



Adjusting the Labour Supply to Mitigate Violent Shocks: Evidence from Rural Colombia

Manuel Fernández, Ana María Ibáñez & Ximena Peña

To cite this article: Manuel Fernández, Ana María Ibáñez & Ximena Peña (2014) Adjusting the Labour Supply to Mitigate Violent Shocks: Evidence from Rural Colombia, The Journal of Development Studies, 50:8, 1135-1155, DOI: [10.1080/00220388.2014.919384](https://doi.org/10.1080/00220388.2014.919384)

To link to this article: <https://doi.org/10.1080/00220388.2014.919384>



View supplementary material [↗](#)



Published online: 18 Jul 2014.



Submit your article to this journal [↗](#)



Article views: 831



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 14 View citing articles [↗](#)

Adjusting the Labour Supply to Mitigate Violent Shocks: Evidence from Rural Colombia

MANUEL FERNÁNDEZ*, ANA MARÍA IBÁÑEZ** & XIMENA PEÑA**

*Department of Economics, Oxford University, Oxford, UK, **Department of Economics, Universidad de Los Andes, Bogotá, Colombia

Final version received January 2014

ABSTRACT *We study the use of labour markets to mitigate the impact of violent shocks on households in rural areas. Because the incidence of violent shocks is not exogenous, the analysis uses instrumental variables. As a response to violent shocks men decrease the time they devote to off-farm agricultural activities and increase off-farm non-agricultural activities, while women decrease their leisure time and increase the time they devote to household chores and childcare. Labour markets appear unable to fully absorb the additional labour supply. Policies in conflict-affected countries should aim to prevent labour markets from collapsing.*

1. Introduction

The dynamics of internal conflicts impose shocks on civilian populations. Armed confrontations, looting, and aggression against civilians harm particular groups within the population, while other groups may benefit. The transmission channels of violent shocks are manifold: asset depletion, drops in agricultural production, human capital losses, and a weakening of insurance mechanisms, among others (Brück, 2004a; Camacho, 2008; Justino & Verwimp, 2006; Shemyakina, 2006; Stewart & Fitzgerald, 2001). Households in regions experiencing conflict are not defenceless and devise resourceful strategies for alleviating the impact of violent shocks. These range from traditional strategies aimed at mitigating shocks to forced migration, participation in illegal activities, and the supporting of armed groups (Engel & Ibáñez, 2007; Justino, 2009).

Even where not directly victimised, households within conflict regions may face short- and long-term economic costs. Conflict limits market transactions, increases transaction costs, reduces demand for market goods, and generates uncertainty, among other effects. Households face additional variability over and above the traditional effects associated with income – so prevalent in rural areas – as well as a restricted capacity to generate income. In addition, relying on ex-ante and ex-post strategies in order to mitigate risk is difficult since access to financial markets and risk-insurance mechanisms becomes more limited in conflict regions, or is severely depleted when populations are forced to migrate (Brück, 2004b; Ibáñez & Moya, 2010).

Understanding the strategies that households employ to cope with violent shocks is crucial to reducing the short- and long-term costs of conflict. An inability to completely insure against shocks pushes households to adopt costly mitigating strategies. Although these strategies compensate for income drops

Correspondence Address: Professor Ximena Peña, Universidad de Los Andes, Department of Economics, Calle 19 A No. 1-37 Este, Bogotá, Colombia. Email: xpena@uniandes.edu.co

An Online Appendix is available for this article which can be accessed via the online version of this journal available at <http://dx.doi.org/10.1080/00220388.2014.919384>

in the short term, their long-term implications may perpetuate poverty by decreasing human capital accumulation, generating malnutrition, necessitating child labour, and producing a depletion of productive assets (Barret & Carter, 2006; Behrman, 1988; Jacoby & Skoufias, 1997; Jensen, 2000). Evidence for violent shocks suggests similar impacts, but the effects are much larger (Akresh, Verwimp, & Bundervoet, 2011; Bundervoet, Verwimp, & Akresh, 2009; Justino & Verwimp, 2006).

When labour markets are flexible, supplying labour in non-agricultural markets presents an alternative to hedging against risks (Cameron & Worswick, 2003; Ito & Kurosaki, 2009; Kochar, 1999; Rose, 2001). By increasing the number of working hours or shifting from on-farm to off-farm labour activities, households may be able to maintain consumption and avoid having to adopt costly strategies.

The empirical evidence for labour markets as a risk management mechanism within the context of conflict is small. Moreover, most research-examining strategies adopted by households in order to hedge against traditional shocks assume that the labour supply remains fixed. Menon and Rodgers (2011) find that the conflict in Nepal pushed women to participate in labour markets, yet the expansion in the labour supply was mostly driven by the need to supplement income and not by an expansion in labour demand. Other studies concentrate on the impact of forced displacement on labour markets (see, for example, Calderón & Ibáñez, 2009; Kondylis, 2010).

The purpose of this paper is to examine how labour markets contribute to mitigating shocks due to conflict. First, we establish how households redistribute time use when responding to conflict shocks. Second, we study whether off-farm work is directed at formal labour markets or subsistence activities. Third, we explore whether responses are heterogeneous by gender in order to determine whether the welfare losses generated by responses to shock are borne differently by men and women. Finally, we identify whether an increase in labour supply is an effective strategy for countervailing, or at least reducing, the impact of shocks.

We use data from Colombia, a country that has experienced a long-standing conflict for over 50 years. Evidence regarding coping strategies adopted by households that decide to stay in conflict zones is scarce. Results show that non-agricultural labour markets are used as an alternative means for coping with covariate conflict shocks. In addition, changes in time use are starkly different for men and women. Men decrease the time they devote to off-farm agricultural activities and increase their off-farm non-agricultural activities. In contrast, women decrease their leisure time and increase the time they devote to household chores and caring for children and other family members. Two complementary mechanisms may explain these changes in time use. On the one hand, conflict may cause drops in agricultural production, thus forcing households to seek employment outside their land plot. On the other hand, households may prefer to confine themselves to their land plot in order to reduce interactions with the community and prevent potential future victimisation. While conflict shock reduces consumption, the additional supply provided in labour markets compensates for this negative impact.

The second contribution of this paper is its estimation of the causal relationship between conflict shocks and labour outcomes. Establishing causality is difficult because incidences of violent shocks are not exogenous. The presence of armed groups and attacks on the civilian population are linked with the possibility of armed groups extracting natural resources to fund war activities. Because we have a rich data set, consisting of municipal and rural district (*vereda*¹) characteristics, we find an instrumental variable related to the causes of conflict, namely the presence of the native population during colonial times (between 1535 and 1540), yet this does not directly affect labour outcomes. Regions that were depopulated of the native population during colonial times became frontier regions in which land disputes erupted. These are the same areas in which violent conflict occurred between the 1930s and the 1950s; in many of these regions, which are also strongholds for rebel groups, violence resumed at the end of the twentieth century. We expect this variable to be highly correlated with incidences of violent shocks, yet not to determine labour outcomes.

The structure of the paper is as follows. Section 2 presents the characteristics of violent events and a first approximation of the economic consequences of violent conflict on rural districts. Section 3 subsequently describes our empirical strategy, the data, and the empirical results. In Section 4 we conclude and discuss policy recommendations.

2. Violent Shocks

Colombia has experienced a long-standing conflict for over 50 years.² Despite the negotiation talks that President Santos started in 2012 with Fuerzas Armadas Revolucionarias de Colombia (FARC), the largest guerrilla group in Latin America, until now guerrilla groups have continued to operate in isolated areas of the country, while some paramilitary groups have mutated into drug dealing organisations. For example, homicide rates have declined since 1991, reaching their lowest level in 20 years of 35.52 as of 2009. Nevertheless, the homicide rate continues to be high when compared with international standards.

We characterise violent events according to responses to the rural district questionnaire of the Encuesta Longitudinal Colombiana de los Andes (ELCA). Table 1 reports on the results for questions in the rural district questionnaire that relate to conflict and aggression against the civilian population. The results show that the presence of armed groups during the last 10 years has been frequent within the four regions, ranging from 15.8 per cent of rural districts in the Atlantic Region to 44.1 per cent of rural districts in the Southern Region. Direct violent attacks against the population are widespread, while aggression that causes immediate economic consequences is less frequent. For example, in the Southern Region, threats were reported in 20.3 per cent of rural districts, whereas the illegal seizure of livestock, expropriation of land, and/or illegal seizure of crops occurred in 8.5, 5.1, and 3.4 per cent of rural districts, respectively. Interestingly, the imposition of the rule of armed groups upon a community is often reported in rural districts, ranging from 8 per cent in the Atlantic Region to 23.7 per cent in the Southern Region; armed groups are not contested in these communities and are therefore at ease when defining their own sets of rules. A first approximation of the economic consequences of violent conflict on rural districts is presented in Table B1 in the Online Appendix. Respondents identify rural households that have had to abandon crops, stop investment in land plots, or stop producing traditional crops due to conflict during the last two years. Nonetheless, the economic consequences of conflict occur much less frequently than direct aggression against the civilian population. In fact, direct aggression does not necessarily seem to produce economic consequences with respect to conflict. Thus, although the Southern Region experiences more violent attacks against the population, the Coffee Region more frequently reports economic impacts produced by the conflict.

3. Data and Empirical Strategy

This paper studies the extent to which rural households in Colombia change their labour supply in order to prevent the reductions in consumption brought about by conflict shocks. In order to compensate for welfare losses from conflict shocks, households may redistribute their use of time between on-farm and off-farm activities between members. Consequently, their participation in formal non-agricultural labour markets or in occasional work on other farms may increase.

Table 1. Presence of armed groups and aggressions against the population

	Region			
	Atlantic	Central	Coffee-growing	Southern
Presence of armed groups in the community in 2001–2010	15.79%	25.00%	36.21%	44.07%
Threats	7.02%	12.50%	20.69%	20.34%
Assaults	3.51%	6.25%	12.07%	10.17%
Imposed rules	7.02%	2.08%	15.52%	23.73%
Extortions	3.51%	10.42%	10.34%	8.47%
Expropriated land	1.75%	2.08%	0.00%	5.08%
Seized livestock illegally	0.00%	2.08%	0.00%	8.47%
Seized crops illegally	0.00%	2.08%	3.45%	3.39%
Total number of communities	57	48	58	59

Source: ELCA: First wave, community questionnaire.

3.1 The Data

The rural sample of the ELCA largely covers small agricultural producers and is representative of four micro-regions: the Atlantic, Central, Coffee-growing, and Southern Regions. Regions were selected based on their respective conflict dynamics, the size of land plots, the land ownership arrangements (formal versus informal), per capita income growth, and whether the natural markets for their agricultural produce are located in the urban sample. Within each of the 17 municipalities the rural districts were chosen randomly, with 222 rural districts in total.³ The size of the rural sample is 4800 households and each micro-region's sample covers around 1200 households.⁴ The first wave, used in this paper, was collected between February and July 2010.

The survey collects standard information about changes in household behaviour, including those related to employment, income, education, health, and family formation. Additionally, we collect data on land tenure and property rights, consumption, expenditure, agricultural production, asset ownership, child development, and social capital. A time use module is included in the rural survey. We have also collected information at the rural district level on issues affecting the community as a whole, including information about social and public infrastructure, incidences of land conflict, and the presence of illegal armed groups.

3.2 The Model and Empirical Strategy

We have a very simple framework in mind in order to better understand the specific ways in which a violent shock may affect the consumption of rural households, and how changes in the allocation of time may help to buffer against such shocks. Suppose that households choose consumption and leisure levels to maximise their utility function:

$$\begin{aligned} & \text{Max}_{C,H,F} U(C, L) \\ & \text{s.t. } wH + \pi(F; A, \bar{K}, w, r, P, \theta) = PC \\ & \bar{T} = H + F + L, \end{aligned}$$

where C denotes consumption and L leisure. \bar{T} is the total amount of time available to a rural household that can be devoted to off-farm work (labour market), H , to on-farm work, F , or to leisure, L . We assume the existence of a labour market in which agents may work for a wage, w . The household's income is comprised of the household's profit function, which depends on the land's productivity, A , the productive assets, \bar{K} , the prices of the productive inputs, w , the opportunity cost of devoting time to farm work instead of working in the labour market, and r , the rental price of capital, as well as the price of goods, P . Profits may also be affected by a violent shock, θ . The profit function fulfils the conditions of the standard neo-classical problem. In addition, we assume that when a violent shock occurs, the farm's profits decrease.

Assuming an interior solution, the first-order condition of the problem with respect to on-farm time captures the trade-off generated by the fact that an additional hour of on-farm work generates increased farm profits but also generates disutility. The first-order condition with respect to off-farm work, H , captures a similar trade-off: a household working an additional hour of work in the labour market receives w , which can be used to finance consumption, but which also generates disutility. Combining the previous expressions, we find that the allocation of off-farm and on-farm work must be such that the additional profit for on-farm work should equal its opportunity cost, $\pi_F = w$.

In a partial equilibrium model with the absence of labour markets, the full impact of the violent shock would translate into a decrease in consumption. If labour markets were available then the occurrence of a violent shock would render on-farm work less profitable and market work more attractive, thus generating a reassignment of time between the two and preventing the shock from being fully translated into reductions in consumption. This is the insight that we wish to emphasise.

General equilibrium effects may cause a similar shift. Forced displacement may contract the supply of non-farm labour, increasing wages and thus creating incentives to shift from agricultural to non-agricultural labour. Higher wages, experienced either directly or through increased household income, may drive up the demand for leisure. This story holds if the people forcefully displaced predominantly work in the non-agricultural sector, which does not appear to be the case in Colombia.⁵

This evidence suggests that general equilibrium effects may not play a large role in explaining the rise in wages. Shifts from agricultural to non-agricultural labour may indeed result from a decrease in agricultural income caused by violent shocks.

Our empirical framework follows the intuition presented above. The aggregate consumption of household i in rural district j located in region k depends on the farm's productivity, Y_{ijk} , hours worked, H_{ijk} , household characteristics that capture preferences and life-cycle factors, X_{ijk} , rural district controls, Z_{jk} , a dummy variable, V_{jk} , that equals one if the rural district has faced a covariate conflict shock, and a random error, ε_{ijk} :

$$C_{ijk} = \beta_0 + \beta_k + \beta_Y Y_{ijk} + \beta_H H_{ijk} + \beta_X X_{ijk} + \beta_Z Z_{jk} + \beta_V V_{jk} + \varepsilon_{ijk},$$

where β_k are regional fixed effects. To proxy for the farm's productivity we include the standardised size of the household's land plot in hectares and the size of land plot at the time of the household's creation, as well as a dummy that captures whether the household faced problems with production due to land quality and the share of livestock income in agricultural and livestock income.

The household characteristics included account for preferences and vulnerability: variables capturing the life cycle (age and age squared) and the level of education of the household head. We include variables that account for household composition, such as female headship, the number of children under five years of age, the number of children between five and 18 years of age, the number of household members above 65 years of age, and the number of members of the extended family.⁶ In addition, we include a dummy that captures whether the household is a beneficiary of the government cash transfer programme *Familias en Acción*. To measure household wealth we use a standardised index of durable goods ownership.⁷

We include several characteristics of the land plot to control for variables that determine agricultural productivity and formality of property rights, such as a dummy variable equal to one if the land plot has a formal legal title, the standardised size of the land plot, a soil erosion index, average rainfall during the last 20 years, the number of months during the previous year that rain was one standard deviation below the mean, and the number of months during the previous year that rain was one standard deviation above the mean. We also include characteristics of each rural district that affect agricultural productivity: a dummy variable equal to one if the district faces problems with agricultural production due to the quality of the land, and the altitude of the rural district. Finally, we control for the municipal average number of attacks by armed groups per 100,000 inhabitants during the period 1997–2003. Since Colombia has faced almost 50 years of conflict, it is important to control for the previous history of conflict in the municipality. For aggregate consumption we also control for the standardised size of the land plot when the household was formed and the daily agricultural wage.

If a violent shock occurs and households are not fully insured then the drop in income transfers to consumption. Households may expand their labour supply in order to prevent the shock leading to reductions in consumption. If this is the case, the coefficient estimate for β_H is overestimated, mistakenly showing that households are less able to smooth out consumption and that a larger proportion of the negative shock translates into reductions in consumption.

The equation for hours of off-farm work supplied by a person in household i in rural district j and region k is:

$$H_{ijk} = \alpha_0 + \alpha_k + \alpha_Y Y_{ijk} + \beta_X X_{ijk} + \alpha_W Z_{jk} + \alpha_V V_{jk} + \mu_{ijk},$$

where μ_{ijk} is a random error. The variables included in the estimation are the same as those included in the consumption estimation. The equation for hours of on-farm work is very similar.

Besides identifying the impact of covariate violent risk on the distribution of time dedicated to on-farm and off-farm work, we explore whether off-farm work is supplied to formal labour markets or occasional agricultural activities, presumably at nearby farms. Increments in the amount of labour attached to formal labour markets would be an unexpected and positive impact of covariate conflict shocks. If off-farm hours of work are dedicated to subsistence activities, increments in the labour supply are a temporary response for coping with conflict shocks. We estimate two regressions in order to explore participation in formal labour markets: whether the person worked for a salary during the past 12 months and whether the person tried to find a job. We include the same determinants as for the hours of work estimations.

One issue about our empirical strategy is worth discussing. Armed groups seek to strengthen territorial control in regions considered valuable for strategic purposes, such as those related to political motives or the likelihood of extracting valuable resources. Violent conflict and the actions of rebel groups against a population are more likely in regions with political grievances or in which the extraction of rents provides funds for financing war activities or augmenting combatants' loot. However, exercising territorial control is costly. Our identification strategy is to exploit the variation across the 222 rural districts and use an instrumental variable that captures one dimension that influences the costs of exercising terror. We exploit the historical path dependence of the Colombian conflict to find one instrumental variable that is highly correlated with the incidence of violent conflict in municipalities, but which does not determine labour outcomes today. We use a dummy for the presence of the native population during colonial times (1535–1540) as a proxy for the historical presence of rebel groups. Initial colonial settlements in Colombia exist in regions with a presence of the native population. The other regions exhibited one distinct feature during *La Violencia*: having been depopulated of the native population during colonial times, these areas became frontier regions in which land disputes erupted. Land disputes due to incomplete property rights in these regions at the end of the nineteenth century erupted into violent conflict during the 1930s and into the 1950s. Violence in many of these regions resumed at the end of the twentieth century, showing a strong path dependence of conflict. Fernández (2012) shows that the municipal incidence of the current conflict is highly correlated with municipal violence during *La Violencia* and the presence of the native population in colonial times: 48 per cent of the Colombian municipalities not affected by violence today were initial colonial settlements, while this figure is only 24 per cent for municipalities affected by violence. Thus, our instrumental is highly correlated to the incidence of violent shocks.

A potential threat to our estimation strategy would exist if the presence of the native population during colonial times (1535–1540) affects time use and insertion into formal labour markets through other channels besides violent covariate shocks. One potential channel is the informality of property rights. However, we include a rich set of controls for land tenancy status, land quality, geographic characteristics, and regional fixed effects in order to account for this. The presence of the native population during colonial times is only correlated with labour outcomes through covariate shocks once we control for all of these variables.

3.3 Descriptive Statistics

We can define two types of violence-related shocks: idiosyncratic and covariate. The first comprise deliberate aggressions against particular households, such as the destruction of household goods or direct victimisation. Households that are directly victimised or who face a high risk of victimisation frequently become displaced.⁸ The households in our survey were not likely to be directly victimised; ours is a sample of 'stayers' with a low likelihood of facing idiosyncratic shocks. Because of the low

Table 2. Incidences of violent shocks

Type of shock	Communities affected	Households affected
Murder	11.27%	14.30%
Land expropriation	0.98%	1.28%
Threats by armed groups	4.41%	4.26%
Kidnappings	1.47%	1.57%
At least one violent shock	15.69%	18.95%
N	204	3,050
Total number of shocks	37	653

Source: ELCA: First wave, community questionnaire.

prevalence of idiosyncratic shocks, as well as the potential report problem, we focus on covariate shocks. We have built a covariate shock based on a detailed conflict module of the rural district questionnaire. It captures the occurrence of kidnappings, land expropriations, extortions, and threats from armed groups, as well as murders in the past 12 months.⁹ Responses are general for the community and do not identify particular community members. Since we focus on covariate shocks, even though we use information at the household level, the violent shocks are measured at the community, not household, level.

Table 2 displays the prevalence of covariate shocks in the sample, both in terms of the percentage of rural districts and the percentage of households in our sample that belong to those districts and hence are affected by the shocks. The most prevalent type of shock is homicide, which affects 14.3 per cent of rural districts and 11.3 per cent of households, followed by threats by armed groups. Land expropriation and kidnapping are less frequent.

As discussed earlier, labour markets may constitute an alternative for hedging against ex-ante and ex-post risks if labour markets are flexible and non-agricultural wages have a low correlation with agricultural profits. Households may use labour markets to minimise the impact of conflict shocks. Therefore, the percentage of the total income coming from labour income may be viewed as a measure of the dependence of households on agricultural and livestock income. Table 3 shows that households living in districts affected by at least one violent shock have a similar percentage of their total income coming from labour market activities. Armed groups appear to attack rural districts with households that have a higher income derived from agriculture and livestock activities. This purposeful targeting may be directed at households with land plots of a larger size and/or of better quality. Labour income, which is less visible, seems to be less frequently targeted by armed groups.

Table 3. Household income: descriptive statistics

	Violent shock	No violent shock	Difference between means (t-test)	All
Total income	2,123,979 (6,945,324)	1,713,103 (6,396,468)		1,790,967 (6,504,851)
Agricultural production income	957,754 (2,453,729)	885,129 (4,676,787)		898,892 (4,343,523)
Livestock production income	931,093 (6,384,414)	607,134 (3,730,185)		668,527 (4,359,625)
Labour income	336,284 (767,342)	256,982 (435,031)	***	273,198 (521,215)
Labour income as share of total income	0.24 (0.28)	0.21 (0.26)		0.22 (0.27)

Notes: Standard errors in parenthesis.

Source: ELCA: First wave, household questionnaire.

The correlation between labour income and agricultural income is 0.11 (0.04) for households living in districts that have experienced (have not experienced) a violent shock during the past year. The correlation between livestock and labour income is not statistically significant and equals 0.02 for both types of household.

The correlation of income within the same rural district determines the ability of households to insure against violent shocks. If incomes are highly correlated then relying on other community members to cope with shocks is difficult. Because regions with violent shocks are often isolated from urban centres and might be more closely knit, the correlation of incomes may be high. In this case, full insurance against shocks is highly unlikely; hence, labour markets are an important alternative. Table B2 in the Online Appendix reports income correlation within each rural district for districts with and without violent covariate shocks. Even though total income is slightly more correlated for rural districts that have not experienced violent shocks, the correlation of labour income is much higher for communities with covariate shocks. The difference for rural districts with and without covariate shocks is not statistically significant.

We use a dummy variable for presence of the native population during colonial times (1535–1540) as an instrument for covariate shocks. Descriptive statistics for the total sample and the four regions are reported in Table 4 and show a large variation within and between regions. We divide the potential answers for time use into five groups of activity: work on the household's farm (agricultural and non-agricultural work); work on other households' farms in agricultural activities; work on other households' farms in non-agricultural activities¹⁰; leisure time and other activities¹¹; and domestic chores and taking care of children and other members of the household. The traditional division of gender roles is sharp in these areas. While men are the households' main breadwinners, women's responsibilities are concentrated on domestic chores and taking care of the children. The percentage of time use for men and women is presented in Table 5. Males devote the bulk of their time to working on their land plot or on another household's land plot. Although females also spend some time working on agricultural activities, the difference is large. The percentage of time devoted to working on non-agricultural activities on other households' farms is small for both men and women, though men spend a higher proportion of their time employed as such. Women devote almost half of their day to domestic chores and taking care of children in the house, with little support from their husbands. Leisure time is similar for men and women.

The raw descriptive statistics suggest that in the presence of violent shocks in the rural district, both men and women spend more time working on the household farm. Men decrease their percentage of time for engagement in agricultural activities on other households' farms, and further reduce the time they devote to domestic chores and taking care of children; time devoted to leisure and other activities remains the same. Women are less able than men to adjust their time use. They increase their percentage of time working in non-agricultural activities outside their own farm, but this accounts for less than one-third of increased time. The remainder is adjusted by way of reduced leisure time.

We complement the analysis of time use with labour market questions. Male household members mostly lead participation in labour markets. As Table 6 shows, employment outside the farm and actively seeking a job is more frequent among men than women. Men have a similar attachment to the

Table 4. Descriptive statistics: instrumental variable

	Region				Total sample
	Atlantic	Central	Coffee-growing	Southern	
Presence of indigenous population, 1535–1540	0.253 (0.435)	1.000 (0.000)	0.496 (0.500)	0.134 (0.341)	0.465 (0.499)
N	1,262	1,027	1,963	1,039	5,291

Notes: Standard errors in parenthesis.

Source: ELCA: First wave, community questionnaire.

Table 5. Descriptive statistics: time use

	Female			Male			All		
	No violent shock	Violent shock	Difference between means (t-test)	No violent shock	Violent shock	Difference between means (t-test)	No violent shock	Violent shock	Difference between means (t-test)
Percentage of time working on the household farm	0.063 (0.131)	0.072 (0.144)		0.228 (0.267)	0.269 (0.293)	***	0.144 (0.225)	0.170 (0.250)	***
Percentage of time working on agricultural activities on other households' farms	0.013 (0.073)	0.017 (0.086)		0.249 (0.284)	0.226 (0.282)		0.129 (0.237)	0.120 (0.232)	
Percentage of time working on non-agricultural activities on other households' farm	0.014 (0.079)	0.018 (0.098)		0.047 (0.156)	0.042 (0.144)		0.030 (0.124)	0.030 (0.124)	
Percentage of leisure time and other activities	0.405 (0.165)	0.369 (0.171)	***	0.407 (0.155)	0.408 (0.164)		0.406 (0.160)	0.388 (0.169)	***
Percentage of time spent on domestic chores and taking care of children and other members of the household	0.505 (0.189)	0.523 (0.211)	*	0.069 (0.117)	0.056 (0.116)	**	0.291 (0.269)	0.292 (0.289)	
Number of observations	2173	518		2093	507		4266	1025	

Notes: Standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

Source: ELCA: First wave, household questionnaire.

Table 6. Descriptive statistics: formal labour markets

	Female			Male			All	
	No violent shock	Violent shock	Difference between means (t-test)	No violent shock	Violent shock	Difference between means (t-test)	No violent shock	Violent shock
Worked for a salary in the past 12 months (1 if he/she worked for a salary)	0.104 (0.305)	0.106 (0.308)		0.353 (0.478)	0.349 (0.477)		0.226 (0.418)	0.226 (0.419)
Tried to find a job in the past 12 months (1 if he/she tried to find a job)	0.061 (0.239)	0.068 (0.251)		0.237 (0.425)	0.296 (0.457)	***	0.147 (0.354)	0.180 (0.385)
Number of observations	2173	518		2093	507		4266	1.025

Notes: Standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

Source: ELCA: First wave, household questionnaire.

labour market, regardless of whether or not the household lives in a rural district affected by a violent shock. However, when the household lives in a rural district affected by a violent shock, women slightly increase their participation in formal labour markets. More women in households with shocks have worked for a wage and tried to find jobs within the past 12 months. Men in rural districts that have suffered violent shocks have tried to find a job, apparently with little success.

The descriptive statistics for aggregate consumption (reported in Table 3 in the Online Appendix) are difficult to interpret. The annual per capita consumption of households living in regions affected by a shock is 4.4 per cent higher than for households living in unaffected regions. As armed groups attack wealthier households (Engel & Ibáñez, 2007), an Ordinary Least Squares (OLS) regression of consumption on the violent shock and the set of controls would suggest that violent shocks actually increase consumption. Therefore, comparing consumption before controlling for household characteristics and instrumenting a particular shock leads to incorrect conclusions regarding the shock's impact.

The descriptive statistics of the other control variables used in the estimations, discriminating by shock status, are also presented in Table B3 in the Online Appendix. Rural districts affected by violent shocks have a more peaceful past, are located at a higher altitude, and soil erosion is higher. Households in a rural district affected by a violent shock are also different from unaffected households in two main respects: they have a higher and more visible income-generating potential, both in the labour market and in farm production, and they are more vulnerable.

Households in regions affected by covariate shocks display a negative wealth index, while households in unaffected regions have a positive value. We believe that an actual violent shock negatively affects a household's possession of durable goods. Households in districts affected by a violent shock have less female headship, more children under five years of age, and more members of 65 or older. During the previous year, these households faced fewer dry months and more rainy months.

4. Results

To instrument violent shocks we use a dummy variable for presence of the native population during colonial times (between 1535 and 1540), because the likelihood of a rural district being hit by a violent shock is correlated with the path dependence of armed conflict. Even though violent shocks may be purposely directed, there exists a sizeable part of the variation in the prevalence of shocks that is exogenous to the household decision problem, which may be captured by this variable. However, the presence of native populations during colonial times is unaffected by household characteristics, which in turn determine time use and formal labour market attachment.

Table 7 presents the first stage of the regressions of the effect of the violent shock on time use and formal labour market participation. The instrument is relevant since it is highly individually significant; we obtain high values for the F test of joint significance (above 12 in all cases) and do not

Table 7. First-stage regressions for time use: formal labour markets (dependent variable: covariate violent shock)

	Both		Female		Male	
Presence of indigenous population, 1535–1540	–0.2405*** (0.0686)	–0.2444*** (0.0643)	–0.2379*** (0.0685)	–0.2444*** (0.0649)	–0.2427*** (0.0693)	–0.2443*** (0.0645)
Constant	0.3477* (0.2099)	0.7642* (0.4286)	0.3334 (0.2116)	0.7377* (0.4314)	0.3659* (0.2106)	0.7954* (0.4280)
Observations	5,291	5,291	2,691	2,691	2,600	2,600
R-squared	0.1310	0.1426	0.1255	0.1372	0.1394	0.1511
F-test excluded instruments	12.28	14.44	12.06	14.20	12.26	14.36
Regional fixed effects	No	Yes	No	Yes	No	Yes

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by community. All controls in Table 9 included. Source: ELCA: First wave, household questionnaire, Instituto Geográfico Agustín Codazzi (IGAC), and Fernández (2012).

encounter a weak instrument problem. The coefficient estimate for the instrumental variable has the expected signs: the presence of indigenous populations is negatively correlated with the probability that a rural district is affected by a covariate shock.

Table 8 presents the OLS and Instrumental Variable Estimation (IV) results for the effect of a violent shock on the time use of a household head and spouse. The OLS estimates suggest that the violent shock has no effect on time use. However, when we instrument we find that households decrease the percentage of time spent working on agricultural activities in other households' farms, increase the percentage of time spent working in non-agricultural activities in other households' farms (this effect is only marginally significant), and increase the time spent on domestic chores and taking care of children and other household members. An increase of one standard deviation on the incidence probability of a conflict shock decreases the percentage of time spent working on agricultural activities at other households' farms by 0.15 standard deviations, while the time spent on non-agricultural activities off the farm increases by 0.08 standard deviations, and time dedicated to household chores and caring for family members increases by 0.10 standard deviations. This implies that households in rural Colombia use labour markets when confronted by a violent shock, shifting the time worked off-farm from agricultural to non-agricultural activities. We also estimate the regressions excluding murder from covariate shocks, and we also repeat the estimation using a continuous definition of the violent shock. The results are robust and we report only the results for the covariate shock, henceforth including murders and the dichotomous definition of the shock.¹²

These results for the total population hide interesting differences between men and women. Table 9 shows that the time use of both men and women changes substantially, but in different directions: the women further specialise in household production while men increase their participation in non-agricultural activities. For women, we find that the violent shock induces a decrease in the time devoted to leisure and an increase in the time spent on household chores and caring for family members. The two effects have a similar size: an increase in one standard deviation in the probability of a covariate shock generates a decrease of 0.16 standard deviations in leisure time, and an increase of 0.16 standard deviations in household chores and care activities. In response to violent shocks, men substantially reduce the time spent on agricultural activities at other households' farms (0.22 standard deviations for an increase of one standard deviation in the incidence probability), and increase off-farm non-agricultural work (0.13 standard deviations for an increase of one standard deviation in the incidence probability). The reduction in time dedicated to off-farm agricultural work is bigger than the increase in off-farm non-agricultural activities. This asymmetric change may be because labour markets are unable to absorb increased supply fully, or because the lower increase in non-agricultural activities is sufficient to compensate for reductions in agricultural activities off-farm.

Two potential mechanisms may drive these impacts on time use. First, covariate conflict shocks induce households to reduce time spent on agricultural activities – presumably due to contractions in agricultural production – and pushes men to compensate for losses by supplying their labour to off-farm non-agricultural activities. Arias and Ibáñez (2012) estimate the impact of conflict on agricultural production: the presence of non-state armed actors and covariate conflict shocks induce households to substitute more profitable crops (permanent) for less risky, but less profitable, productive activities (seasonal crops and livestock). In addition, the percentage of idle land is higher due to conflict and households' reduced investment. Second, households may decide to retreat into the safety of their land plots. By participating less in labour markets outside their land plot, the risk of violence is lower. This may explain why women dedicate more time to household chores or taking care of their children, who may also go to school less frequently in order to avoid victimisation. Both interpretations are possible and are not mutually exclusive.

Figure 1 displays the months during which people in rural districts go out looking for a job. There is a clear seasonality that might be driven by the cycle of agricultural production. A higher percentage of people in rural districts affected by violent shocks go out looking for a job on a monthly basis compared with people in unaffected districts. It could well be the case that men seek jobs outside their land plots in non-agricultural activities, while women confine themselves to their land plots.

Table 8. Second-stage regressions for time use: household heads and spouses

	Percentage of time working on the household farm			Percentage of time working on agricultural activities on other households' farms			Percentage of time working on non-agricultural activities on other households' farms		
	Percentage of time working on the household farm			Percentage of time working on agricultural activities on other households' farms			Percentage of time working on non-agricultural activities on other households' farms		
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS
Violent shock	0.0106 (0.0154)	-0.0419 (0.0463)	0.0280 (0.0469)	-0.0043 (0.0113)	-0.0136* (0.0077)	-0.0841 (0.0539)	-0.0006 (0.0052)	0.0387 (0.0259)	0.0493* (0.0269)
Constant	0.0234 (0.0460)	-0.0930** (0.0436)	-0.0971* (0.0524)	0.0646 (0.0395)	0.1662*** (0.0370)	0.0995** (0.0451)	0.0051 (0.0198)	-0.0121 (0.0258)	-0.0380 (0.0324)
Observations	5291	5291	5291	5291	5291	5291	5291	5291	5291
R-squared	0.1192	0.1395	0.1393	0.1132	0.1294	0.0968	0.0393	0.0250	0.0185
Estimated effect of a standard increase in probability of violent shock (in standard deviations of dependent variable)		-0.0261	0.0257			-0.0509	0.0402	0.0447	0.0837
Regional fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No
									Yes

	Percentage of leisure time and other activities			Percentage of time spent on domestic chores and taking care of children and other members of the household		
	Percentage of leisure time and other activities			Percentage of time spent on domestic chores and taking care of children and other members of the household		
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Violent shock	-0.0163 (0.0099)	-0.0165* (0.0093)	-0.0333 (0.0374)	-0.0355 (0.0357)	0.0106 (0.0081)	0.1205*** (0.0392)
Constant	0.4864*** (0.0352)	0.4499*** (0.0423)	0.4938*** (0.0413)	0.4606*** (0.0509)	0.4204*** (0.0319)	0.3724*** (0.0424)
Observations	5291	5291	5291	5291	5291	5291
R-squared	0.1190	0.1233	0.1175	0.1213	0.0510	0.0278
Estimated effect of a standard deviation increase in probability of violent shock (in standard deviations of dependent variable)			-0.0294	-0.0463		0.0632
Regional fixed effects	No	Yes	No	Yes	No	No
					Yes	Yes
						0.0957

Notes: ***p<0.01, **p<0.05, *p<0.1. Standard errors clustered by community. All controls in Table 9 included.

Source: ELCA: First wave, household questionnaire.

Table 9. Second-stage regressions of time use: females and males

	Percentage of time working on the household farm			Percentage of time working on agricultural activities on other households' farms			Percentage of time working on non-agricultural activities on other households' farms			Percentage of leisure time and other activities			Percentage of time spent on domestic chores and taking care of children and other members of the household			
	2SLS		OLS	2SLS		OLS	2SLS		OLS	2SLS		OLS	2SLS		OLS	2SLS
	OLS	2SLS		OLS	2SLS		OLS	2SLS		OLS	2SLS		OLS	2SLS		2SLS
I																
Female																
Violent shock	0.0114 (0.0069)	-0.0176 (0.0290)	0.0031 (0.0043)	-0.0131 (0.0158)	0.0086 (0.0184)	0.0045 (0.0045)	-0.0322*** (0.0106)	-0.1274** (0.0504)	0.0133 (0.0103)	0.1496*** (0.0516)						
Constant	-0.0265 (0.0286)	-0.0106 (0.0346)	0.0416* (0.0224)	0.0505** (0.0215)	-0.0027 (0.0272)	-0.0004 (0.0228)	0.4500*** (0.0459)	0.5019*** (0.0641)	0.5353*** (0.0434)	0.4609*** (0.0617)						
Observations	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691						
R-squared	0.1559	0.1492	0.0293	0.0229	0.0392	0.0396	0.1226	0.0764	0.1187	0.0490						
Estimated effect of a standard deviation increase in probability of violent shock (in standard deviations of dependent variable)		-0.0274		-0.0359	0.0215			-0.159		0.160						
II																
Male																
Violent shock	0.0368* (0.0197)	0.1081 (0.0876)	-0.0272* (0.0148)	-0.2893*** (0.1076)	0.0947** (0.0447)	-0.0021 (0.0087)	-0.0024 (0.0098)	0.0495 (0.0423)	-0.0050 (0.0065)	0.0369 (0.0328)						
Constant	-0.0134 (0.0771)	-0.0549 (0.0964)	0.5062*** (0.0678)	0.6586*** (0.1020)	-0.0420 (0.0521)	0.0143 (0.0355)	0.4587*** (0.0494)	0.4285*** (0.0563)	0.0342 (0.0300)	0.0098 (0.0358)						
Observations	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600						
R-squared	0.2196	0.2100	0.3264	0.2069	0.0183	0.0739	0.1897	0.1744	0.1133	0.0953						
Estimated effect of a standard deviation increase in probability of violent shock (in standard deviations of dependent variable)		0.0858		-0.220	0.133			0.0682		0.0683						

Notes: ***p<0.01, **p<0.05, *p<0.1. Standard errors clustered by community. Regional fixed effects included. All controls in Table 9 included.
Source: ELCA: First wave, household questionnaire.

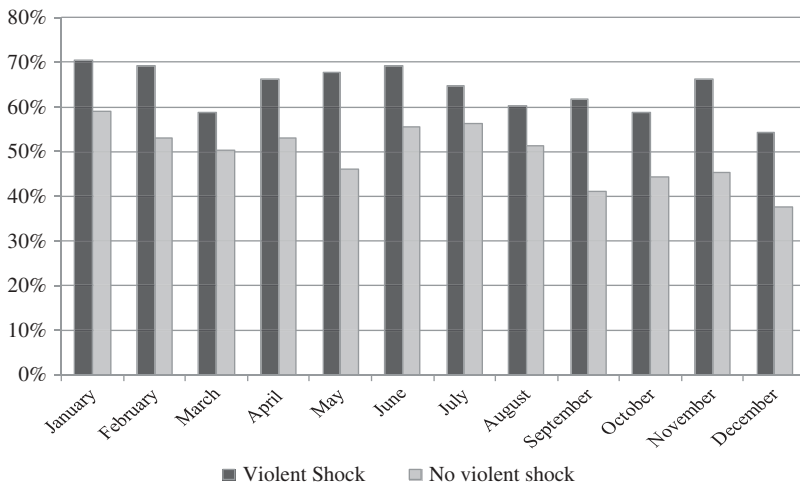


Figure 1. Months during which people supplied off-farm work (percentage of the rural district).
Source: ELCA: First wave, community questionnaire.

Households may also decide to supply labour to formal labour markets. If this is the case then labour markets may play an important role in protecting households against facing large welfare losses. Table 10 reports the results for the OLS and IV estimates of the effects of violent shocks on having worked for salaried employment and trying to find a job during the past year. Violent shocks reduce the probability of working for a salary during the last 12 months. However, when we estimate the results separately for men and women, the coefficients are not statistically significant. Some of the effects, such as the IV estimate of the increase in people reporting to have worked for a salary in the past 12 months, are sizeable, but because the standard errors are large the effect is not significant. Violent shocks do not appear to translate into increases in the percentage of households whose members tried to find a job in the past 12 months. These facts may signal the inability of markets to fully absorb the additional labour supply or the decision of households not to seek formal jobs. We also estimated the effect of the violent shock on men and women separately (not shown), and again find no effect on salaried employment or individuals searching for a job.

In order to explore further the potential mechanisms driving changes in time use, we estimate heterogeneous impacts by whether land ownership is formal or not and by size of the land plot (Tables B4 and B5 in the Online Appendix). For estimating the impact by land size, we divide households into those that are above or below the median of the standardised plot size. We find informal and small landowners adjust more to conflict shocks. Men from households with informal land ownership or small land plots reduce the time spent on agricultural activities off-farm, while increasing time spent on non-agricultural activities off-farm. Women from these households dedicate more time to non-agricultural activities off-farm and household chores, and spend less time on leisure activities. These women also try to find a job as a response to the conflict shock, albeit unsuccessfully. Presumably, these households suffer from a contraction in household income caused by conflict and seek to compensate for these losses by using labour markets. The findings for households with formal land ownership and large plots signal to a smaller extent the impact of the conflict shock and a decision to retreat to their land plots. Women from these households reduce the time spent on leisure and dedicate more time to household chores. Men from formal land plots do not respond to conflict shocks, whereas men with large land plots cut back the time spent working off-farm on agricultural activities. Larger land plots or those with formal legal titles signal wealthier households that may prefer to retreat into their land plots in order to avoid being targeted by armed groups.

Our results suggest that households in Colombian rural areas use labour markets as a strategy for coping with conflict shocks. We now turn to examining whether an expansion in the labour supply is

effective in preventing conflict shocks through reductions in consumption. Table 11 shows the OLS and IV coefficient estimates for aggregate consumption. Our results show that consumption decreases, and hence households are not able to fully insure against the covariate conflict shock. Once we control for percentage of time dedicated to working on-farm and off-farm for men and women separately, the coefficient estimate for the violent shock decreases in magnitude and is not statistically significant. This may indicate that labour markets help households cope with violent shocks.

When labour markets do not break down as a consequence of conflict they may absorb the additional pressure generated by an increase in time devoted to off-farm non-agricultural activities.

Table 11. First and second stage regressions consumption

	Log consumption expenditure	Log consumption expenditure
First stage		
Presence of indigenous population, 1535–1540	–0.1900*** (0.0297)	–0.1978*** (0.0309)
F-test excluded instruments	40.86	40.82
Second stage		
Violent shock	–0.1071* (0.0557)	–0.0408 (0.0456)
Age	–0.0082* (0.0043)	–0.0110*** (0.0041)
Age squared	0.0001 (0.0001)	0.0001* (0.0001)
Education (years)	0.0584*** (0.0067)	0.0573*** (0.0068)
Dummy: female household head (1 household head is a female, 0 otherwise)	–0.0702*** (0.0207)	–0.0185 (0.0327)
Number of children under 5 years of age	–0.1284*** (0.0107)	–0.1319*** (0.0098)
Number of children between 5 and 18 years of age	–0.1429*** (0.0134)	–0.1438*** (0.0128)
Number of members 65 or older	–0.0707*** (0.0107)	–0.0694*** (0.0120)
Number of members of extended family	–0.0470*** (0.0097)	–0.0452*** (0.0092)
Dummy: participation in government programme <i>Familias in Acción</i> (1 if has access to the programme, 0 otherwise)	–0.0965*** (0.0185)	–0.0977*** (0.0199)
Dummy: wealth index quintile 2	0.0901*** (0.0346)	0.0874*** (0.0332)
Dummy: wealth index quintile 3	0.1898*** (0.0392)	0.1875*** (0.0378)
Dummy: wealth index quintile 4	0.2494*** (0.0276)	0.2446*** (0.0250)
Dummy: wealth index quintile 5	0.4142*** (0.0333)	0.4063*** (0.0290)
Plot size (standardised by region)	0.0026 (0.0023)	0.0023 (0.0020)
Plot size at household creation (standardised by region)	0.0181** (0.0082)	0.0169* (0.0091)
Dummy: problems with production due to the quality of the land (1 if there were problems in the community, 0 otherwise)	–0.0189 (0.0484)	–0.0164 (0.0445)
Livestock income as share of total agricultural income	–0.0037 (0.0350)	0.0133 (0.0340)
Daily wage	0.0000 (0.0000)	0.0000 (0.0000)

(continued)

Table 11. (*Continued*)

	Log consumption expenditure	Log consumption expenditure
Percentage of time working on the household farm (female)		0.1539* (0.0815)
Percentage of time working on the household farm (male)		0.1902*** (0.0484)
Percentage of time working on other households' farms (female)		-0.0647 (0.0881)
Percentage of time working on other households' farms (male)		0.1067** (0.0524)
Constant	14.3448*** (0.0716)	14.2935*** (0.0735)
Observations	2,964	2,964
R-squared	0.3467	0.3593
Average consumption	1,577,846	1,577,846
S.D. average consumption	944,662	944,662

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by community. Regional fixed effects included.
Source: ELCA: First wave, household questionnaire.

This may be a feasible strategy for protecting the household and avoiding the adoption of costly strategies. The size of the decrease in off-farm agricultural activities by men is bigger than the size of the increase in off-farm non-agricultural activities. Thus, additional labour contributes to mitigating conflict shocks and suggests that labour markets provide an alternative for households, even during conflict periods. Apparently, this additional labour supply is not being absorbed by formal labour markets but by subsistence activities. The increase in the time women dedicate to household chores and caring for family members may signal a retreat by some family members to their land plot. Women and children may reduce time spent outside their land plot to avoid interactions with non-state armed actors and reduce the risk of aggression.

5. Conclusions

This paper studied the use of labour markets for mitigating covariate violent shocks. We instrument the covariate violent shock with a dummy variable for the presence of native populations during colonial times (1535–1540); the likelihood of an incidence of a violent shock is indeed lower in regions that had a native population presence during colonial times. The impact of violent shocks appears to be pushing them to change their time use, substituting off-farm agricultural work for off-farm non-agricultural work and increasing time devoted to household chores and caring for children and other family members. The redistribution of time exhibits a stark gender differentiation. Men decrease the time devoted to off-farm agricultural activities and increase the off-farm non-agricultural activities; women decrease their leisure time and increase the time devoted to household chores and childcare. These changes in time use suggest a potential reduction in agricultural production, or the decision of households to retreat into their land plots to prevent victimisation. Nonetheless, there are no significant changes for either men or women regarding salaried work or looking for a job. Conflict shocks have a negative impact on consumption, suggesting that the redistribution of time partially responds to a reduction in household income. The substitution of on-farm to off-farm labour in non-agricultural activities seems effective in counteracting the negative impact of conflict shocks.

The results are presumably contingent on some particular characteristics of the Colombian conflict. Because the Colombian conflict is of a medium intensity, markets have not broken down and have adjusted to conflict. In this case, markets may provide an alternative for mitigating the impact of conflict

shock. The results of this paper are relevant to conflicts with similar characteristics, such as the Naxalite conflict in India and the previous conflict in the southern Philippines. In high-intensity conflicts, intense violence against the population and large-scale destruction may severely affect markets. Labour demand may contract significantly along with supply, as households retreat to their land plots and produce subsistence crops (Brück, 2004a). However, during post-conflict periods, labour markets may play an important role in boosting the rapid recovery of households affected by conflict, regardless of the type of conflict endured. Our paper provides some important evidence in this respect.

This paper finds that changing the labour supply is an additional alternative for mitigating violent shocks. Post-conflict policies have concentrated on designing short-term relief programmes aimed at preventing households from falling below subsistence consumption levels. Programmes aimed at boosting productive activities and creating labour markets are generally postponed until a sustainable path to peace is achieved. However, households are resilient, production continues in the midst of conflict, and labour markets (those entailing subsistence activities) persist. After the war ends, countries, usually supported by the international community, invest large sums to reconstruct public infrastructure and provide additional public goods. Such investment programmes could contain special provisions that request the inclusion of local labourers in these projects, as is usual in workfare programmes. This could provide an initial start-up for local labour markets, fuelling cash in the economy.

Since workfare programmes are a short-term strategy, policies to increase local production in the regions affected by conflict are important for ensuring sustainable labour demand. Protecting productive activities not affected by war and promoting the rapid recovery of agricultural production may help households cope with conflict shocks and initiate a recovery once the conflict ends. Non-agricultural activities can provide additional income for households and diversify income sources. Therefore, labour-training programmes for the creation of skills beyond agricultural production can play an important role. Additionally, programmes such as credits for small producers, the transference of technology, and instruments for risk management should be provided to rapidly boost agricultural production.

These policies should be complemented by short-relief programmes, since adjusting the labour supply is not alone able to fully counter the impact of conflict shocks. Given that our results suggest that women devote more time to housework and childcare after a violent shock, governments should reach households of conflict-afflicted regions with a rich supply of social programmes, such as conditional cash transfers and childcare alternatives such as community nurseries, or strengthen grassroots initiatives in order to share the burden of household chores and childcare.

As discussed earlier, Colombia's conflict has been ongoing for 50 years. This implies that there are numerous variables – not included in our data set and hence unobservable – that may affect household behaviour and the ways in which households insure against shocks that we are unable to control for. Because conflict is not new to these households, the results presented in this paper constitute the lower bound of the ways in which households use the labour market to insure against violent shocks.

Acknowledgements

We gratefully acknowledge funding from the World Bank, as well as generous funding from the Government of Norway. Two anonymous referees, Kristin Bergtora Sandvick, Patricia Justino, Nidhiya Menon, Eleonora Nillesen, Yana Rodgers, Philip Verwimp, and participants in the PRIO, World Bank, and AL CAPONE workshops provided valuable comments for the improvement of this paper. Any remaining mistakes in the paper are the authors' own.

Notes

1. Rural districts in Colombia are smaller administrative divisions within municipalities.
2. The Online Appendix briefly describes the history of the current Colombian conflict.

3. The rural districts are divided as follows: 57 in the Atlantic, 48 in the Central, 58 in the Coffee-growing, and 59 in the Southern Regions.
4. These are the survey's projected numbers. However, because of oversampling, the actual sample sizes presented in the tables may differ slightly from these numbers.
5. Previous research shows that forcibly displaced households worked mostly in the agricultural sector (57.3%) or were dedicated to household chores (12.8%). In addition, 55.5 per cent had access to land and worked on the farm. Illegal land seizure by armed groups was large: land abandoned or illegally seized by armed groups amounts to six million hectares (Ibáñez, 2008)).
6. We define extended family as any family member other than the head of household, spouse, and the couple's offspring.
7. Durable goods include refrigerators, laundry machines, blenders, microwave ovens, ovens, water heaters, air conditioners, televisions, radios, internet access, computers, bicycles, cars, and other properties (inclusive of housing). The index was calculated using the methodology of principal components.
8. The victimisation profile of forcibly displaced persons diverges significantly from the reports of idiosyncratic shocks directed at 'stayers'. Ibáñez (2008) shows that rural households forced to flee report a high incidence of direct victimisation: 54.5 per cent of households were directly threatened, 34.5 per cent experienced the killing of a household member, and 17.3 per cent had a household member forcefully recruited by armed groups.
9. Our definition of covariate conflict shocks includes events related to conflict – such as kidnapping, extortions, and threat from armed groups – and others, such as murders, which are also akin to crime. However, our results are robust to excluding murder from covariate shocks.
10. The survey directly asked respondents about the time they dedicated to 'non-agricultural activities in their own farm' and 'non-agricultural activities in other farms'.
11. Leisure and recreation, personal care, helping other households, social community activities, education, looking for a job, and travelling to the workplace.
12. These results are available upon request.

References

- Akresh, R., Verwimp, P., & Bundervoet, T. (2011). Civil war, crop failure and stunting in Rwanda. *Economic Development and Cultural Change*, 59, 777–810.
- Arias, M. A., & Ibáñez, A. M. (2012). *Conflicto armado y producción agrícola: ¿Aprenden los pequeños productores a vivir en medio del conflicto?* [Armed Conflict and Agricultural Production: Do Small Producers Learn to Live Amid Conflict?] Documento CEDE 2012-44. Bogotá: Department of Economics, Universidad de los Andes.
- Barret, C., & Carter, M. (2006). The economics of poverty traps and persistent poverty: An asset based approach. *Journal of Development Studies*, 42, 178–199.
- Behrman, J. (1988). Intrahousehold allocation of nutrients in rural India: Are boys favoured? Do parents exhibit inequality aversion? *Oxford Economic Papers*, 40, 32–54.
- Brück, T. (2004a). *Coping strategies in post-war rural Mozambique*. Households in Conflict Network (<http://www.hicn.org/>).
- Brück, T. (2004b). *The welfare effects of farm household activity choices in post-war Mozambique*. German Institute for Economic Research: Berlin
- Bundervoet, T., Verwimp, P., & Akresh, R. (2009). Health and civil war in rural Burundi. *Journal of Human Resources*, 44, 536–563.
- Calderón, V., & Ibáñez, A. M. (2009). *Labour market effects of migration-related supply shocks: Evidence from internal refugees in Colombia*. Institute of Development Studies, Sussex, United Kingdom.
- Camacho, A. (2008). Stress and birth weight: Evidence from terrorist attacks. *The American Economic Review*, 98, 511–515.
- Cameron, L. A., & Worswick, C. (2003). The labour market as a smoothing device: Labour supply responses to crop loss. *Review of Development Economics*, 7, 327–341.
- Engel, S., & Ibáñez, A. M. (2007). Displacement due to violence in Colombia: A household level analysis. *Economic Development and Cultural Change*, 55, 335–365.
- Fernández, M. (2012). Violencia y derechos de propiedad: El caso de la violencia en Colombia [Violence and Property Rights: A Case Study for Colombia]. *Ensayos sobre Política Económica*, 30, 113–147.
- Ibáñez, A. M. (2008). *El Desplazamiento Forzoso en Colombia: Un Camino Sin Retorno Hacia la Pobreza* [Forced Displacement in Colombia: A Road to Poverty without Return]. Bogotá: Ediciones Uniandes.
- Ibáñez, A. M., & Moya, A. (2010). Vulnerability of victims of civil conflict: Empirical evidence for the displaced population in Colombia. *World Development*, 38, 647–663.
- Ito, T., & Kurosaki, T. (2009). Weather risk and the off-farm labour supply of agricultural households in India. *American Journal of Agricultural Economics*, 91, 697–710.
- Jacoby, H. G., & Skoufias, E. (1997). Risk, financial markets, and human capital in a developing country. *Review of Economic Studies*, 64, 311–335.
- Jensen, R. (2000). Agricultural volatility and investments in children. *The American Economic Review*, 90, 399–404.
- Justino, P. (2009). Poverty and violent conflict: A micro-level perspective on the causes and duration of warfare. *Journal of Peace Research*, 46, 315–333.

- Justino, P., & Verwimp, P. (2006). *Poverty dynamics, violent conflict and convergence in Rwanda*. Households in Conflict Network (<http://www.hicn.org/>).
- Kochar, A. (1999). Smoothing consumption by smoothing income: Hours-of-work responses to idiosyncratic agricultural shocks in rural India. *Review of Economics and Statistics*, 81, 50–61.
- Kondylis, F. (2010). Conflict displacement and labour market outcomes in post-war Bosnia and Hersegovina. *Journal of Development Economics*, 93, 235–248.
- Menon, N., & Rodgers, Y. v. d. M. (2011). *War and women's work: Evidence from conflict in Nepal*. IZA Discussion Papers 6209, Institute for the Study of Labour (IZA) (http://www.iza.org/en/webcontent/index_html).
- Rose, E. (2001). Ex-ante and ex-post labour supply response to risk in a low-income area. *Journal of Development Economics*, 64, 371–388.
- Shemyakina, O. (2006). *The effect of armed conflict on accumulation of schooling: Results from Tajikistan*. Households in Conflict Network (<http://www.hicn.org/>).
- Stewart, F., & Fitzgerald, V. (2001). *The economic and social consequences of conflict. War and underdevelopment*. Oxford: Oxford University Press.