partner and household characteristics			
Partner's age	48.79	43.13	42.09
Partner's Education: 1 Secondary or more 0 Primary or no schooling	0.44	0.33	0.72
Indigenous Partner	0.08	0.22	0.05
Partners's work	0.80	0.92	0.93
Children 18 years old or less	1.16	2.28	1.43
Cohabiting couple	0.22	0.27	0.23
Panel D. State characteristics			
Homicides per 100,000 inhabitants	19.58	18.76	18.44
Sex ratio (males to females)	103.33	104.27	103.04
GDP	11.66	11.61	11.74
Inequality (Gini coefficient)	0.47	0.48	0.47
Unilateral Divorce: 1 Yes 0 No	0.21	0.32	0.29
Rural: 1 Yes 0 No	0.29	0.59	0.14

Source: National Survey on Relationships within the Household

Table 2: FE Estimates: Effects of Remittances on Domestic Violence

	(1) IPV	(2) Emotional	(3) Economical	(4) Physical	(5) Sexual
Remittances	0.055*** (0.009)	0.054*** (0.008)	0.038*** (0.006)	0.015*** (0.004)	0.012*** (0.003)
PROGRESA	-0.001 (0.004)	-0.001 (0.003)	-0.001 (0.004)	0.007*** (0.002)	0.005*** (0.002)
Female characteristics	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.09	0.07	0.06	0.04	0.03
Observations	182743	182735	182725	182732	182696

Note: Standard errors clustered at the state level in parentheses. 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 or equal than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Heterogeneous Effects of Remittances on Domestic Violence with respect to cohabiting, women's education, and men's education

	Rural			Urban		
	(1)	(2)	(3)	(4)	(5)	(6)
Remittances	0.024** (0.010)	0.037*** (0.013)	0.038*** (0.011)	0.057*** (0.012)	0.056*** (0.011)	0.054*** (0.010)
Remittances \times Cohabiting couple	0.018 (0.026)			0.034** (0.016)		
Remittances \times Woman's Education: 1 Secondary or more 0 Primary or no schooling		-0.034 (0.028)			0.016 (0.017)	
Remittances \times Indigenous Woman			-0.035* (0.020)			-0.019 (0.023)
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	0.08	0.08	0.08	0.09	0.09	0.09
Observations	38970	38970	38970	143773	143773	143773

Note: Standard errors clustered at the state level in parentheses. Female characteristics include age, education, speak an indigenous language, participating in PROGRESA, 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 equal or less than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Bounding Methodology: Effects of Remittances on Domestic Violence

	(1)	(2)	(3)	(4)	(5)
	IPV	Emotional	Economic	Physical	Sexual
Remittances	[0.054,0.056]	[0.052,0.055]	[0.037,0.039]	[0.014,0.016]	[0.009,0.015]
Female characteristics	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.09	0.07	0.06	0.04	0.03
Observations	182743	182735	182725	182732	182696

Note: Female characteristics include age, education, speak an indigenous language, participating in PROGRESA, 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 or equal than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: FE Estimates: Effects of Remittances on Domestic Violence - Wild Cluster Bootstrapped Standard Errors

	(1)	(2)	(3)	(4)	(5)
	IPV	Emotional	Economic	Physical	Sexual
Remittances	0.055 [0.035,0.074]	0.054 [0.035,0.072]	0.038 [0.025,0.050]	0.015 [0.006,0.024]	0.012 [0.006,0.017]
Female characteristics	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.09	0.07	0.06	0.04	0.03
Observations	182743	182735	182725	182732	182696

Note: Confidence interval's using wild cluster bootstrapped standard errors are in brackets. Female characteristics include age, education, speak an indigenous language, participating in PROGRESA, 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 and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Prevalence of IPV by type

	(1)	(2)	(3)	(4)	(5)
	IPV	Emotional	Economical	Physical	Sexual
Remittances USA	0.058*** (0.009)	0.050*** (0.009)	0.036*** (0.010)	0.010 (0.006)	0.016*** (0.004)
Remittances MEX	0.052*** (0.010)	0.056*** (0.010)	0.037*** (0.007)	0.016*** (0.006)	0.010*** (0.004)
PROGRESA	-0.001 (0.004)	-0.001 (0.003)	-0.001 (0.004)	0.007*** (0.002)	0.005*** (0.002)
Female characteristics	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.09	0.07	0.06	0.04	0.03
Observations	182789	182781	182771	182778	182742

Note: Standard errors clustered at the state level in parentheses. 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 or equal than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: FE Estimates: Effects of Remittances and PROGRESA on Domestic Violence

	(1)	(2)	(3)	(4)	(5)
	IPV	Emotional	Economical	Physical	Sexual
Remittances	0.060*** (0.010)	0.062*** (0.009)	0.041*** (0.007)	0.018*** (0.005)	0.013*** (0.003)
PROGRESA	0.001 (0.004)	0.001 (0.003)	-0.001 (0.004)	0.007*** (0.002)	0.005*** (0.002)
Remittances × PROGRESA	-0.029* (0.015)	-0.040*** (0.013)	-0.015 (0.010)	-0.017** (0.007)	-0.008 (0.008)
Female characteristics	Yes	Yes	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.09	0.07	0.06	0.04	0.03
Observations	182743	182735	182725	182732	182696

Note: Standard errors clustered at the state level in parentheses. 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 or equal than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Mechanism (1): Effects of Remittances on Partner's Work

	Partner's work		
	(1) Total	(2) Rural	(3) Urban
Remittances	-0.083*** (0.009)	-0.062*** (0.011)	-0.095*** (0.009)
PROSPERA	-0.003 (0.003)	-0.000 (0.004)	-0.011*** (0.003)
Partner/household	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes
R^2	0.07	0.04	0.09
Observations	183100	39021	144079

Note: Standard errors clustered at the state level in parentheses. Partner and household characteristics include partner's age, education, and speaking an indigenous language. In addition, children less or equal than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural.
 * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Mechanism (2): Effects of Remittances on Marital Conflicts due to Husband's Consumption of Alcohol

	Husband's Consumption of Alcohol		
	(1)	(2)	(3)
	Total	Rural	Urban
Remittances	0.038*** (0.005)	0.027*** (0.006)	0.041*** (0.006)
PROSPERA	0.022*** (0.002)	0.018*** (0.004)	0.031*** (0.004)
Female characteristics	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes
R^2	0.04	0.04	0.04
Observations	182744	38971	143773

Note: Standard errors clustered at the state level in parentheses. 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 or equal than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Mechanism (3): Effects of Remittances on Women’s Decisions within the Household

	Women’s Decisions within the Household		
	(1)	(2)	(3)
	Total	Rural	Urban
Remittances	-0.066*** (0.019)	-0.028 (0.033)	-0.073*** (0.023)
Cash Transfers (PROSPERA)	-0.009 (0.011)	0.045** (0.018)	-0.025** (0.011)
Female characteristics	Yes	Yes	Yes
Partner/household	Yes	Yes	Yes
State characteristics	Yes	Yes	Yes
State/Year FE	Yes	Yes	Yes
R^2	0.07	0.09	0.05
Observations	142597	27554	115043

Note: Standard errors clustered at the state level in parentheses. 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 or equal than 18 years old and cohabiting status. State characteristics include homicides per 100,000 inhabitants, sex ratio, log (GDP per capita), inequality(Gini coefficient), unilateral divorce, and rural. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

7 Appendix [A]

Following the notation in Oster, the full model takes the following form:

$$Y = \beta T + X_1 + X_2 + \epsilon.$$

where T is the variable of interest, X_1 contains the *observed* control variables multiplied by their coefficients, i.e., $X_1 = \sum_{j=1}^{J_o} X_j^o \gamma_j^o$, and X_2 contains all *unobserved* variables multiplied by their coefficients, i.e., $X_2 = \sum_{j=1}^{J_u} X_j^u \gamma_j^u$. Finally, ϵ is a random error representing the measurement error in Y , and is uncorrelated with X_1 , X_2 and T . Oster suggests the following approach to account for omitted variable bias:

(1) Regress Y on T , and report the parameter on T , denoted by β^0 , and the R-squared coefficient, denoted by R^0 .

(2) Regress Y on T and X_1 , and report the parameter on T , denoted by $\tilde{\beta}$, and the R-squared coefficient, denoted by \tilde{R} .

(3) Define R_{max} as the overall R-squared of the model, that is, the R-squared that would be obtained from a regression of Y on both observables (T , X_1) and

unobservables (X_2).

(4) Define δ to be a parameter that ensures equality $\frac{Cov(T, X_2)}{Var(X_2)} = \delta \frac{Cov(T, X_1)}{Var(X_1)}$. In other words, this relationship formalizes the idea of [Altonji et al. \(2005\)](#) 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 . For example, if $-1 \leq \delta \leq 1$, then the variable of interest (T) is no more correlated with the unobservables (X_2) than it is correlated with the observables (X_1). The case $0 \leq \delta \leq 1$ has a similar interpretation, with the additional assumption that the relationship between T and X_1 has the same sign as the relationship between T and X_2 .

Oster shows that $\beta^* \approx \tilde{\beta} - \delta \frac{(\beta^0 - \tilde{\beta})(R_{max} - \tilde{R})}{(\tilde{R} - R^0)}$ is a consistent estimator of the effect of T on Y, β . It should be noted that this is a close approximation to the consistent estimator and is used to present the intuition regarding the methodology. The complete approximation is presented in [Oster \(2017\)](#).

In order to estimate β^* , estimates of δ and R_{max} are required. Oster proposes assumptions for δ and R_{max} that allows one to determine whether β^* is different to zero. Oster proposes that $R_{max} = \min\{1.3\tilde{R}, 1\}$, where \tilde{R} is as defined above. The

cut-off value of 1.3 is derived from a sample of papers containing randomized controlled trials and nonrandomized data, and published in the *American Economic Review*, *Quarterly Journal of Economics*, *The Journal of Political Economy*, and *Econometrica* from 2008-2010. She determined that using this cut-off allowed 90% of the randomized and 50% of the nonrandomized results to continue being statistically significant. After determining the value of R_{max} , Oster suggests that β^* be calculated for all the following ranges of δ : $0 \leq \delta \leq 1$ (the current paper also presents the results for δ : $-1 \leq \delta \leq 0$), enabling the construction of the set: $[\tilde{\beta}, \beta^*]$. 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 $\beta^* \neq 0$.

8 Appendix [B]

Table B1: Prevalence of IPV by type

	Remittances %	PROSPERA %	No Cash Transfers %
Physical IPV			
pushed you or pulled your hair?	0.07	0.07	0.06
tied you up?	0.00	0.00	0.00
kicked you?	0.02	0.02	0.01
thrown any object at you?	0.03	0.02	0.02
beaten you with his hands or any object?	0.06	0.05	0.04
tried to hang or choke you?	0.01	0.01	0.01
assaulted you with a knife or blade?	0.01	0.01	0.00
fired a weapon at you?	0.00	0.00	0.00
Emotional IPV			
shamed, underestimated or humiliated you?	0.10	0.10	0.09
ignored or not show you affection?	0.12	0.08	0.09
said you cheat on him?	0.08	0.07	0.06
made you feel fear?	0.06	0.06	0.05
threatened to leave you, hurt you, take your children away or kick you out?	0.09	0.08	0.06
locked you in, forbidden you from going out or being visited?	0.03	0.03	0.02
turned your children or relatives against you?	0.03	0.02	0.02
have spied on you?	0.03	0.02	0.02
threatened you with a weapon?	0.01	0.01	0.00
threatened to kill you, himself or the children?	0.02	0.02	0.01
destroyed, thrown away or hidden things belonging to you or the household?	0.04	0.03	0.03
stopped talking to you?	0.21	0.14	0.18
got angry because household chores are not done like he wants?	0.11	0.09	0.09
Economic IPV			
complained about how you spend money?	0.11	0.09	0.11
been stingy with the household expenses, even though he has money?	0.09	0.06	0.07
not given you the unkeep or threatened you to not giving it?	0.07	0.05	0.04
spent money needed for the household?	0.07	0.06	0.05
appropriated or taken money or possessions from you?	0.01	0.01	0.01
forbidden you to work or study?	0.07	0.06	0.06
Sexual IPV			
demanding you to have sexual relations?	0.05	0.04	0.03
forced you to have sexual things you do not like?	0.02	0.02	0.01
used physical strength to force you to have sexual relations?	0.02	0.02	0.01

Source: National Survey on Relationships within the Household