DOMESTIC VIOLENCE AND WOMEN'S EARNINGS IN MEXICO

VIOLENCIA DOMÉSTICA E INGRESOS LABORALES DE LAS MUJERES EN MÉXICO

Edith Aguirre

University of Essex

Resumen: Este artículo presenta el primer análisis empírico sobre la relación entre la violencia doméstica y los ingresos laborales de las mujeres en México, país en el que este tema no ha recibido mucha atención dentro de la literatura económica a pesar de las crecientes tasas de violencia de género. Los resultados muestran una asociación negativa y significativa entre la violencia doméstica y los ingresos laborales de las mujeres en México para todos los tipos de abuso y con independencia de la medición de violencia de pareja que se utilice.

Abstract: This paper provides the first empirical analysis on the relationship between domestic violence and women's earnings in Mexico, a country where research on intimate partner violence has not yet received much attention in the economic literature despite the increasing rates in gender-based violence. An index for domestic violence is also created, challenging the traditional dichotomous measure used within this context. Findings reveal a negative and significant association between domestic violence and women's earnings in Mexico for all types of intimate partner violence and independent of the IPV measure used.

Clasificación JEL/JEL Classification: J12, J16, D10

Palabras clave/keywords: domestic violence; intimate partner violence; marriage; earnings; female labor-force participation

Fecha de recepción: 24 II 2022 *Fecha de aceptación: 13 IV 2022*

https://doi.org/10.24201/ee.v38i1.438

 https://doi.org/10.24201/ee.v38i1.438

1. Introduction

Domestic violence is a serious global challenge. Although its prevalence varies between societies, there are no countries with all the potential mechanisms set in place to fully prevent intimate partner violence.[1] A major concern is how to modify social norms to eradicate women's acceptance of domestic abuse. According to the Social Institutions and Gender Index (SIGI), domestic violence is justifiable by one in three women across 108 countries (OECD, 2014). Women are at risk regardless of their country of origin, level of education, age or labour status. In addition, estimations for Australia, Brazil, the United Kingdom, and Vietnam indicate an economic loss from 1% to 2% of gross domestic product due to costs associated with domestic abuse (Duvvury *et al.*, 2012; WHO and CDC, 2008; Walby, 2004; Access Economics, 2004). Furthermore, at the individual level, intimate partner violence (IPV) has severe and sometimes fatal consequences on physical and mental health, jeopardizing women's productivity in the labour market (United Nations, 2015).

Mexican female labour market participation is below the average for OECD countries with the second-lowest rate only after Turkey. Barriers for women to join and remain in the workforce in Mexico are several. In addition to low salaries, long commutes and an employment legislation that needs to be improved in terms of gender and parenting; employees in Mexico are expected to work at least ten hours daily (regardless the 8-hour cap established in most workplaces). Around 60% of the population believe female breadwinners pose a threat to household stability. A lack of adequate supply of childcare for young children exists and rates of violence against women continue to be alarming (OECD, 2017). All these factors represent extra difficulties for women to participate in the labour force. Adding to the list, the low levels of educational attainment, the high dropout rates, the poor-quality teaching, and the lack of financial resources have been preventing education to be a stronger catalyst to positively improve women's condition in the labour market and in the country (Aguirre, 2022).

Moreover, in terms of gender-based violence, 7.5 women were killed every day in Mexico in 2016. Since 2011, femicide rates have

[1] In a broader sense, the term "domestic violence" can be used to indicate any type of abuse in a domestic setting whereas the term "intimate partner violence" is only used when violence is inflicted by one spouse or partner against the other. Both terms are used indistinctively throughout this paper, referring to violence within a couple, perpetrated by a man to a woman.

been at their highest levels with 4.6 women murdered by every 100 000 women in 2011 and 2012, against 1.9 women murdered by every 100 000 in 2007, the lowest rate recorded over the last 30 years. During the 2012-2016 period, a rise in the number of murdered women aged 20 to 40 years old -specifically during women's reproductive age- reveals an important change in the structure of women's homicides and might be considered an indicator of the increasing levels of IPV suffered by women (Echarri, 2017).

A partner should be someone to rely upon and trust. However, women are more likely to suffer violence from intimate partners/family than by any other type of perpetrators. Global data indicates that almost 50% of all murdered women in 2012 died at the hands of their partners or family, but less than 6% of men were killed under these circumstances (UNODC, 2013).

Data for Mexico show around 45% of women in a relationship have experienced intimate partner violence (INEGI, 2006, 2011, and 2016). Furthermore, 78.6% of Mexican women suffering physical abuse from partners never reported the incident (INEGI, 2016). While 28.8% of these women suggested the violent episode was not relevant enough to be disclosed, many others did not come forward because they were afraid, ashamed, did not know how or where to file the complaint or did not trust the authorities. On top of that, 35% of these women reported having suffered physical damage, mainly in the form of bruises or inflammation, but also as haemorrhages, bleeding, burns, lost teeth, and fractures, amongst others (INEGI, 2016).

Mexico ranks 81^{st} in the Global Gender Gap Index (only above Brazil, Paraguay, and Guatemala from the Latin American region), and the position drops to 124th when considering the Economic Participation and Opportunity subindex (WEF, 2017). This is not surprising. Compared to other countries, Mexico's legislation protecting and enforcing women's rights has lagged behind and for instance, only recently, unilateral divorce has been adopted in the country (Aguirre, 2019). Additional efforts are needed to reduce discrimination against women at all levels in terms of justice, security, employment, health, education, and social protection. Challenging tasks are to improve women's current conditions and to modify attitudes towards them at very young ages, at school, and at home. Otherwise, women will continue to be trapped in a cycle of violence affecting not only women, but the Mexican society as a whole (OECD, 2017).

The main contributions of this study are twofold. First, an empirical analysis is provided on the association between domestic violence and women's earnings in Mexico, a country where research on

intimate partner violence has not yet received much attention in the economic literature despite the increasing rates of gender-based violence. Second, the traditional measure of domestic violence is challenged, suggesting the use of an index as a more flexible definition that allows the incorporation of readily available information into the analysis. It is not expected to be perfect, but it is an effort to introduce and highlight the importance of considering the frequency of domestic abuse.

The relationship between earnings and intimate partner violence has previously been studied in other countries (Vyas, 2013; Duvvury *et al.*, 2012; Sanchez and Ribero, 2004; Morrison and Orlando, 1999). However, to the best of my knowledge, none has considered a variation in the frequency and magnitude of domestic violence women have been exposed to as an alternative measure to IPV. Rather, most analyses are conducted comparing women who have suffered IPV at least once against women who have never been abused. This is an understandable strategy followed by researchers given the official United Nations definition of violence against women: "any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life" (UNGA, 1993). Furthermore, the frequency of IPV is not easy to track and how to create an adequate indicator of domestic violence is an even more difficult task.

This paper does not intent to diminish the severity of domestic abuse irrespective of its frequency and magnitude, so it is important to explicitly mention that intimate partner violence must be rejected at all levels. However, women trapped in a vicious cycle of abuse might be particularly susceptible to the effects of IPV on their productivity, the framework this paper intends to highlight.

The analysis is conducted for Mexico using the National Survey on the Dynamics of Household Relationships (*Encuesta Nacional sobre la Dinámica de las Relaciones en los Hogares*, ENDIREH) of 2016 and 2006.

Findings reveal that intimate partner violence reduces women's earnings in Mexico for all types of domestic abuse, economic, emotional, or physical, and independent of the IPV measure used. Emotional abuse has the greatest impact of all types of violence for Mexican women. A one standard deviation increase in the emotional violence index reduces earnings on average by 1.5%. Likewise, a one standard deviation increase in the physical violence index and the economic violence index reduces earnings on average by 1% and 0.9%,

respectively. If the "traditional" measure of IPV is adopted (any form of abuse), the results show that women with at least one incident of emotional violence earn on average 4% less than women who have never been abused. Using this same definition, earnings also decrease by 3.6% for physical violence and 2.3% for economic violence. Although the estimations obtained from these two different approaches are not directly comparable, calculations for a hypothetical case reveal that average earnings are reduced by 9.7% for a woman facing the highest level of emotional abuse when using the IPV index instead of the traditional measure.

The rest of the article is organised as follows. Section 2 presents the literature review. Section 3 describes the data. Section 4 discusses the estimation strategy, and section 5 presents the results. Section 6 set out conclusions.

2. Literature review

From a theoretical perspective, there are two main opposite models on the prevalence of intimate partner violence. The household bargaining model suggests that women with more economic opportunities (such as higher wages) can bargain for better outcomes in the household, experiencing less IPV. On the other hand, the male backlash model argues women are more likely to experience IPV when they have more resources available, as an attempt from men to exert dominance (Guarnieri and Rainer, 2018). In any case, the mechanism through which IPV affects earnings is very straightforward. Women suffering intimate partner violence are more likely to experience depression, substance abuse, female reproductive disorders, sexually transmitted infections, low back pain, headaches, gastroesophageal reflux disease, amongst others (Anderson *et al.*, 2003; Martin *et al.*, 2008; Bonomi *et al.*, 2009); conditions seriously compromising job performance for those in the labour market.

Very few empirical studies have analysed the relationship between earnings and domestic violence. One of the earliest papers studies two Latin American countries, Chile and Nicaragua (Morrison and Orlando, 1999). Findings indicate domestic abuse is related to lower women's monthly earnings. Abused women in Chile and Nicaragua earn, on average, 34% and 46% less -respectively- than women who have never been exposed to IPV. Although the authors mention the results using different types of domestic violence show a negative and significant effect on earnings, they do not provide

any additional information to identify the type of violence with the strongest negative impact on earnings.

Vyas (2013), using Propensity Score Matching (PSM) methods, identifies the effects of intimate partner violence on earnings for women working in formal waged work and non-agricultural self-employment in Tanzania. General findings show lower earnings for abused women when compared to women never exposed to IPV. The author indicates that the largest female employment sector in Tanzania is agricultural self-employment, but it was not included in the analysis because data was unavailable.

Sabia *et al.* (2013) strongly control for a wide range of community, school, family, and individual levels of heterogeneity in a related context. Although the paper does not address intimate partner violence but sexual assault, it is found that hourly wages for young adult women who reported sexual violence are 5.1% lower compared to earnings from women who were never sexually abused.

For the particular case of Mexico, no previous studies have analysed the association between domestic violence and women's earnings. An influencing paper by Bobonis *et al.* (2013) compares the effects of conditional cash transfers on domestic violence for beneficiary women enrolled in the Mexican program *Oportunidades*[2] to non-beneficiary women. IPV is categorised as physical, sexual, or emotional abuse. Results reveal beneficiary women are less likely to experience physical abuse as an improvement in their bargaining power. Still, they are also more likely to suffer emotional violence, possibly as an alternative used by male partners to reposition themselves as the dominant figure within the household.

Domestic violence studies are typically conducted using as a measure of IPV an indicator with only two options, abused or not abused. Erten and Keskin (2018) provide an interestingly different approach to analyse the effect of education on domestic violence in Turkey. Although the standardized IPV index developed does not capture different levels of violence inflicted, it is a remarkable introduction to the traditional measure of domestic violence used in the literature. It also provides the basis for the IPV indicator proposed in this paper, further explained in section 3.1.

[2] *Oportunidades* used to be the main anti-poverty government social program in Mexico.

3. Data

To study the relationship between domestic violence and women's earnings, the analysis is based on the ENDIREH of 2016 and 2006. The ENDIREH has been strategically designed to obtain information about the frequency and magnitude of violence experienced by women within the household and to identify events of discrimination, aggression, and violence at school, at work, or in their families and communities. It is a cross-sectional national survey of women aged 15 and over in Mexico, led by the National Institute of Statistics and Geography (*Instituto Nacional de Estadística y Geografía*, INEGI).

The ENDIREH is the only survey with national representative data about gender-based violence in Mexico, but a compromise needs to be made when using it. The survey provides information about total net weekly, fortnightly, or monthly earnings. However, the total hours employed is unknown, restricting the dependent variable to be monthly earnings instead of hourly earnings. While this could be considered a disadvantage in studies for developed countries where minimum wages are usually set on an hourly basis, for the case of Mexico, with a minimum wage established at 73.04 Mexican pesos per 8-hour workday in 2016,[3] it might be less of a problem. Nonetheless, it is important to explicitly mention this paper identifies the relationship between domestic violence and monthly earnings reported by women.

The target subpopulation is married women currently living with their husbands. Employed and non-employed women are both considered in the analysis.[4]

3.1 *Measuring domestic violence*

Domestic violence is classified in three different types: economic, emotional, and physical, according to a particular set of questions for each classification.[5] All questions have three possible outcomes identifying how frequently the woman has experienced that particular abuse in

[3] According to SEGOB (2015).

[4] Classification has been made using the question: Are you currently employed and getting a payment for it? If the answer is yes, the woman is considered employed. If the answer is no, she is considered non-employed. Earnings equal to zero have been imputed to non-employed women.

[5] Survey questions are grouped by type of domestic violence in table 7 of the Appendix. There are some differences between the questions asked in the ENDIREH 2006 and 2016. Efforts were addressed to match both surveys.

the last 12 months from her partner: more than once, only once or never.[6] One variable is created for every question. If the woman has never suffered the abuse stated in the question, the variable takes the value of 0; if she has suffered that abuse one time, the variable takes the value of 1; and if she has been abused in that way more than once, the variable takes the value of 2. Once a variable with three levels (0, 1, or 2) is created for each question, the next step is to obtain the violence magnitude by adding up the different levels by question within each type of domestic violence.

The number of questions by category varies. For example, there are 13 questions identifying emotional violence but only six questions related to economic violence; then, emotional violence can go up to 26 points, whereas economic violence only reaches 12 points as a maximum. To adjust for the differences in the number of questions per type of IPV, the final index is calculated from standardizing the magnitude of each type of violence. As a result, three indexes are constructed: the economic violence index, the emotional violence index and the physical violence index. All with mean zero and standard deviation 1. This approach allows us to analyse the effect that one standard deviation increase (or decrease) in any of the indexes on domestic violence has on earnings, considering at the same time the frequency and magnitude of violence and not only identifying if the woman has experienced any act of abuse.

In addition, for each type of domestic violence, estimations are performed using the traditional binary variable that takes the value of one if the woman has responded "one time" to at least one of the questions identifying that type of domestic violence or taking the

[6] The ENDIREH 2016 has four different categories to determine the level of abuse: very often, a few times, only once or never. A difficulty arises when trying to record "very often" and "few times". While the difference from never abused to abused once is very straightforward, just one jump in the unit of measurement, it is not specified if for example few times is less than ten times or five times; or if very often is more than five times or ten times. The breaking point between "very often" and "few times" is not clear, and self-perception of the woman plays an even more important role. Some women could have reported ten times as few times and others could have reported it as very often. To overcome this challenge, the decision taken is to merge both categories into one, because what is known for sure is that few times and very often is more than one time. Thus, the variable takes the value of 2 if the woman has reported very often or few times in the ENDIREH 2016, indicating a woman experiencing that type of abuse two or more times.

value of zero if she has responded "never abused" to all the questions.

Estimations are also provided using a third alternative measure of domestic violence. An indicator variable with three categories. One category identifies if the woman has responded "more than once" to at least one of the questions related to that type of domestic violence. Another category identifies if the woman has responded "one time" to at least one of the questions but has never responded "more than once" to any of the questions. And a final category identifies if she has responded "never abused" to all the questions.

3.2 *Summary statistics*

The final sample consists of 89 396 married women (41.87% from the ENDIREH 2016 and 58.13% from the ENDIREH 2006) aged 22 to 60.[7] A total of 33 286 women are employed, and 56 110 women are non-employed.

Table 1
Summary statistics - Intimate partner violence

Type of intimate partner violence	*Employed women*	*Non-employed women*
	%	%
Economic violence	18.3	16.1
Emotional violence	29.7	25.2
Physical violence	10.4	9.0
Total	33 286	56 110

Notes: The table shows the percentage of employed and non-employed women in the sample who have faced at least one episode of abuse by type of intimate partner violence.

Source: Own elaboration.

Table 1 shows the percentage of women who have struggled with at least one episode of abuse. As it can be observed, a higher percentage of employed women have experienced abuse compared to

[7] University degrees are obtained around 22 years old, and employees are entitled to start receiving pension benefits at age 60.

non-employed women in all three categories, highlighting the male backlash model. Emotional violence is the most common abusive behaviour, with 29.7% of employed women and 25.2% of non-employed women facing emotional abuse at least one time.

As additional explanatory variables, the number of years of education, the woman's age, and the area where the woman lives -taking the value of 1 if she lives in an urban area or 0 if she lives in a rural area- are included in the analysis. Other indicator variables also considered are ethnic group and if she has had at least one child.

On average, employed women accumulate more years of education than do non-employed women and are slightly younger in the sample. 89% of employed women and 74% of non-employed women live in urban areas whereas 4% of employed women and 7% of non-employed women belong to an ethnic group. In terms of children, 93% of employed women have at least 1 child compared to 96% of non-employed women.

Table 2
Summary statistics - Additional variables

Variable	*Employed women*		*Non-employed women*	
	Mean	*Standard deviation*	*Mean*	*Standard deviation*
Years of schooling	11	4.6	8.2	4.2
Age	39.7	9	40.6	10.4
Urban area	0.8	0.3	0.7	0.4
Ethnic group	0	0.2	0.07	0.2
At least 1 child	0.9	0.2	0.9	0.1
Total	33 286		56 110	

Notes: The table shows the mean and standard deviation for the additional explanatory variables included in the model.

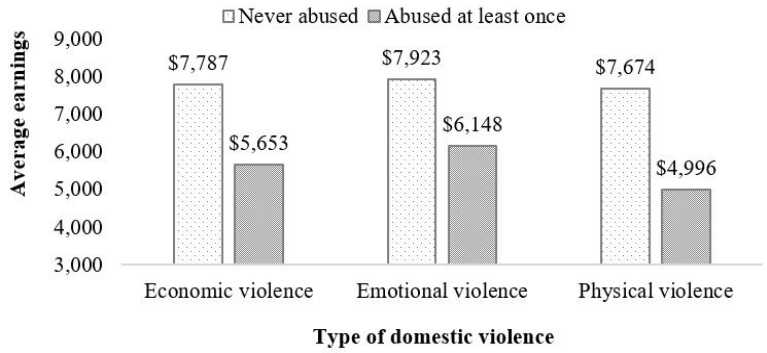
Source: Own elaboration.

Considering only employed women, the average earnings for married women in the sample are 7 396 Mexican pesos.[8] Figure 1 shows how average earnings differ between employed women who have never

[8] Real wages. Base year 2016.

been abused and those who have been abused at least once. As expected, never abused women show higher average earnings than women exposed to abuse. Physical violence presents the largest difference. Average earnings for employed women who have never experienced physical violence are 7 674 Mexican pesos[9] and a substantial drop is observed for the group of employed women who have been exposed to physical violence at least one time with average earnings of 4 996 Mexican pesos.[10]

Figure 1
Average earnings by type of domestic abuse



Source: Own elaboration.

4. Estimation strategy

The human capital earnings function can be considered one of the most popular benchmark models in applied econometrics to study the relationship between earnings and education, and it also has been widely used to analyse the influence of other factors on earnings. To examine the association between domestic violence and women's earnings, the following semi-logarithmic variation of the Mincer equation (Mincer, 1974) is considered:

$$LnW_i = \beta_{Ed}Ed_i + \beta_{Ag}Ag_i + \beta_{Ag^2}Ag^2{}_i + \beta_{Ar}Ar_i + \beta_{Et}Et_i + \beta_{Ch}Ch_i + \beta_{Dv}Dv_i + \varepsilon_i \quad (1)$$

[9] Ibid.
[10] Ibid.

 https://doi.org/10.24201/ee.v38i1.438

where the subscript i refers to women and $i = 1, ..., n$; LnW_i is the natural logarithm of earnings,[11] Ed_i is the number of years of schooling and Ag_i and ${Ag_i}^2$ represent the woman's age and its square. In addition, three binary variables denoting if the woman i lives in an urban area $Ar_i = 1$, belongs to an ethnic group $Et_i = 1$ and has had at least one child $Ch_i = 1$, are included. Finally, Dv_i is the intimate partner violence variable. Three different specifications of (1) are estimated using ordinary least squares according to each type of IPV: economic, emotional and physical; and within each specification, estimations are performed using the three alternative measures of intimate partner violence discussed previously in section 3.1, an index variable, a binary variable and an indicator variable with three categories.

5. Results

5.1 *Main results*

The results obtained using the IPV index proposed in this paper as an alternative to the traditional dichotomous measure of domestic abuse are presented in table 3. Column (1) indicates the coefficients obtained when using the economic violence index, column (2) when using the emotional violence index, and column (3) when the physical violence index is used.

All types of IPV have a negative and statistically significant effect on women's earnings. Emotional violence is the abuse with the highest impact, followed by physical and economic abuse. A one standard deviation increase in the emotional abuse index decreases women's earnings on average by 1.5%. A one standard deviation increase in the physical violence index and the economic violence index also reduces earnings on average by 1% and 0.9%, respectively.

A possible explanation for emotional violence having the largest negative association with earnings is that women emotionally abused at home might also be more likely to experience emotional violence from bosses or co-workers, as it is less likely to be physically or economically abused at work; perceiving as a consequence even lower wages. On the contrary, economic abuse shows the smallest negative effect on earnings. It is likely that women facing economic abuse

[11] As mentioned earlier, earnings equal to zero have been imputed to non-employed women. However, as the natural logarithm is not defined for zero, the popular fix of adding the value of 1 to earnings has been followed.

have less incentives to get better jobs or pursue higher salaries as their husbands are controlling all their money anyway, and they have no autonomy to dispose of their own salaries.

Focusing now on the additional covariates included in the model, education shows as expected a significant positive effect on earnings. An additional year of schooling is associated on average with a 4.7% increase on earnings. On the other hand, having at least 1 child presents a negative effect on earnings. As opposed to childless women, employment decisions of married women with children are influenced by factors such as the husband's financial support[12] and childcare, with a more tangible effect on earnings.

Table 3
Regression estimates - IPV index variable

Dependent variable is ln(earnings)	*(1)*	*(2)*	*(3)*
Economic violence index	-0.009***		
	(0.0034)		
Emotional violence index		-0.015***	
		(0.0035)	
Physical violence index			-0.010***
			(0.0037)
Years of schooling	0.048***	0.047***	0.047***
	(0.0008)	(0.0008)	(0.0008)
Age	0.017***	0.017***	0.017***
	(0.0023)	(0.0023)	(0.0023)
Age squared	-0.0001***	-0.0001***	-0.0001***
	(0.00002)	(0.00002)	(0.00002)
Urban area	0.051***	0.052***	0.051***
	(0.0082)	(0.0082)	(0.0082)
Ethnic group	-0.016	-0.017	-0.015
	(0.0128)	(0.0128)	(0.0128)
At least 1 child	-0.174***	-0.173***	-0.174***
	(0.0162)	(0.0162)	(0.0162)

[12] Typically, the main breadwinner in the household in developing countries.

Table 3
(Continued)

Dependent variable is ln(earnings)	*(1)*	*(2)*	*(3)*
R-squared	0.9453	0.9454	0.9454
Total	89 396	89 396	89 396

Notes: The table shows the coefficients obtained for each explanatory variable included in the model when intimate partner violence is measured using the economic violence index (column 1), the emotional violence index (column 2) and the physical emotional index (column 3). Robust standard errors in parentheses. All regressions include a constant term and employment and survey year control dummies. ***Statistically significant at the 99% confidence level.

Source: Own elaboration.

5.2 *Additional measures of intimate partner violence*

As mentioned before, studies on intimate partner violence use a straightforward measure of abuse. Women who have experienced domestic violence only one time and women who have struggled with abuse more than once are grouped together and compared to the group of women never exposed to IPV. Although the coefficients obtained from this approach are not directly comparable with those in section 5.1, it is interesting to report them in table 4.

Similar to the results in table 3, all the IPV different categories exhibit a negative and statistically significant effect on earnings. Emotional violence continues to have the largest negative effect on earnings, followed by physical and economic violence. Column (1) indicates that women who have experienced economic abuse earn, on average, 2.3% less than women never economically abused by their husbands. Also, lower earnings are observed in column (2) and column (3) for married women exposed to emotional and physical violence, with a reduction in earnings on average by 4% and 3.6%, respectively.

Another alternative to estimate the association between IPV and women's earnings is to create an indicator variable. Following this approach, women never abused, women abused only one time and women abused more than once are classified in three different groups. The results obtained are presented in table 5.

 https://doi.org/10.24201/ee.v38i1.438

Table 4
Regression estimates - IPV binary variable

Dependent variable is ln(earnings)	*(1)*	*(2)*	*(3)*
Economic violence	-0.0231***		
	(0.00883)		
Emotional violence		-0.0409***	
		(0.0076)	
Physical violence			-0.0364***
			(0.0113)
Years of schooling	0.048***	0.047***	0.047***
	(0.0008)	(0.0008)	(0.0008)
Age	0.017***	0.017***	0.017***
	(0.0023)	(0.0023)	(0.0023)
Age squared	-0.0001***	-0.0001***	-0.0001***
	(0.00002)	(0.00002)	(0.00002)
Urban area	0.051***	0.052***	0.051***
	(0.0082)	(0.0083)	(0.0082)
Ethnic group	-0.016	-0.017	-0.015
	(0.0128)	(0.0128)	(0.0128)
At least 1 child	-0.174***	-0.172***	-0.174***
	(0.0162)	(0.0162)	(0.0162)
R-squared	0.9453	0.9454	0.9454
Total	89 396	89 396	89 396

Notes: The table shows the coefficients obtained for each explanatory variable included in the model when intimate partner violence is measured using a binary variable for economic violence (column 1), a binary variable for emotional violence (column 2) and a binary variable for physical violence (column 3). Robust standard errors in parentheses. All regressions include a constant term and employment and survey year control dummies. ***Statistically significant at the 99% confidence level.

Source: Own elaboration.

 https://doi.org/10.24201/ee.v38i1.438

Table 5
Regression estimates - IPV indicator variable

Dependent variable is ln(earnings)	*(1)*	*(2)*	*(3)*
Economic abuse (omitted group: never abused)			
One-time abused	-0.022		
	(0.0188)		
More than once abused	-0.023**		
	(0.0095)		
Emotional abuse (omitted group: never abused)			
One-time abused		-0.028*	
		(0.0159)	
More than once abused		-0.044***	
		(0.0082)	
Physical abuse (omitted group: never abused)			
One-time abused			-0.004
			(0.0184)
More than once abused			-0.052***
			(0.0138)
Years of schooling	0.048***	0.047***	0.047***
	(0.0008)	(0.0008)	(0.0008)
Age	0.017***	0.017***	0.017***
	(0.0023)	(0.0023)	(0.0023)
Age squared	-0.0001***	-0.0001***	-0.0001***
	(0.00002)	(0.00002)	(0.00002)
Urban area	0.051***	0.052***	0.051***
	(0.0082)	(0.0083)	(0.0082)
Ethnic group	-0.016	-0.017	-0.016
	(0.0128)	(0.0128)	(0.0128)

Table 5
(Continued)

Dependent variable is ln(earnings)	*(1)*	*(2)*	*(3)*
At least 1 child	-0.174***	-0.172***	-0.174***
	(0.0162)	(0.0162)	(0.0162)
R-squared	0.9453	0.9454	0.9454
Total	89 396	89 396	89 396

Notes: The table shows the coefficients obtained for each explanatory variable included in the model when intimate partner violence is measured using an indicator variable with three categories for economic abuse (column 1), an indicator variable with three categories for emotional abuse (column 2) and an indicator variable with three categories for physical abuse (column 3). Robust standard errors in parentheses. All regressions include a constant term and employment and survey year control dummies. ***Statistically significant at the 99% confidence level. **Statistically significant at the 95% confidence level. *Statistically significant at the 90% confidence level.

Source: Own elaboration.

As it can be observed, when using an indicator variable with three levels, physical abuse shows at first glance the strongest negative effect. Women physically abused more than once earn, on average, 5.2% less than women who have never experienced physical violence. However, the relevant role previously found played by emotional violence in table 3 and table 4 becomes evident in here as well, as not only women struggling with emotional abuse more than once but even women who have been emotionally abused only once earn on average less than women who have never faced this type of abuse. The difference in earnings between never abused and one-time-abused women for economic and physical violence are not statistically significant at standard confidence levels. Again, the reader is asked to bear in mind that the results in table 5 are not straightforwardly comparable to those in tables 3 and 4. In the next section, I present how to reconcile the results obtained from these three different approaches.

5.3 *Reconciling the results obtained*

Table 6 presents an exercise allowing a feasible comparison between the results obtained following the three different IPV measures explored in this paper. Using the coefficients obtained in table 3, 4

and 5, equation (1) is evaluated under three scenarios. Column (1) shows the estimated earnings for a hypothetical woman experiencing the highest level of each type of domestic abuse according to the IPV index created. Column (2) reports the earnings for the same hypothetical case but when IPV is measured using the indicator variable. Finally, in column (3) earnings are estimated when using the IPV binary variable. For a woman facing the highest level of abuse that can be captured following these three approaches, earnings are clearly lower in all cases when the IPV index is used.

Table 6
Women's earnings - Highest level of IPV

Type of intimate partner violence	*Index variable = maximum value**	*Indicator variable = 2*	*Binary variable =1*
Economic violence	3 497	3 594	3 681
Emotional violence	3 267	3 448	3 618
Physical violence	3 169	3 356	3 600

Notes: The table shows the average earnings predicted considering a hypothetical woman with average years of education (9.2) and age (40.3), living in an urban area, not belonging to an ethnic group, with children, employed and interviewed in 2016. *Maximum levels of domestic violence: Economic 7.5, Emotional 8.6 and Physical 15.8. Earnings are expressed in real wages. Base year 2016.

Source: Own elaboration.

The implications of these findings are meaningful. For instance, for a woman facing the highest level of emotional violence, the model estimates average earnings of 3 267 Mexican pesos when using the index variable; 3 448 Mexican pesos when using the indicator variable, and 3 618 Mexican pesos when using the binary variable. These results reveal that the negative effect of domestic violence on women's earnings has been traditionally underestimated and highlight the importance of developing more precise measures of intimate partner violence.

6. Conclusion

The negative association between intimate partner violence and women's earnings in Mexico is undeniable, regardless of the IPV measure

used. In addition to suffering the physical and mental consequences of the abuse at home, women facing domestic violence struggle with lower productivity levels in their workplaces, leading to lower earnings. This study provides the first empirical evidence of the negative association between intimate partner violence and women's earnings in Mexico. Furthermore, an index for domestic violence is created to capture the variation observed, challenging the traditional use of a binary variable within this context. This new approach allows to incorporate additional useful information into the analysis, readily available, but typically ignored in studies. It is not expected to be perfect, but it is an interesting initial effort to introduce and highlight how relevant it is to consider the frequency of domestic abuse. Hopefully, it will challenge the traditional use of a dichotomous variable in the literature on IPV and will also stimulate researchers to develop more precise measures of intimate partner violence.

Evidence highlights that women exposed to higher levels of IPV, economic, emotional, or physical, struggle with lower salaries. Emotional violence is the type of abuse with the largest negative effect on earnings, followed by physical and economic abuse. The estimated effects show higher harmful impacts on women's earnings when the IPV index variable proposed in this study is implemented, compared to the effects obtained when the traditional binary measure of IPV is adopted, or when an indicator variable with three levels of abuse is considered.

Mexico has low female labour market participation and high gender-based violence rates. This study aims to draw attention to the importance of these topics and to stimulate more research and public policies in the country to improve the position of women and acknowledge the importance of family dynamics. Only a better understanding of the deep-rooted problems in Mexican society can help us overcome the social and economic challenges we face while trying to shape a better Mexico.

Acknowledgements

I gratefully acknowledge Karen Mumford, Thomas Cornelissen, Emma Tominey, Roberto Cavazos and participants at the 2019 Society of Economics of the Household Annual Meeting and the International Association for Applied Econometrics 2019 Conference, for helpful comments; as well as the financial support provided by the Mexican Council of Science and Technology (CONACYT). I especially thank two anonymous referees and to Editor Stephen McKnight for precise comments and suggestions.

Edith Aguirre: edith.aguirre@essex.ac.uk

References

Access Economics. 2004. *The Cost of Domestic Violence to the Australian Economy: Part 1*, Australia, Partnerships Against Domestic Violence.

Aguirre, E. 2019. Do changes in divorce legislation have an impact on divorce rates? The case of unilateral divorce in Mexico, *Latin American Economic Review*, 28(1): 1-24.

Aguirre, E. 2022. The (non) impact of education on marital dissolution, *Review of Economic Analysis*, 14(4): 503-523.

Anderson, D.K., D.G. Saunders, M. Yoshihama, D.I. Bybeem, and C.M. Sullivan. 2003. Long-term trends in depression among women separated from abusive partners, *Violence Against Women*, 9(7): 807-838.

Bobonis, G.J., M. Gonzalez-Brenes, and R. Castro. 2013. Public transfers and domestic violence: The roles of private information and spousal control, *American Economic Journal: Economic Policy*, 5(1): 179-205.

Bonomi, A.E., M.L. Anderson, R.J. Reid, F.P. Rivara, D. Carrell, and R.S. Thompson. 2009. Medical and psychological diagnoses in women with a history of intimate partner violence, *Archives of Internal Medicine*, 169(18): 1692-1697.

Duvvury, N., M. Nguyen, and P. Carney. 2012. *Estimating the Cost of Domestic Violence Against Women in Vietnam*, Vietnam, UN Women.

Echarri, C.J. 2017. *La Violencia Feminicida en México, Aproximaciones y Tendencias 1985-2016*, Mexico City, Secretaría de Gobernación, ONU Mujeres, and Inmujeres.

Erten, B. and P. Keskin. 2018. For better or for worse? Education and the prevalence of domestic violence in Turkey, *American Economic Journal: Applied Economics*, 10(1): 64-105.

Guarnieri, E. and H. Rainer. 2018. Female empowerment and male backlash, CESifo Working Paper No. 7009.

INEGI. 2006. Encuesta nacional sobre la dinámica de las relaciones en los hogares (ENDIREH) 2006, https://www.inegi.org.mx/programas/endireh/2006/.

INEGI. 2011. Encuesta nacional sobre la dinámica de las relaciones en los hogares (ENDIREH) 2011, https://www.inegi.org.mx/programas/endireh/2011/.

INEGI. 2016. Encuesta nacional sobre la dinámica de las relaciones en los hogares (ENDIREH) 2016, https://www.inegi.org.mx/programas/endireh/2016/.

Martin, S.L., K.E. Moracco, J.C. Chang, C.L. Council, and L.S. Dulli. 2008. Substance abuse issues among women in domestic violence programs, *Violence Against Women*, 14(9): 985-997.

Mincer, J. 1974. *Schooling, Experience and Earnings*, New York, National Bureau of Economic Research.

Morrison, A.R. and M.B. Orlando. 1999. Social and economic costs of domestic violence: Chile and Nicaragua, in A. Morrison and M.L. Biehl (eds.), *Too Close to Home. Domestic Violence in the Americas*, New York, Inter-American Development Bank.

OECD. 2014. *Social Institutions and Gender Index 2014 Synthesis Report*, Paris, OECD Development Centre.

OECD. 2017. *Building an Inclusive Mexico: Policies and Good Governance for Gender Equality*, Paris, OECD Publishing.

Sabia, J.J., A.K. Dills, and J. DeSimone. 2013. Sexual violence against women and labor market outcomes, *American Economic Review: Papers and Proceedings*, 103(3): 274-278.

Sanchez, F. and R. Ribero. 2004. Determinantes, efectos y costos de la violencia intrafamiliar en Colombia, Documentos CEDE No. 1148, Centro de Estudios sobre Desarrollo Económico.

SEGOB. 2015. Nota aclaratoria a la resolución del H. Consejo de Representantes de la Comisión Nacional de los Salarios Mínimos que fija los salarios mínimos generales y profesionales vigentes a partir del 1 de enero de 2016, Diario Oficial de la Federación, https://dof.gob.mx/nota_detalle.php?codigo=5420747&fecha=18/12/2015#gsc.tab=0.

UNGA. 1993. Declaration on the elimination of violence against women, https://www.un.org/en/genocideprevention/documents/atrocity-crimes/Doc.21_declaration%20elimination%20vaw.pdf.

United Nations. 2015. *The World's Women 2015: Trends and Statistics*, New York, United Nations Department of Economic and Social Affairs.

UNODC. 2013. *Global Study on Homicide 2013*, Vienna, United Nations Publication.

Vyas, S. 2013. Estimating the association between women's earnings and partner violence: Evidence from the 2008-2009 Tanzania national panel survey, Women's Voice, Agency, and Participation Research Series No.2, World Bank Group.

Walby, S. 2004. *The Cost of Domestic Violence*, London, Women and Equality Unit.

WEF. 2017. *The Global Gender Gap Report 2017*, Geneva, World Economic Forum.

WHO and CDC. 2008. *Manual for Estimating the Economic Costs of Injuries due to Interpersonal and Self-Directed Violence*, Geneva, World Health Organization and Centers for Disease Control and Prevention.

Appendix

Table A.1
Current relationship - During the last year, how often has your husband...

Economic violence
1. forbidden you to work or study?
2. appropriated possessions from you?
3. spent money needed for household expenditures?
4. not provided money needed for household expenditures or threatened you he will not provide it?

 https://doi.org/10.24201/ee.v38i1.438

Table A.1
(Continued)

Economic violence
5. having money, refused to provide enough for the household expenditures?
6. complained about the way you spend the money?
Emotional violence
7. embarrassed, offended, belittled or humiliated you?
8. ignored or not given you affection?
9. accused you of having affairs?
10. made you feel fear?
11. threatened about leaving/abandoning you, hurt you, take away the children or get you thrown out of the house?
12. locked you in, forbidden you from going out or being visited?
13. spied, followed you when leaving home or suddenly appears in places that you are at?
14. threatened you with a weapon or that he will burn you?
15. threatened to kill you, himself or the children?
16. destroyed, thrown away or hidden things belonging to you or the household?
17. stopped talking to you?
18. manipulated your children or relatives against you?
19. been very angry because the housework is not done, the food is not prepared the way he likes it or he believes you are not fulfilling your duties?
Physical violence
20. pushed you or pulled your hair?
21. tied you up?
22. kicked you?
23. thrown any object to you?
24. hit you with his fist or any object?
25. tried to choke you?
26. assaulted you with a knife or blade?
27. shot you with a firearm?

 https://doi.org/10.24201/ee.v38i1.438

Table A.1
(Continued)

Physical violence
28. demanded you to have sex, even if you do not want?
29. forced you to do things you do not want when having sex?
30. physically forced you to have sex?

Source: Own elaboration based in ENDIREH 2006 and 2016.