On the relationship between violent conflict and wages in Colombia[*]

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Abstract

We analyze how forced displacements caused by violent conflict are related to the wages of workers in Colombia. Using data from the Quality of Life Survey (2011-2014), we analyze the differences in wages between those forced by violence to move to other regions, and those who moved for other reasons We apply Propensity Score Matching techniques to compare workers from the two groups, finding that forced displacement is related to decreases of between 10% and 29% in the wages of males, and between 18% and 37% in the wages of females, relative to their counterparts. Thus, forced displacements are related to poorer labor market outcomes in terms of wages.

Keywords: Forced displacement, wages, Propensity Score Matching

JEL Codes: J15, J31, R23.

1. INTRODUCTION

In this paper, we analyze how the forced displacement of individuals due to violence is related to the wages of workers in Colombia. This phenomenon, displacement due to violent conflict, is emerging as an important developmental challenge, as extreme poverty is now increasingly concentrated in those who flee from conflict and violence (The World Bank, 2017). Although it may seem that the refugee crisis in MENA countries, especially in Syria, has pushed the interest in this topic, research on this topic has been present for several decades (Baez, 2011; Bakewell, 2000; Bauer, Braun & Kvasnicka, 2013; Black, 1994; Card, 1990; Calderón-Mejía & Ibáñez, 2016; Chambers, 1986). Currently, about 65 million people live in forced displacement, which represents 1% of the world population (UNHCR, 2015). Thus, an analysis of the economic consequences of forced displacement is crucial, since the results of such studies may determine and support public policies aimed at alleviating the poverty risk faced by this category of individuals.

Colombia is an interesting case for the analysis of forced displacements, given its historical and large flows of forcibly-displaced individuals. In the period between 1985 and 2013, large displacements occurred in Colombia, as is shown in Figure 1. According to UARIV ("Unidad para la Atención y Reparación Integral a las Victimas"), in the year 2002 more than 600,000 were forced to migrate in Colombia, and despite that displacement flows have decreased over time, this phenomenon is still affecting the lives of thousands of individuals as forced displacement has held relatively constant in recent years at around 200,000 per year. These flows put Colombia in the first rank of countries affected by forced displacements. For instance, in the year 2013, Colombia ranks second in the number of displaced individuals (5.7 million), exceeded only by Syria (6.5 million), and surpassing other countries such as Nigeria, Iraq, Afghanistan, India, and Yemen (See Figure 2).

Obviously, when individuals are forcibly displaced to a different region of residence, their economic outcomes will be affected. One of the most important of these outcomes is wages, consistent with prior evidence from Blattman and Miguel (2010), who find that wars and civil conflicts produce displacements of the population, which in turn produces shocks in labor markets. If individuals are forcibly displaced, they may have problems in accessing new employment, given that their social networks are reduced (Castilla, 2005; Mouw, 2003; Sanders & Nee, 1996), or their wages may be lower, reflecting a mismatch between their specific skills and the jobs available in the region (Bonikowska & Morissette, 2012; Couch &

Placzek, 2010; Eliason and Storrie, 2006; Hijzen, Upward & Wright, 2010; Jacobson, LaLonde & Sullivan, 1993; Seim, 2012). Thus, to the extent that displaced workers may have poorer economic outcomes, we may see violent conflicts and their associated displacement flows as a source of inequality. Thus, the analysis of how forced displacements affect the wages of displaced workers is important for policy issues.

But in contrast with other countries, forced migration in Colombia is largely internal. As noted by Ibañez (2009), the phenomenon involves all of Colombia's territory and nearly 90 percent of the country's municipalities either expel or receive populations. In Colombia, illegal armed groups are the primary responsible parties. These migrations do not result in massive refugee streams, but rather occur on an individual basis, and the displaced population is dispersed throughout the territory and is not focused on refugee camps. These characteristics pose unique challenges for crafting state policy that can effectively mitigate the impact of forced displacement, and an analysis of the economic consequences of this phenomenon may help to guide public policies aimed at minimizing the negative consequences of forced displacement (Blattman & Miguel, 2010).

Using the data from the Quality of Life Survey (QLS) in Colombia for the years 2011 to 2014, we compare the wages of those who were forced to abandon their place of residence because of violence, with those who moved for other reasons. We consider this forced displacement as a "quasi-policy", given that individuals who were displaced could not choose the level of violence in their regions of origin, and we further consider this displacement to be a "quasi-exogenous" treatment of individuals in their regions of origin. Under these assumptions, we apply Propensity Score Matching (PSM) techniques, and find that forced displacement is related to decreases of between 10% and 29% of the wages of males, and between 18% and 37% of the wages of females, compared to their counterparts. These results are consistent with existing evidence showing that forced displacement has negative outcomes for individuals in Colombia (Ibáñez & Moya, 2006, 2007, 2010; Ibáñez & Velásquez, 2008; Ibáñez & Velez, 2008).

Our contribution to the literature is twofold. First, we contribute to the analysis of the negative economic consequences of armed conflicts (Blattman & Miguel, 2010; Deininger, 2003; Kondylis, 2008, 2010; Merteens & Stoller, 2001), focusing on the wages of displaced workers. Abadie and Gardeazabal (2003) focus their analysis on the macroeconomic

consequences of the Basque conflict in Spain, and find that, after the outbreak of terrorism in the late 1960's, per capita GDP in the Basque Country declined by about 10 percentage points, while firms showed a positive relative performance when the truce became credible, and a negative relative performance at the end of the cease-fire. Angrist and Kugler (2008) analyze the economic and social consequences of a major shift in the production of coca paste from Peru and Bolivia to Colombia, and find that this shift generated economic gains in rural areas, primarily in the form of increased self-employment earnings and increased labor supply of teenage boys, while the rural areas that saw accelerated coca production subsequently became much more violent. Engel and Ibáñez (2007) develop a conceptual framework for the empirical analysis of displacement decisions, and apply the framework to the case of Colombia.

Second, we contribute to the analysis of wage inequality in Colombia (Attanasio, Goldberg & Pavcnik, 2004; Bell, 1997; Birchenall, 2001; Bourguignon, Nuñez & Sanchez, 2007; Fields, 1979; Fields & Schultz, 1980; Mohan & Sabot, 1988), which is an important issue, given that a large proportion (30.6%) of the population live in poverty (DANE, 2014), and Colombia is the third most unequal country in Latin America and tenth in the world (The World Factbook, 2014). While inequality has been considered the primary reason for the conflict, the consequences of the conflict must be analyzed. If violence fosters inequality, public policies focused on displaced workers may serve as one step toward the progressive eradication of violence in the country.

The rest of the paper is organized as follows. Section 2 describes the background, for a better understanding of conflict in the country. Section 3 describes the data. Section 4 describes our empirical strategy, Section 5 presents the results, and Section 6 sets out our main conclusions.

2. BACKGROUND

According to the Internal Displacement Monitoring Centre (IDCM), a main source of information and analysis of internal displacements, as of January 2015 there are 33 million displaced individuals on the planet, who were forced to abandon their homes due to armed conflict, situations of generalized violence, or violations of human rights. The number of displaced individuals around the world increased in the period 1997-2015, indicating that this

phenomenon is far from disappearing, and has become an issue of global concern. In the case of Colombia, forced displacements remain as one of the main challenges to the country. However, the negotiations that have been carried out, in Cuba, since 2012, between the FARC (Fuerzas Armadas Revolucionarias de Colombia) and the Central Government, appear to be yielding a crumb of hope for the end of the conflict.

The phenomenon is not new in Colombia. At the end of the 19th century and the beginning of the 20th century there was a large flow of displaced people due to the "war of the thousand days" between the Liberal Party and the Government of the National Party. Later, in the period 1949-1960, the "era of violence" involved a confrontation between the supporters of the Liberal Party and the Conservative Party, leading to the displacement of those supporting the Liberal Party. Finally, from 1980 to date, we find the phenomenon of violent conflict among many elements - the Government, guerrilla bands, various militias, delinquency, drug trafficking, and various other criminal entities. It is in this latest period that we begin to have data and statistics on the individual consequences of violent conflict, and where we can find several sources of information: the Unit for the Assistance and Comprehensive Recovery of Victims (Unidad para la Atención y Reparación Integral a las Victimas, UARIV), the Observatory for Human Rights and Displacements (Consultoría para los Derechos Humanos y el Desplazamiento, CODHES), and the International Committee of the Red Cross (Comate Internacional de la Cruz Roja, CICR).

Despite that most studies of this topic concentrate on the conditions that lead civilians to flee their communities, rather than the consequences of such decisions (Ibáñez & Vélez, 2008), some studies have analyzed the consequences of violence in Colombia. For instance, Garay and Barberi (2009) analyzes the situation of the displaced in Colombia, showing a high level of inequality and insecurity, where some basic rights such as identity, health, education, housing, and income generation are infringed. Ibáñez and Moya (2006) study the victims of forced displacement arriving in the cities from rural areas, with large numbers who used to work in the agricultural sector encountering difficulty in access to and integration in the urban labor market. The authors find that unemployment rates soar during the first months of settlement: unemployment rates for household heads increase from 1.2% in their places of origin to more than 50% during the first three months after displacement. Although these rates decline to 14% after one year of settlement, displaced households fare worse than the urban poor. Furthermore, these problems are concentrated among individuals with low levels of

education. In this situation, children drop out of school to participate in the labor market, in order to generate additional income for the family. Calderón-Mejía and Ibañez (2016) use the exogenous nature of forced migrations in Colombia to understand how migrations from directly affected areas influence labour markets not directly touched by conflict, finding that these migrations substantially reduce wages for urban unskilled workers who compete for jobs with forced migrants.

Focusing on the consequences of forced migration on earnings/wages/income, a small number of papers have recently analyzed this topic for Colombia. Ibáñez and Moya (2007) find evidence that displaced individuals suffer a significant decline in consumption and earnings, and Ibáñez and Moya (2010) find that victims of civil conflict face difficulties in generating income, as labor income per equivalent adult declines by 50%. Ibáñez and Velásquez (2008) analyze the impact on economic conditions of displaced workers in Colombia, finding that labor income falls sharply after the displacement. However, none of these prior studies have directly analyzed the wages of individual workers.

3. DATA AND VARIABLES

For the analysis of the relationship between forced displacement and wages, we use data from the Quality of Life Survey in Colombia (QLS) for the years 2011 to 2014, which represents one of the main sources of socio-economic data in the country. The survey began in 1993 and is focused on household-level data collection regarding health, education, childcare, labor force status, income and expenditures, the labor structure, access to public services, housing characteristics, and household expenses, among other factors. The QLS is taken annually and covers the entire country, with a cross-sectional structure. We focus on the years 2011 to 2014, since data on the reasons why individuals move to other places are available only for these years.

For our sample, we select heads of household between the ages of 18 and 60 years of age (inclusive) who participate in the labor market, and of whom we have information on wages. (The age limits constitute the minimum and maximum for participation in the labor market.) The data for the years 2011 to 2014 include a question (P5739) that allows us to identify individuals who have been displaced by violence, which reads as follows: "What was the main reason you changed your residence to the current one?". This question includes several

possible responses, and number four is "Threat of risk to your life, your freedom, or your physical integrity, generated by violence". We consider the group of displaced workers by violence to those who selected this response. In order to identify the relationship between forced displacement and wages, we need to choose a control group to be able to compare wages. Within this framework, we choose those who moved from their original region of residence for other reasons. That is, for the question "What was the main reason you changed your residence to the current one?" they chose one of the following answers: 1) Difficulties to find a job or no resources to make living; 5) Educational needs; 6) Because the respondent got married or formed a couple; 7) Health-related motives; 8) Improve housing or location; 9) Better labor market opportunities or business opportunities; 10) Other reasons. We have excluded from the analysis the options2) Risk of natural disaster (flood, avalanche…); and 3) Natural disaster (flood, avalanche…), since they can be considered as another form of forced involuntary migration, and we want to compare forced vs. unforced migration. Our final sample comprises 15,385 observations, with 11,554 males and 3,831 females, including1, 244 males and 572 females who were displaced by violence.[1]

Our variable of interest measures individual wages, measured in local currency (Colombian pesos), in thousands per month. This information is obtained directly from the survey. Table 1 shows the average wage of selected workers, by displaced/non-displaced status and gender.[2] First, we observe that wages of women are lower than wages of men, for workers displaced by violence (556.82 vs. 336.66) and displaced for other reasons (888.92 vs. 717.10), with these differences being statistically significant at standard levels. Furthermore, and comparing workers displaced by violence and displaced for other reasons, we observe that, for both men and women, workers displaced by violence have a comparatively lower wage, with the differences being statistically significant at the 99% level. In particular, for men, we observe that while male workers displaced by violence have an average wage of 552.86, male workers displaced for other reasons have an average wage of 888.92, a difference of 37.7% of the wage of male workers displaced by violence. For women, the difference between the two groups represents 28.4% of the wage of female workers displaced by violence. The differences in wages between the two groups points to a negative relationship between forced displacements and wages.

Thus, we observe that there are substantial differences in wages among displaced workers, depending on whether they were moved by violence or for other reasons, although these are

raw differences and do not take into account other socio-demographic characteristics. For instance, it could be that workers who were moved by violence come from poorer regions, where levels of education are comparatively lower, which could explain part of the observed difference. Thus, in what follows, we attempt to net out the relationship between forced displacement and wages from differences in socio-demographic characteristics. Other variables that may have some relationship to wages, and that are included in our analysis, are age, education, civic status, physical place of work, ownership of dwelling, type of dwelling, status of electricity rate, whether the dwelling has running water, and the region of residence.[3] Table A1 in the Appendix shows average values of all these variables.

Age is measured in 10-yearage groups. In the case of men, there are no significant differences in the ages of those displaced by violence and those who moved for other reasons. However, in the case of women, we observe that those who moved for other reasons are comparatively younger, as there is a higher proportion of those who moved for other reasons in the age group of 18-29, with a lower proportion of them in the age group of 51-60. To the extent that age is an important determinant of fertility, as the mean age of women at childbirth in Colombia is around 21 years (Profamilia, 2014), if individuals are displaced from more violent to less violent regions, those more violent regions will experience a reduction in fertility, which may foster inequality and problems of violence. Regarding education, we define levels of education as, 1) no education (illiteracy), 2) Primary education, 3) Secondary education, 4) Vocational training, and 5) University education. We observe that for both men and women, those who moved for other reasons, in comparison to workers displaced by violence, have a higher level of education as there is a higher proportion of workers with secondary education, vocational training, and university education. These differences in education may be one of the sources of the reported wage gap between displaced by violence and those who moved for other reasons. It may also indicate that displaced workers come originally from poorer areas with lower levels of development, and thus the level of education of those workers is lower. These results are consistent with Ibáñez and Querubín (2004), who find that the enrollment rate in the group of displaced people is very low.

For the civic status of workers, five possible levels are considered: 1) single, 2) living with a partner, 3) widow, widowed, 4) separated or divorced, and 5) married. We observe differences in civic status between those displaced by violence and those who moved for other reasons, as displaced workers present a higher probability of living with a partner, and a lower

probability of being single. When we compare women and men displaced by violence, we observe that the proportion is higher for the case of widows than for widowers; this could be because in most situations, when forced displacement occurs, it is man the one who loses his life.

In the survey, there are two questions that allow us to analyze how workers feel about their degree of security, and their wellbeing. Regarding the degree of perceived security, we use the information from the response to the question "How do you feel in your place of residence?", with two possible responses: 1) secure; 2) insecure. We find differences between those displaced by violence and those who moved for other reasons, as the latter report higher levels of perceived security, for both men and women. Regarding the reported wellbeing of workers, we use the information from the response to the question "In relation to the place you were born, now your life is", with three possible responses: 1) better, 2) the same, and 3) worse. Comparing the two groups, we observe that violently-displaced workers are less satisfied with their current life, as they have comparatively greater probabilities of reporting worse living conditions than those who moved for other reasons.

The variable for the physical place of work refers to whether workers develop their tasks in the company's offices/facilities, the respondent's home, or other places. Here, we must highlight that, while those who moved for other reasons are more likely to work at the firm's facilities, violently-displaced workers are more likely to work as street vendors. This is consistent with Ibáñez and Querubín (2004), who find that there is a higher degree of informality regarding work for the group of displaced people, as we may consider street vendors as highly informal.

One characteristic that may be related to wages is that of housing. The survey provides information on the ownership of the dwelling (e.g., own dwelling fully owned, own dwelling with mortgage, renting, usufruct, and occupied without ownership) and the type of dwelling (house, apartment, or room). We observe differences between those displaced by violence and those who moved for other reasons, as those who moved for other reasons are more likely to live in apartments and be less likely to live in houses, in comparison with those who were displaced by violence. An important question in Colombia is that of the electricity rate. Depending on the economic status of the household, individuals pay different rates for electricity services, with high-income households paying a "high" rate, while others, with

fewer resources, pay a "medium" or "low" rate, since the price of the service is partially subsidized. We observe that displaced workers are more likely to pay "low" rates.

Finally, we consider differences in the region of residence, since the level of violence may differ depending on the specific area. For instance, Angrist and Kugler (2008) find that the variation in the prices of natural resources affects the level of violence in the region. Thus, the number or origin of displaced workers varies depending on the region of residence, and we consider the nine regions described in the survey: Atlántida, Oriental, Central, Pacifica, Bogotá, Antioquia, Valle del Cauca, San Andrés, and Orinoquia-Amazonía.

4. MATCHING WORKERS: THE PROPENSITY SCORE MATCHINGMETHOD

The PSM approach has traditionally been used to evaluate employment and education programs (Dehejia & Wahba, 1999, 2002; Fraker & Maynard 1987; Heckman, Ichimura & Todd, 1998; Jalan & Ravallion, 2003; Lalonde, 1986; Rosembaun & Rubin, 1983), and is especially suitable in cases when an experimental design is infeasible, which allows the matching of individuals in one treatment group to others who did not participate, but have comparable characteristics.[4]The PSM method employs a predicted probability of group membership (treatment vs. control group), based on observed predictors usually obtained from a logistic regression to create a counterfactual group. In the current context, we define the control group as those who have moved for other reasons, while our treated group includes all workers displaced by violence. In the PSM method, the main characteristic of the treatment under evaluation is its exogeneity, in the sense that the treatment is not controllable by the individuals. Thus, we make the assumption that the level of violence in the residence of origin is exogenous and not controllable by the individual who moved, and thus, those who moved to escape violence did so when it reached an intolerable level. In this case, we assume that the decision to move because of violence is exogenous, while other reasons to move have an endogenous component.

Once the treated and control groups have been defined, and the score has been calculated based on the observable characteristics of individuals, observations in the two groups are matched and compared, in order to obtain the effect of the treatment on the treated (Average effect of Treatment on the Treated – ATT), which represents an unbiased estimator. In doing so, several steps must be followed. We first specify and estimate a binomial probit model of

the probability of belonging to the displaced sample; and we obtain the Propensity Score (PS). Second, we impose the common support condition; that is, we restrict the sample of those who moved for other reasons to observations whose estimated PS lies within the ranges of estimated PS of the displaced (i.e., the common support condition). Third, we pair each individual from the displaced sample with another individual from the non-displaced sample. Fourth, we compute the ATT.

The PS is defined as the probability of being displaced, conditional on the common observed covariates ($p(Xi)=Pr(i \in$ displaced| $X=x$)). Table 1 shows the results from the probit model of the likelihood of belonging to the sample of workers displaced by violence, for men and women separately. We run a probit regression of the binary indicator, taking value "1" for observations in the displaced sample, and "0" for those who moved for other reasons, over the set of common variables. We consider the demographic and personal characteristics described in the previous Section. In the estimation of the PS, the balancing property is fulfilled (the mean propensity score is the same for treated and untreated individuals in each block).[5] Once the probit model for the probability of being displaced by violence has been estimated, we calculate the PS and impose the common support restriction to obtain the ATT, in that we adjust the group of those who moved for other reasons, whose PS is in the range of the Propensity Score of the group of workers who were displaced by violence.[6]

Once the PS has been calculated for workers in the two groups, we match them based on the PS and calculate the effect of treatment on our variable of interest (log of wages). For matching the observations, we use several methods: nearest neighbor, stratification, radius, and kernel matching (see Caliendo and Kopeinig (2008) for a description of each algorithm). For the nearest neighbor matching, each treated observation is matched with an untreated observation with the closest PS (Becker and Ichino, 2002), although matching faces the risk of bad matches if the closest neighbour is far away. Dehejia and Wahba (2002) suggest radius matching, where not only the nearest neighbour within each caliper (i.e., maximum propensity score distance) is used for the matching, but all of the comparison members within the caliper, reducing the risk of bad matches. Stratification matching partitions the common support of the propensity score into a set of intervals (strata) and calculates the impact within each interval by taking the mean difference in outcomes between treated and control observations (Rosenbaum & Rubin, 1983). Finally, Kernel matching is a non-parametric estimator that

uses the weighted averages of all individuals in the control group to construct the counterfactual outcome.

Panels A and B of Table 3 show the results of estimating the ATT based on the nearest neighbor, stratification, radius (0.001) and kernel matching, for men and women, respectively. Wages have been transformed to log form so that the effects can be interpreted as changes in percentage points. We show the ATT, the standard error of the ATT, and the t-ratio calculated as the ratio between the ATT (in absolute values) and its standard error. T-ratios higher than 1.96 indicate that the effect is statistically significant at the 95% confidence level. We observe that, in all cases, the t-ratios are higher than 1.96, indicating, independently of the algorithm matching used, that we obtain a statistically significant relationship. In the case of men, the ATT calculated using the nearest neighbor, stratification, radius (0.001), and kernel matching are -0.101, -0.174, -0.294 and -0.270, respectively. In the case of women, the corresponding ATT are -0.178, -0.191, -0.371 and -0.270, respectively. Thus, we find that forced displacement caused by violence is related to decreases between 10% and 29% in the wages of males, and between 18% and 37% in the wages of females, compared to those workers who moved for other reasons, which represents a negative relationship between forced displacements caused by violence and the wages of workers in Colombia. Our results are consistent with prior results. For instance, Ibáñez and Moya (2010) find that victims of civil conflict face difficulties in generating income, as labor income per equivalent adult declines by 50%.

5. CONCLUSIONS

In this paper, we analyze how displacements caused by violent conflict are related to the wages of workers in Colombia. Using the data from the Quality of Life Survey (QLS) in Colombia for the years 2011 to 2014, we compare the wages of those who were forced to abandon their place of residence through violence, with those who were not forced to do so and moved for other reasons, finding that displacement caused by violence is related to decreases between 10% and 29% in the wages of males, and between 18% and 37% in the wages of females, compared to those workers who moved for other reasons

Our results are consistent with prior results showing that forced displacements due to violence are related to negative labor market outcomes. Additionally, when combined with

the cases where one member of the couple dies in a violent conflict, the economic conditions lead to lives of isolation and marginalization, which represents a source of income inequality in a country already characterized by a high level of inequality. Public policies focused on mitigating the negative impact of forced displacements, via subsidies or reduction in the prices of public services, may help to alleviate such conditions. Furthermore, the negative effect has a greater impact on women, who are an important factor in the educational and childcare systems. Furthermore, forced displacements contribute negatively to the development of the country, and pose unique challenges for crafting state policy to effectively mitigate the impacts of displacement, and an analysis of the economic consequences of this phenomenon may help to guide public policies of alleviation. These are the reasons why the topic is important, and of growing urgency given displacement dynamics in other contexts. It is very difficult to execute a similar project in countries such as Syria, or regions such as Sub-Saharan Africa or South Asia. Our work may serve as guidance for future research, given the need to keep pushing the frontier of knowledge that can be established in similar cases, such as Colombia.

Our results may also serve to encourage future research on this topic, to find answers to the question of why women in particular are more affected by this negative shock. One extension to the analysis would be to analyze why the subsidies given by the Colombian government are insufficient in solving this problem. Subsidies and psychological support must form a basis for displaced individuals, as they are exiled from their regions of origin, with few, if any, resources, in conditions of fear and anguish. Colombia has a well-developed judicial framework, but the serious challenge is to make it work. Another extension would be an analysis of labor-force participation decisions. Here, we focus on wages, assuming that labor-force participation decisions are exogenous to the treatment. However, it is necessary to analyze the extent to which the displaced have problems finding jobs in their regions of destination.

One of the limitations of our analysis is that the sample of displaced individuals is relatively small, given the difficulties of finding subjects willing to answer the questions used in the survey. As the survey is implemented in the future, the sample size will increase, and more topics related to displacement caused by violence will come to the fore. Furthermore, with the data at hand, we cannot talk about causality, but only about relationships, and more research on this topic is needed.

ENDNOTES

1 If we want to analyze the effect of forced displacements on labor outcomes, the probability of employment and of wages could be analyzed. However, in the decision to participate in the labor market, we may have sample selection issues (Heckman, 1979), which in combination with the PSM technique complicates our analysis. Thus, we focus on wages as those are observed only for those who participate in the labor market. Our focus on heads of household is because only that individual answers the question about forced displacement, and we do not know whether other members of the household were also forced to move, or arrived in the household after the displacement (e.g., new partner, new-born children). We have done the analysis, changing the control group, by considering non-displaced workers. Results are consistent and available upon request.

2 Given prior research showing gender discrimination in wages in Colombia (Angel-Urdinola and Wodon, 2006; Seguino, 2000; Weichselbaumer & Winter-Ebner, 2005), throughout the paper we analyze men and women separately.

3 Those displaced by violence are likely to come from rural and unstable regions with inadequate social services, while those who moved for other reasons are likely to come from more urban regions with better-quality social services. It is likely that the quality of education and health care will be lower in rural and unstable regions, which is likely to affect wages, so the wage difference obtained could simply reflect differences related to where the workers grew up. Furthermore, Ramírez, Zuluaga, and Perilla (2010) show that the Colombian areas subject to the most migration are Valle del Cauca, Bogotá, and Antioquia, while the country's departments with the greatest percentage of emigrants are the departments of Risaralda, Valle del Cauca, Quindío, Putumayo, San Andres, Atlántico, Caldas, and Bogotá. Thus, displaced people are likely to go to other departments. Unfortunately, there is no information on the region of origin of the individuals, and thus the comparison between the two groups cannot be done using both the region of origin and the destination.

4 See Caliendo and Kopeinig (2008) for a review of the PSM technique, and guidance for the implementation of the method. The advantage of the PSM method, compared to other matching methods, is that it develops a single (propensity) score that encapsulates multiple characteristics, rather than requiring a one-to-one match of each characteristic, simplifying matching by reducing dimensionality. Other analyses of the consequences of forced displacements on the income of households, such as Ibáñez and Moya (2010), compare the levels of income before and after the displacement, which allows us to control for the unobserved heterogeneity of households/individuals. However, we do not have information on wages prior to displacement, and thus we rely on an alternative estimation technique.

5 In the literature of the evaluation of public policies/programs, researchers must face the dimensionality problem, which is the lack of common support between treated and untreated groups with cells containing treated observations and/or untreated observations only, and it arises when the number of covariates is large, or many of the covariates have many values, or are continuous. In this framework, the "Balancing Property" establishes that the mean propensity score must not be different for treated and untreated individuals in each cell, and if this property is not fulfilled, a less parsimonious specification of the propensity score is needed. The fulfillment of this property prevents us from introducing all the categorical variables as vectors of dummy variables, and some are included as continuous covariates.

6 Figure 1A in the appendix shows the PS histograms for both datasets, and for men and women, respectively, showing a high degree of overlap between the two distributions, indicating that the common support assumption is satisfied. Regarding the factors that affect the probability of being displaced, we find that greater age, a lower level of education, the ownership of the dwelling (rent is related to a higher probability of being displaced, vs. ownership), whether or not the individuals feel insecure in their place of residence, and higher electricity rates, are all factors related to a greater probability of being a worker displaced by violence.

COMPLIANCE WITH ETHICAL STANDARDS

DATA AVAILABILITY

The datasets generated during and/or analysed during the current study are available from the corresponding author on request.

REFERENCES

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American Economic Review*, *93*, 113-132. doi: 10.1257/000282803321455188

Angel-Urdinola, D. F., & Wodon, Q. (2006). The gender wage gap and poverty in Colombia. *Labour*, *20*, 721-739. doi:10.1111/j.1467-9914.2006.00358.x

Angrist, J. D., & Kugler, A. D. (2008). Rural windfall or a new resource curse? Coca, income, and civil conflict in Colombia. *The Review of Economics and Statistics*, *90*, 191-215. doi: 10.1162/rest.90.2.1.191

Attanasio, O., Goldberg, P. K., & Pavcnik, N. (2004). Trade reforms and wage inequality in Colombia. *Journal of Development Economics*, *74*, 331-366. doi: 10.1016/j.jdeveco.2003.07.001

Baez, J. E. (2011). Civil wars beyond their borders: The human capital and health consequences of hosting refugees. *Journal of Development Economics*, *96*, 391-408. doi: 10.1016/j.jdeveco.2010.08.011

Bakewell, O. (2000). Repatriation and self-settled refugees in Zambia: bringing solutions to the wrong problems. *Journal of Refugee Studies*, *13*, 356-373. doi: 10.1093/jrs/13.4.356

Bauer, T. K., Braun, S., & Kvasnicka, M. (2013). The Economic Integration of Forced Migrants: Evidence for Post-War Germany. *The Economic Journal*, *123*, 998-1024. doi: 10.1111/ecoj.12023

Becker, S. O., and Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. *The Stata Journal*, 2, 358-377. Retrieved from http://www.stata-journal.com/article.html?article=st0026

Bell, L. A. (1997). The impact of minimum wages in Mexico and Colombia. *Journal of labor Economics*, *15*, S102-S135. doi: 10.1086/209878

Birchenall, J. A. (2001). Income distribution, human capital and economic growth in Colombia. *Journal of Development Economics*, *66*, 271-287. Retrieved from https://doi.org/10.1016/S0304-3878(01)00162-6

Black, R. (1994). Refugee migration and local economic development in Eastern Zambia. *Journal of Economic and Social Geography*, *85*, 249-262. doi: 10.1111/j.1467-9663.1994.tb00693.x

Blattman, C., & Miguel, E. (2010). Civil war. *Journal of Economic Literature*, 48, 3-57. doi:10.1257/jel.48.1.3

Bonikowska, A., & Morissette, R. (2012). *Earnings losses of displaced workers with stable labour market attachment: recent evidence from Canada*. Ottawa, Canada: Statistics Canada

Bourguignon, F., Nuñez, J., & Sanchez, F. (2003). A structural model of crime and inequality in Colombia. *Journal of the European Economic Association*, *1*, 440-449. doi: 10.1162/154247603322391071

Calderón-Mejía, V., & Ibáñez, A. M. (2016). Labour market effects of migration-related supply shocks: evidence from internal refugees in Colombia. *Journal of Economic Geography*, *16*, 695-713. doi: 10.1093/jeg/lbv030

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, *22*, 31-72. doi: 10.1111/j.1467-6419.2007.00527.x

Card, D. (1990). The impact of the Mariel boatlift on the Miami labor market. *ILR Review*, *43*, 245-257. doi: 10.1177/001979399004300205

Castilla, E. J. (2005). Social networks and employee performance in a call center. *American Journal of Sociology*, *110*, 1243-1283. doi: 10.1086/427319

Chambers, R. (1986). Hidden losers? The impact of rural refugees and refugee programs on poorer hosts. *International Migration Review*, 20, 245-263. doi: 10.2307/2546034

Couch, K. A., & Placzek, D. W. (2010). Earnings losses of displaced workers revisited. *American Economic Review*, *100*, 572-589. doi: 10.1257/aer.100.1.572

Dehejia, R. H., & Wahba, S. (1999). Causal effects in nonexperimental studies: Reevaluating the evaluation of training programs. *Journal of the American Statistical Association*, *94*, 1053-1062. doi: 10.2307/2669919

Dehejia, R. H., & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *The review of economics and statistics*, *84*, 151-161. doi: 10.1162/003465302317331982.

Deininger, K. (2003). Causes and consequences of civil strife: micro-level evidence from Uganda. *Oxford Economic Papers, 55, 579-606.* doi: 10.1596/1813-9450-3045

Eliason, M., & Storrie, D. (2006). Lasting or latent scars? Swedish evidence on the long-term effects of job displacement. *Journal of Labor Economics*, *24*, 831-856. doi: 10.1086/506487

Engel, S., & Ibáñez, A. M. (2007). Displacement due to violence in Colombia: A household-level analysis. *Economic Development and Cultural Change*, *55*, 335-365. doi: 10.1086/508712

Fields, G. S. (1979). Place-to-place migration: Some new evidence. *The Review of Economics and Statistics*, 61, 21-32. doi: 10.2307/1924827

Fields, G. S., & Schultz, T. P. (1980). Regional inequality and other sources of income variation in Colombia. *Economic Development and Cultural Change*, *28*, 447-467. Retrieved from http://www.jstor.org/stable/1153682

Fraker, T., & Maynard, R. (1987). The adequacy of comparison group designs for evaluations of employment-related programs. *Journal of Human Resources*, 22, 194-227. doi: 10.2307/145902

Garay, L. J., & Barberi, F. (2009). *El reto ante la tragedia humanitaria del desplazamiento forzado: reparar de manera integral el despojo de tierras y bienes. [The challenge before the humanitarian tragedy of forced displacement: repairing in an integral way the dispossession of lands and goods].* Comisión de seguimiento a la política pública sobre desplazamiento forzado, Colombia.

Heckman, J. (1979). Sample Selection Bias as a Specification Error. *Econometrica, 47*, 153-161. doi:10.2307/1912352

Heckman, J., Ichimura, H., & Todd, P. (1998). Matching As An Econometric Evaluation Estimator. *Review of Economic Studies, 65, 261-294*.

Hijzen, A., Upward, R., & Wright, P. W. (2010). The income losses of displaced workers. *Journal of Human Resources*, *45*, 243-269. doi: 10.3368/jhr.45.1.243

Ibanez, A. M. (2009). Forced displacement in Colombia: Magnitude and causes. *The Economics of Peace and Security Journal*, *4*, 48-54. doi: 10.15355/epsj.4.1.48

Ibáñez, A. M., & Moya, A. (2006). The impact of intra-state conflict on economic welfare and consumption smoothing: Empirical evidence for the displaced population in Colombia. doi:10.2139/ssrn.1392415.

Ibáñez, A. M., & Moya, A. (2007). *¿Cómo el desplazamiento forzado deteriora el bienestar de los hogares desplazados? Análisis y determinantes del bienestar en los municipios de recepción [How does forced displacement deteriorate the well-being of displaced households? Analysis and determinants of welfare in reception municipalities]*. Documentos CEDE from Universidad de los Andes-CEDE, https://EconPapers.repec.org/RePEc:col:000089:003789

Ibáñez, A. M., & Moya, A. (2010). Vulnerability of victims of civil conflicts: empirical evidence for the displaced population in Colombia. *World Development*, *38*, 647-663. doi: 10.1016/j.worlddev.2009.11.015

Ibáñez, A. M., & Querubín, P. (2004). Acceso a tierras y desplazamiento forzado en Colombia *[Access to land and forced displacement in Colombia]*. Documento Cede, 23, 1-114. Retrieved from http://www.acnur.org/t3/uploads/media/COI_2497.pdf

Ibáñez, A. M., & Velásquez, A. (2008*). El impacto del desplazamiento forzoso en Colombia: condiciones socioeconómicas de la población desplazada, vinculación a los mercados laborales y políticas públicas [The impact of forced displacement in Colombia: socio-economic conditions of the displaced population, linkage to labor markets and public policies]*. Retrieved from http://www.cepal.org/publicaciones/xml/2/35022/sps145-Desplazamiento-Colombia.pdf

Ibáñez, A. M., & Vélez, C. E. (2008). Civil conflict and forced migration: The micro determinants and welfare losses of displacement in Colombia. *World Development*, *36*, 659-676. doi:10.1016/j.worlddev.2007.04.013

Jacobson, L. S., LaLonde, R. J., & Sullivan, D. G. (1993). Earnings losses of displaced workers. *American Economic Review*, 83, 685-709. Retrieved from http://www.jstor.org/stable/2117574

Jalan, J., & Ravallion, M. (2003). Estimating the benefit incidence of an antipoverty program by propensity-score matching. *Journal of Business & Economic Statistics*, *21*, 19-30. doi: 10.1198/073500102288618720

Kondylis, F. (2008). Agricultural outputs and conflict displacement: Evidence from a policy intervention in Rwanda. *Economic Development and Cultural Change*, *57*, 31-66. doi: 10.1086/590446

Kondylis, F. (2010). Conflict displacement and labor market outcomes in post-war Bosnia and Herzegovina. *Journal of Development Economics*, *93*, 235-248. doi: 1016/j.jdeveco.2009.10.004

LaLonde, R. J. (1986). Evaluating the econometric evaluations of training programs with experimental data. *American Economic Review*, 604-620. Retrieved from http://www.jstor.org/stable/1806062

Meertens, D., & Stoller, R. (2001). Facing destruction, rebuilding life: Gender and the internally displaced in Colombia. *Latin American Perspectives*, *28*, 132-148. Doi: 10.1177/0094582X0102800108
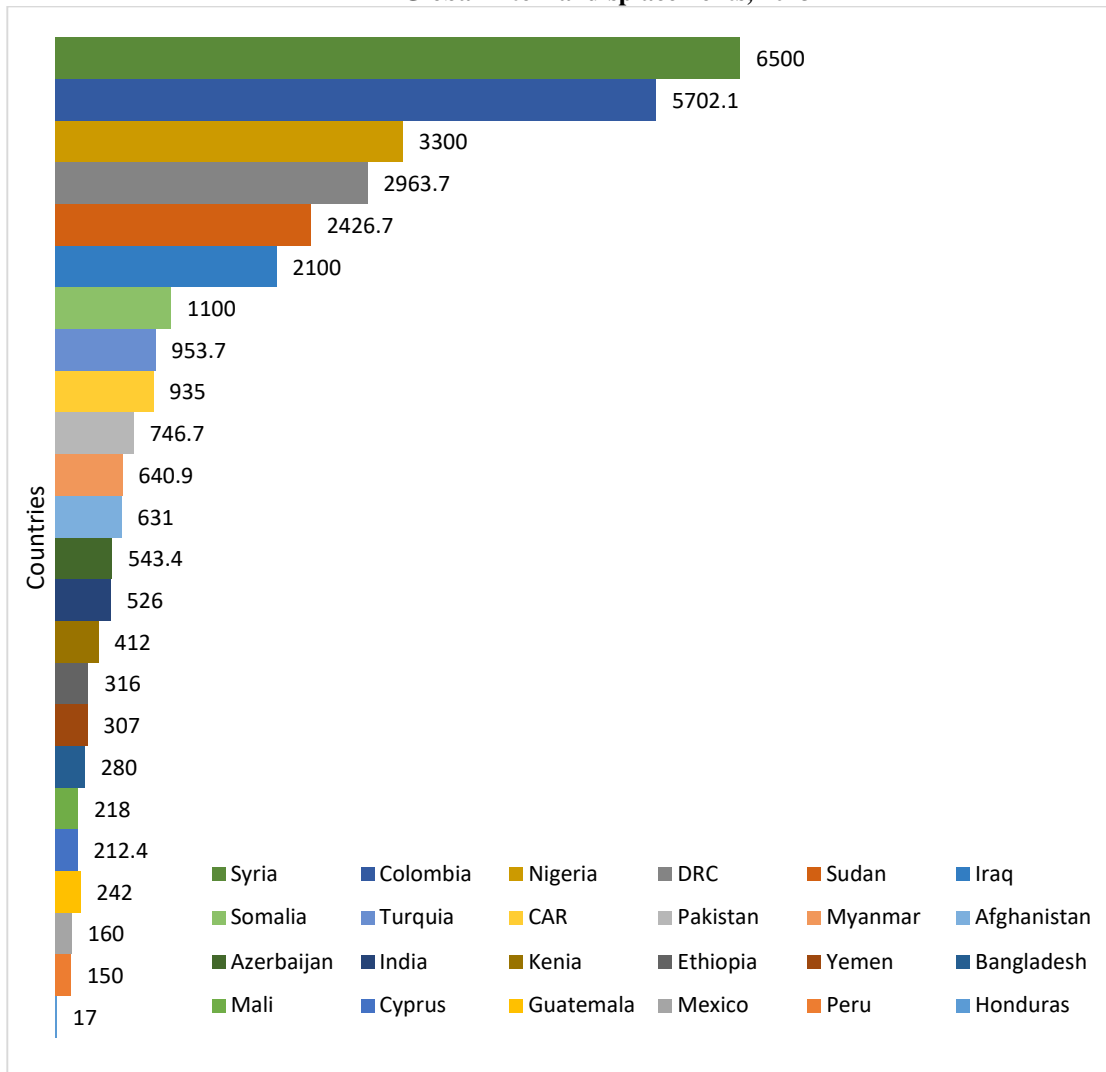
Mohan, R., & Sabot, R. (1988). Educational Expansion and the Inequality of Pay: Colombia 1973–78. *Oxford Bulletin of Economics and Statistics*, *50*, 175-182. doi: 10.1111/j.1468-0084.1988.mp50002005.x

Mouw, T. (2003). Social capital and finding a job: do contacts matter?. *American Sociological Review*, 68, 868-898. Retrieved from http://www.jstor.org/stable/1519749

Ramírez, C., Zuluaga, M., & Perilla, C. (2010). *Perfil migratorio de Colombia [Migratory profile in Colombia]*. Organización Internacional para las Migraciones (OIM), Colombia.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, *70*, 41-55. doi:10.2307/2335942

Sanders, J. M., & Nee, V. (1996). Immigrant self-employment: The family as social capital and the value of human capital. *American Sociological Review*, 231-249. Retrieved from http://www.jstor.org/stable/2096333

Seguino, S. (2000). Gender inequality and economic growth: A cross-country analysis. *World Development*, *28*, 1211-1230. doi: 10.1016/S0305-750X(00)00018-8

Seim, D. (2012). *Job displacement and labor market outcomes by skill level*. Eesti Pank University Working Paper Series Nº 4/2012.

United Nations High Commissioner for Refugees (UNHCR). (2015). "Worldwide Displacement Hits All-Time High as War and Persecution Increase." Press release, June 18, 2015. Geneva: UNHCR. Retrieved from http://www.unhcr.org/558193896.

Weichselbaumer, D., & Winter-Ebmer, R. (2005). A meta-analysis of the international gender wage gap. *Journal of Economic Surveys*, *19*, 479-511. doi: 10.1111/j.0950-0804.2005.00256.x

World Bank (2017). *Forcibly Displaced: Toward a Development Approach Supporting Refugees, the Internally Displaced, and Their Hosts*. Washington, DC: World Bank. doi: 10.1596/978–1-4648–0938–5

Figure 1
Forced displacements in Colombia, 1985-2013
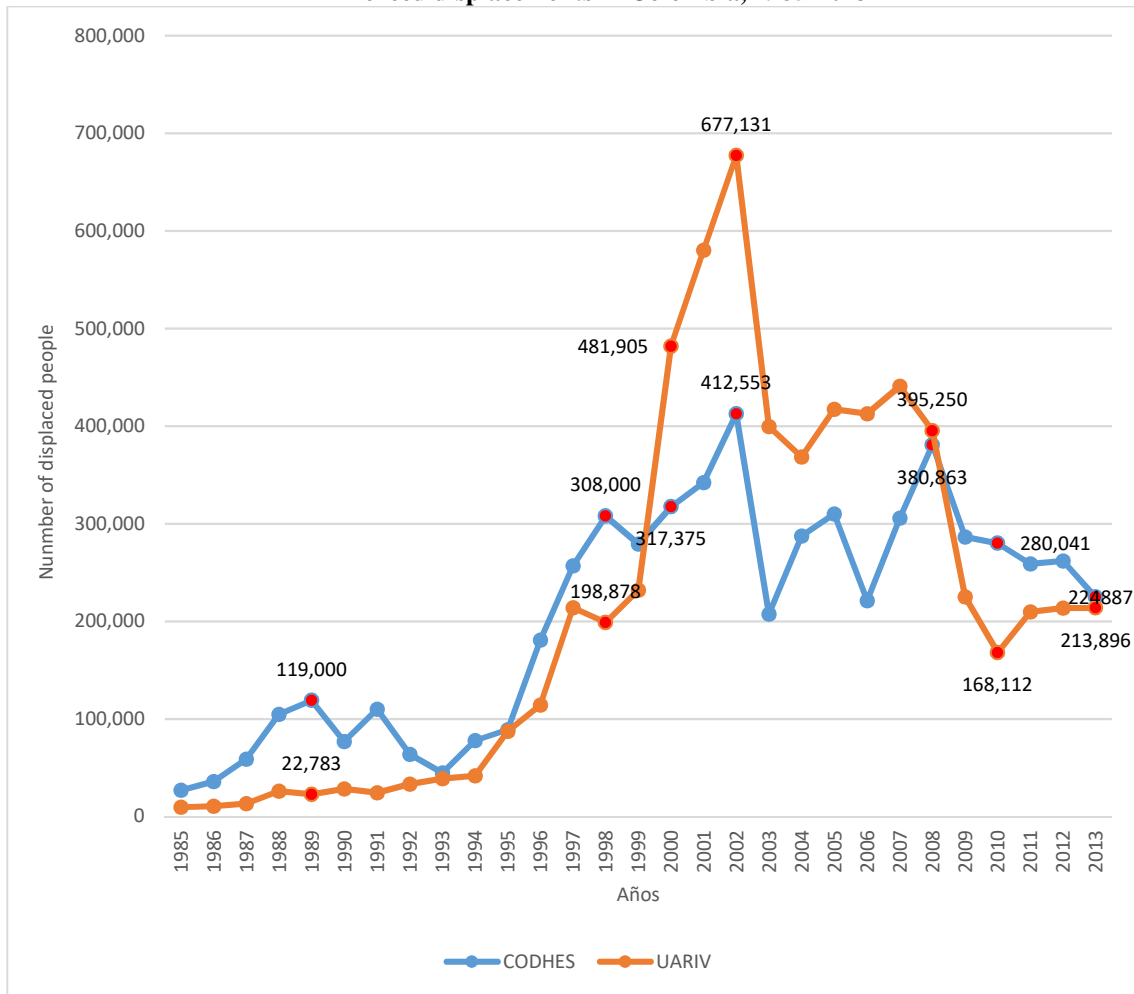
Notes: Author's calculation. CODHES is the acronym for "Consultoria para los derechos humanos y el desplazamiento", a private institution collecting statistics on human rights, including statistics for forced displacements. UARIV is the acronym for "Unidad para la atención y reparación integral a las víctimas".

Figure 2
Global Internal displacements, 2013

■ Syria	■ Colombia	■ Nigeria	■ DRC	■ Sudan	■ Iraq
■ Somalia	■ Turquia	■ CAR	■ Pakistan	■ Myanmar	■ Afghanistan
■ Azerbaijan	■ India	■ Kenia	■ Ethiopia	■ Yemen	■ Bangladesh
■ Mali	■ Cyprus	■ Guatemala	■ Mexico	■ Peru	■ Honduras

Notes: Authors calculations using the data from the "Observatorio de Desplazamiento Interno (IDMC)".

Table 1.
Probit model for estimation of score

Probit for Propensity Score	(1) Males	(2) Females
Age 18-29	0.002	0.231
	(0.053)	(0.095)
Age 30-40	0.041	0.217
	(0.054)	(0.097)
Age 41-50	-0.017	0.016
	(0.057)	(0.105)
Region of residence	-0.016	0.029
	(0.007)	(0.012)
Level of education	-0.257	-0.267
	(0.021)	(0.031)
Civic status	-0.027	-0.003
	(0.019)	(0.017)
Physical place of work	0.032	0.031
	(0.006)	(0.012)
Ownership of dwelling	0.133	0.075
	(0.024)	(0.035)
How do you feel in your place of residence?	-0.184	-0.264
	(0.024)	(0.038)
In relation to the home where you were born, now your life is	-0.032	-0.062
	(0.030)	(0.046)
Status for electricity rate	-0.160	-0.105
	(0.041)	(0.080)
Type of dwelling	-0.026	0.030
	(0.015)	(0.024)
Running water	0.178	0.300
	(0.040)	(0.058)
Constant	-0.397	-0.538
	(0.146)	(0.225)
N Observations	11,554	3,831
Pseudo R-squared	0.070	0.096

Notes: Standard errors in parentheses. The sample includes respondents who are 18-60 years old, are not retired, and not students, from the Quality of Life Survey (2011-2014) in Colombia. The displaced by violence are defined as those individuals responding "Risk to my life, freedom, or physical integrity, caused by violence" to the question "What is the main reason you changed your residence to the current place?", while the displaced for other reasons choose other responses (e.g., education, labor market opportunities…) to the same question. *Significant at the 90 percent level; **significant at the 95 percent level; ***significant at the 99 percent level.

Table 2.
Average Treatment Effect, displaced by violence vs. displaced for other reasons

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Males					**Females**		
	Displaced by violence (obs)	Moved other reasons (obs)	Average Treatment Effect	Standard error	T-statistic	Displaced by violence (obs)	Moved other reasons (obs)	Average Treatment Effect	Standard error	T-statistic
Nearest neighbor matching	1244	1439	-0.101	(0.033)	(3.065)	572	470	-0.178	(0.068)	(2.636)
Stratification matching	1244	10160	-0.174	(0.022)	(7.758)	570	3146	-0.191	(0.043)	(4.402)
Radius matching (0.001)	1237	9975	-0.294	(0.024)	(12.345)	551	2820	-0.371	(0.047)	(7.884)
Kernel-based matching	1244	10160	-0.270	(0.023)	(11.728)	572	3144	-0.270	(0.049)	(5.530)

Notes: Robust standard errors in parentheses. The sample includes respondent who are 18-60 years old, are not retired, and not students, from the Quality of Life Survey (2011-2014) in Colombia. The displaced by violence are defined as those individuals responding "Risk to my life, freedom, or physical integrity, caused by violence" to the question "What is the main reason you changed your residence to the current place?", while the displaced for other reasons choose other responses (e.g., education, labor market opportunities…) to the same question. The Average Treatment Effect (ATT) is calculated as the difference in the log of wages between the treatment (those displaced by violence) and control (moved for other reasons) groups. The t-statistic is calculated as the ratio of the (absolute value) Average Treatment Effect and the Standard Error.