**Online Appendix**

*Full Tables (including primary controls)*

Table 1. Agricultural income and conflict with the FARC and ELN in Colombia

|  | (1) | (2)  FARC Conflict events (UCDP) | (3) | (4) | (5) | (6)  FARC Conflict events (CEDE) | (7) | (8) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FARC Conflict incidence (UCDP) | ELN Conflict incidence (UCDP) | ELN Conflict events (UCDP) | FARC Conflict incidence (CEDE) | ELN Conflict incidence (CEDE) | ELN Conflict events (CEDE) |
|  |
|  |  |  |  |  |  |  |  |  |
| Coffee income | -0.07\*\* | -0.18\*\* | -0.02 | -0.03 | -0.13\*\* | -1.03\* | -0.06 | -0.21 |
|  | (0.03) | (0.09) | (0.02) | (0.03) | (0.05) | (0.54) | (0.04) | (0.17) |
| Population | -0.01 | 0.02 | -0.01 | -0.03 | -0.14 | 0.19 | -0.06 | -0.20 |
|  | (0.03) | (0.07) | (0.02) | (0.03) | (0.10) | (0.74) | (0.05) | (0.16) |
| Coca | 0.00\*\* | 0.00\*\* | 0.00\*\* | 0.00\*\* | 0.00\*\* | 0.00\*\* | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |  |  |  |  |
| Observations | 16,252 | 16,252 | 16,252 | 16,252 | 12,422 | 12,422 | 12,422 | 12,422 |
| Number of units | 956 | 956 | 956 | 956 | 956 | 956 | 956 | 956 |
| Temporal coverage | 1989-2005 | 1989-2005 | 1989-2005 | 1989-2005 | 1993-2005 | 1993-2005 | 1993-2005 | 1993-2005 |
|  |  |  |  |  |  |  |  |  |
| First-Stage Diagnostics | | | |  |  |  |  |  |
| KP F-Statistic | 19.18 | 19.18 | 19.18 | 19.18 | 27.30 | 27.30 | 27.30 | 27.30 |
| KP LM-Statistic (P) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| Hansen J-Statistic (P) | 0.86 | 0.78 | 0.55 | 0.87 | 0.78 | 0.78 | 0.18 | 0.30 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

Table 4. Agricultural income and mechanism variables

|  | (9) | (10)  Government spending | (11) | (12) | (13) |
| --- | --- | --- | --- | --- | --- |
|  | Tax base | Education transfers | Health transfers | Inequality (infant mortality) |
|  |
|  |  |  |  |  |  |
| Coffee income | 0.09 | 0.48\*\* | 0.78\*\*\* | 0.74\*\*\* | 69.23\*\* |
|  | (0.12) | (0.20) | (0.23) | (0.26) | (33.60) |
| Population | 0.40 | -0.78\*\* | 1.24\*\*\* | 0.65\*\*\* | -13.04 |
|  | (0.29) | (0.35) | (0.36) | (0.19) | (9.39) |
| Coca | 0.00 | -0.00 | -0.00 | -0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |  |
| Observations | 15,104 | 15,104 | 10,118 | 10,118 | 15,085 |
| Number of units | 944 | 944 | 944 | 944 | 944 |
| Temporal coverage | 1988-2003 | 1988-2003 | 2000-2010 | 2000-2010 | 1998-2013 |
|  |  |  |  |  |  |
| First-Stage Diagnostics |  |  |  |  |  |
| KP F-Statistic | 18.76 | 18.76 | 15.65 | 15.65 | 9.63 |
| KP LM-Statistic (P) | 0.05 | 0.05 | 0.04 | 0.04 | 0.00 |
| Hansen J-Statistic (P) | 0.44 | 0.16 | 0.15 | 0.12 | 0.76 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Key variable summary statistics*

Table A0. Key variable summary statistics

| Variable | Observations | Mean | Std. Dev. | Min | Max |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| Conflict incidence (UCDP) | 30,888 | 0.06 | 0.24 | 0.00 | 1.00 |
| Conflict events (UCDP) | 30,888 | 0.11 | 0.61 | 0.00 | 22.00 |
| Conflict incidence (CERAC) | 17,820 | 0.22 | 0.41 | 0.00 | 1.00 |
| Guerrilla attacks (CERAC) | 17,820 | 0.49 | 1.50 | 0.00 | 41.00 |
| Conflict incidence (CEDE) | 17,641 | 0.29 | 0.45 | 0.00 | 1.00 |
| Guerrilla attacks (CEDE) | 17,641 | 1.04 | 3.42 | 0.00 | 74.00 |
| Log population, millions | 17,820 | -4.36 | 0.96 | -8.83 | -1.36 |
| Coca | 28,512 | 0.11 | 0.32 | 0.00 | 1.00 |
| Coffee intensity | 28,159 | 0.83 | 1.54 | 0.00 | 10.59 |
| Log internal coffee price | 31,878 | 10.31 | 0.26 | 9.84 | 10.82 |
| Log coffee production of top three producing countries,  (# of 60kg bags) | 31,878 | 17.52 | 0.34 | 16.91 | 18.06 |
| Water availability index | 30,267 | 3,324,325 | 549,822 | 0.00 | 5,625,773 |
| Soil erosion index | 30,267 | 1.92 | 1.06 | 0.00 | 5 |
| Temperature | 28,710 | 21.36 | 4.96 | 3.90 | 28.90 |
| Log local government spending, constant 1993 Pesos | 31,230 | 5.35 | 1.77 | 0.00 | 13.12 |
| Log education transfers | 11,749 | 9.89 | 1.66 | 0.00 | 17.97 |
| Log health transfers | 11,749 | 10.95 | 1.45 | 0.00 | 18.85 |
| Log tax revenues, constant 1993 Pesos | 31,263 | 3.08 | 1.78 | 0.00 | 12.56 |
| Inequality (infant mortality) | 19,710 | 69.65 | 74.72 | 0.00 | 2513.27 |

*Agricultural income and infant mortality*

While the interaction of infant mortality and local tax income is positive and significant in Table 2, tax income (Model 10) is not significant by itself. Model A1 below checks to see whether infant mortality is driving this relationship by itself. Again, this does not appear to be the case.

Table A1. Agricultural income and infant mortality

|  | (A1) |
| --- | --- |
|  | Infant mortality |
|  |
|  |  |
| Coffee income | -12.76 |
|  | (13.81) |
| Population | -5.37 |
|  | (3.58) |
| Coca | 0.00 |
|  | (0.00) |
|  |  |
| Observations | 15,230 |
| Number of units | 955 |
| Temporal coverage | 1998-2013 |
|  |  |
| First-Stage Diagnostics | |
| KP F-Statistic | 9.75 |
| KP LM-Statistic (P) | 0.00 |
| Hansen J-Statistic (P) | 0.10 |

*Paramilitary presence*

It is possible that paramilitary presence may encourage guerrillas to engage in attacks in order to remove these groups from the area. At the same time, paramilitary presence may affect agricultural GDP by enforcing conversion of land to coca or otherwise attacking farmers believed to be collaborating with the guerrillas. To ensure that this is not affecting the results presented in Table 1, a dummy indicator of paramilitary activity (United Self-Defences of Colombia attacks in the municipality-year) was added to Models 1-8 as an additional control.

This variable was adapted from the Panel Conflicto y Violencia of the Panel Municipal del CEDE. Results do not differ significantly from those presented in Table 1.

Table A2. Controlling for paramilitary presence

|  | (A2) | (A3)  FARC Conflict events (UCDP) | (A4) | (A5) | (A6) | (A7)  FARC Conflict events (CEDE) | (A8) | (A9) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FARC Conflict incidence (UCDP) | ELN Conflict incidence (UCDP) | ELN Conflict events (UCDP) | FARC Conflict incidence (CEDE) | ELN Conflict incidence (CEDE) | ELN Conflict events (CEDE) |
|  |
|  |  |  |  |  |  |  |  |  |
| Coffee income | -0.10\*\* | -0.24\*\* | -0.02 | -0.04 | -0.11\*\* | -0.94\* | -0.06 | -0.20 |
|  | (0.04) | (0.10) | (0.02) | (0.03) | (0.05) | (0.54) | (0.04) | (0.18) |
| Population | -0.01 | 0.01 | -0.03 | -0.06\* | -0.15 | 0.12 | -0.06 | -0.21 |
|  | (0.04) | (0.09) | (0.02) | (0.03) | (0.10) | (0.74) | (0.06) | (0.16) |
| Coca | 0.00\*\*\* | 0.00\*\* | 0.00\*\* | 0.00\*\* | 0.00 | 0.00\*\* | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| AUC presence | 0.03 | 0.03 | -0.00 | -0.02 | 0.16\*\*\* | 0.96\*\*\* | 0.05\*\*\* | 0.10 |
|  | (0.02) | (0.05) | (0.01) | (0.02) | (0.03) | (0.20) | (0.02) | (0.16) |
|  |  |  |  |  |  |  |  |  |
| Observations | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 |
| Number of units | 956 | 956 | 956 | 956 | 956 | 956 | 956 | 956 |
| Temporal coverage | 1993-2005 | 1993-2005 | 1993-2005 | 1993-2005 | 1993-2005 | 1993-2005 | 1993-2005 | 1993-2005 |
|  |  |  |  |  |  |  |  |  |
| First-Stage Diagnostics | | | |  |  |  |  |  |
| KP F-Statistic | 25.76 | 25.76 | 25.76 | 25.76 | 25.76 | 25.76 | 25.76 | 25.76 |
| KP LM-Statistic (P) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| Hansen J-Statistic (P) | 0.77 | 0.95 | 0.49 | 0.72 | 0.54 | 0.79 | 0.16 | 0.24 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Time period extension*

For comparability with the previous country-level study (Dube and Vargas, 2013), the primary models (1-8) were restricted to the same end date. However, data from UCDP and CEDE does extend beyond this date – up to 2013 and 2008 respectively. To confirm that the results presented in Table 1 are not the result of the specific time-period restriction, models 1-8 were repeated with extended temporal coverage.

Statistical significance is maintained in models A14-15. However, some significance is lost in A10 and A11. A12 is also positive and significant, if only at the 10% level. This is possibly because the UCDP data contains few observations in the post-2005 period. The same does not appear to be true of the CEDE data.

Table A3. Time period extension

|  | (A10) | (A11)  FARC Conflict events (UCDP) | (A12) | (A13) | (A14) | (A15)  FARC Conflict events (CEDE) | (A16) | (A17) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FARC Conflict incidence (UCDP) | ELN Conflict incidence (UCDP) | ELN Conflict events (UCDP) | FARC Conflict incidence (CEDE) | ELN Conflict incidence (CEDE) | ELN Conflict events (CEDE) |
|  |
|  |  |  |  |  |  |  |  |  |
| Coffee income | -0.05\* | -0.12\* | 0.01\* | 0.01 | -0.10\*\* | -1.03\*\* | -0.02 | -0.01 |
|  | (0.03) | (0.06) | (0.01) | (0.01) | (0.05) | (0.49) | (0.04) | (0.14) |
| Population | 0.02 | 0.08\* | -0.00 | 0.00 | -0.02 | 0.07 | -0.04 | -0.02 |
|  | (0.02) | (0.04) | (0.01) | (0.02) | (0.07) | (0.70) | (0.04) | (0.13) |
| Coca | 0.00\*\* | 0.00\*\* | -0.00\* | -0.00 | 0.00\*\*\* | 0.00\*\*\* | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |  |  |  |  |
| Observations | 23,900 | 23,900 | 23,900 | 23,900 | 15,290 | 15,290 | 15,290 | 15,290 |
| Number of units | 956 | 956 | 956 | 956 | 956 | 956 | 956 | 956 |
| Temporal coverage | 1989-2013 | 1989-2013 | 1989-2013 | 1989-2013 | 1993-2008 | 1993-2008 | 1993-2008 | 1993-2008 |
|  |  |  |  |  |  |  |  |  |
| First-Stage Diagnostics | | | |  |  |  |  |  |
| KP F-Statistic | 22.06 | 22.06 | 22.06 | 22.06 | 19.47 | 19.47 | 19.47 | 19.47 |
| KP LM-Statistic (P) | 0.05 | 0.05 | 0.05 | 0.05 | 0.02 | 0.02 | 0.02 | 0.02 |
| Hansen J-Statistic (P) | 0.89 | 0.61 | 0.39 | 0.47 | 0.19 | 0.65 | 0.12 | 0.17 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Logged dependent variable*

To further examine the specification of the dependent variable, logged versions of the count variables were used in a repetition of Models 1-8. As can be seen, the FARC variables increase in statistical significance from Models 8 and 12 in Table 3.

Table A4. Using a logged version of the dependent variable

|  | (A18) | (A19)  FARC Conflict events (CEDE) | (A20) | (A21) |
| --- | --- | --- | --- | --- |
|  | FARC Conflict events (UCDP) | ELN Conflict events (UCDP) | ELN Conflict events (CEDE) |
|  |
|  |  |  |  |  |
| Coffee income | -0.07\*\* | -0.16\*\* | -0.02 | -0.03 |
|  | (0.04) | (0.08) | (0.02) | (0.03) |
| Population | -0.02 | 0.02 | -0.01 | -0.03 |
|  | (0.04) | (0.06) | (0.02) | (0.03) |
| Coca | 0.00\*\* | 0.00\*\* | 0.00\*\* | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |
| Observations | 15,296 | 15,296 | 15,296 | 15,296 |
| Number of units | 956 | 956 | 956 | 956 |
| Temporal coverage | 1994-2005 | 1994-2005 | 1994-2005 | 1994-2005 |
|  |  |  |  |  |
| First-Stage Diagnostics | | | |  |
| KP F-Statistic | 19.18 | 27.29 | 19.18 | 27.29 |
| KP LM-Statistic (P) | 0.02 | 0.02 | 0.02 | 0.02 |
| Hansen J-Statistic (P) | 0.83 | 0.79 | 0.74 | 0.21 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Lagged intermediary variables*

It is possible that there is some feedback from conflict to the intermediary variables in Table 4. To further examine whether this is impacting the results, lagged versions of these mechanism variables were used in these stage two regressions. Results presented in the appendix showed very little difference from those presented above. Total government spending becomes insignificant in all models. Hours worked and wages lose significance in two models, but remain the most consistently strong of all the variables tested.

Table A5. Lagged mechanism variables and conflict

|  | FARC Conflict incidence (UCDP) | FARC Conflict events (UCDP) | FARC Conflict incidence (CEDE) | FARC Conflict events (CEDE) |
| --- | --- | --- | --- | --- |
|  |
| Local government spending | -0.00 | -0.00 | 0.00 | -0.02 |
| (0.00) | (0.00) | (0.00) | (0.02) |
|  |  |  |  |  |
| Education transfers | 0.00 | -0.00 | -0.00 | -0.01 |
|  | (0.00) | (0.01) | (0.00) | (0.03) |
|  |  |  |  |  |
| Health transfers | 0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.01) | (0.00) | (0.02) |
|  |  |  |  |  |
| Inequality (infant mortality) | 0.00 | 0.00 | 0.00 | 0.00 |
| (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |
| Log hours | -0.11 | -0.13 | -0.12 | -1.09\* |
| (0.08) | (0.15) | (0.13) | (0.58) |
|  |  |  |  |  |
| Log wages | -0.10\*\*\* | -0.23\*\*\* | -0.08 | -0.01 |
| (0.04) | (0.08) | (0.06) | (0.25) |
|  |  |  |  |  |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Spatial models*

It could be argued that observations are spatially correlated. In order to ensure that spatial correlation is not driving results presented in Table 1, the xsmle suite of commands in Stata 16 was used. Results presented in Table A7 of spatial models continued to reveal relationships described in the article after controlling for this correlation, with the exception of CEDE conflict incidence (A24). Models were selected based on the strategy described in Belotti, Hughes and Mortari (2017, p.157). Model A22 is a spatial Durbin model (SDM), while the remainder are FE spatial autocorrelation (SAC) models.

Table A6. Spatial autoregressive models with autoregressive disturbances

|  | (A22) | (A23)  FARC Conflict events (UCDP, SAC) | (A24) | (A25) |
| --- | --- | --- | --- | --- |
|  | FARC Conflict incidence (UCDP, SDM) | FARC Conflict incidence (CEDE, SAC) | FARC Conflict events (CEDE, SAC) |
|  |
|  |  |  |  |  |
| Coffee income | -0.02\*\*\* | -0.06\*\*\* | -0.01 | -0.10\*\* |
|  | 0.01 | 0.01 | 0.01 | 0.04 |
| Population | 0.00 | 0.06 | -0.13\*\*\* | 0.66\*\*\* |
|  | 0.02 | 0.04 | 0.04 | 0.22 |
| Coca | 0.00\*\*\* | 0.00\*\*\* | 0.00\*\*\* | 0.00\*\*\* |
|  | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  |
| Observations | 16,252 | 16,252 | 17,208 | 17,208 |
| Number of units | 956 | 956 | 956 | 956 |
|  |  |  |  |  |
| Spatial parameters | | | |  |
| Rho | 0.60\*\*\* | 0.74\*\*\* | 0.74\*\*\* | 0.84\*\*\* |
|  | 0.06 | 0.06 | 0.06 | 0.04 |
| Lambda | 0.55\*\*\* | 0.74\*\*\* | 0.73\*\*\* | 0.83\*\*\* |
|  | 0.09 | 0.06 | 0.07 | 0.04 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Interaction effects*

In order to examine whether grievances condition the effect of the opportunity mechanism interaction terms were included. Tables A8-11 reveal no evidence that grievances condition opportunity cost. Results should be taken with a pinch of salt, however, as the sample size is small.

Table A7. Interaction of opportunity cost and grievance variables (UCDP dummy variable)

|  | (A26) | (A27)  FARC  Conflict incidence (UCDP) | (A28) | (A29) | (A30) |
| --- | --- | --- | --- | --- | --- |
| FARC Conflict incidence (UCDP) | FARC Conflict incidence (UCDP) | FARC Conflict incidence (UCDP) | FARC Conflict incidence (UCDP) |
|  |  |  |  |  |  |
| Log wages | -0.08\*\*\* | 0.28 | 0.59 | -0.20 | -0.02 |
|  | (0.03) | (0.37) | (0.46) | (0.13) | (0.04) |
| Education transfers |  | 0.27 |  |  |  |
|  |  | (0.26) |  |  |  |
| Education transfers\*  Log wages |  | -0.04 |  |  |  |
|  | (0.04) |  |  |  |
| Health transfers |  |  | 0.48 |  |  |
|  |  |  | (0.31) |  |  |
| Health transfers\*  Log wages |  |  | -0.06 |  |  |
|  |  | (0.04) |  |  |
| Local government spending (LGS) |  |  |  | -0.15 |  |
|  |  |  | (0.17) |  |
| LGS\* Log wages |  |  |  | 0.02 |  |
|  |  |  |  | (0.02) |  |
| Inequality |  |  |  |  | 0.01 |
|  |  |  |  |  | (0.00) |
| Inequality\*Log wages |  |  |  |  | -0.00 |
|  |  |  |  |  | (0.00) |
| Population | 0.03\*\* | 0.04 | 0.02 | 0.04\*\* | 0.03\*\* |
|  | (0.02) | (0.03) | (0.03) | (0.02) | (0.02) |
| Coca | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Tax base | -0.01 | -0.01 | -0.01 | -0.01 | -0.02\* |
|  | (0.01) | (0.02) | (0.02) | (0.01) | (0.01) |
|  |  |  |  |  |  |
| Observations | 784 | 495 | 495 | 784 | 784 |
| Number of departments | 23 | 23 | 23 | 23 | 23 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

Table A8. Interaction of opportunity cost and grievance variables (UCDP count variable)

|  | (A31) | (A32)  FARC Conflict events (UCDP) | (A33) | (A34) | (A35) |
| --- | --- | --- | --- | --- | --- |
| FARC Conflict events (UCDP) | FARC Conflict events (UCDP) | FARC Conflict events (UCDP) | FARC Conflict events (UCDP) |
|  |  |  |  |  |  |
| Log wages | -0.17\*\* | -1.54 | -0.97 | -0.51\*\* | -0.12 |
|  | (0.08) | (1.33) | (1.28) | (0.26) | (0.11) |
| Education transfers |  | -0.87 |  |  |  |
|  |  | (0.86) |  |  |  |
| Education transfers\*  Log wages |  | 0.12 |  |  |  |
|  | (0.12) |  |  |  |
| Health transfers |  |  | -0.44 |  |  |
|  |  |  | (0.83) |  |  |
| Health transfers\*  Log wages |  |  | 0.07 |  |  |
|  |  | (0.11) |  |  |
| Local government spending (LGS) |  |  |  | -0.43 |  |
|  |  |  | (0.28) |  |
| LGS\* Log wages |  |  |  | 0.06 |  |
|  |  |  |  | (0.04) |  |
| Inequality |  |  |  |  | 0.00 |
|  |  |  |  |  | (0.01) |
| Inequality\*Log wages |  |  |  |  | -0.00 |
|  |  |  |  |  | (0.00) |
| Population | 0.03 | 0.02 | -0.00 | 0.04 | 0.03 |
|  | (0.03) | (0.07) | (0.06) | (0.03) | (0.03) |
| Coca | 0.00\* | 0.00\*\* | 0.00\* | 0.00\* | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Tax base | 0.00 | 0.01 | 0.01 | -0.01 | -0.02 |
|  | (0.02) | (0.04) | (0.04) | (0.03) | (0.02) |
|  |  |  |  |  |  |
| Observations | 784 | 495 | 495 | 784 | 784 |
| Number of departments | 23 | 23 | 23 | 23 | 23 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

Table A9. Interaction of opportunity cost and grievance variables (CEDE dummy variable)

|  | (A36) | (A37)  FARC Conflict incidence (CEDE) | (A38) | (A39) | (A40) |
| --- | --- | --- | --- | --- | --- |
| FARC Conflict incidence (CEDE) | FARC Conflict incidence (CEDE) | FARC Conflict incidence (CEDE) | FARC Conflict incidence (CEDE) |
|  |  |  |  |  |  |
| Log wages | -0.11\*\* | -0.48 | 0.14 | -0.36\*\* | -0.18\*\*\* |
|  | (0.05) | (0.42) | (0.72) | (0.15) | (0.07) |
| Education transfers |  | -0.24 |  |  |  |
|  |  | (0.28) |  |  |  |
| Education transfers\*  Log wages |  | 0.03 |  |  |  |
|  | (0.04) |  |  |  |
| Health transfers |  |  | 0.22 |  |  |
|  |  |  | (0.48) |  |  |
| Health transfers\*  Log wages |  |  | -0.03 |  |  |
|  |  | (0.07) |  |  |
| Local government spending (LGS) |  |  |  | -0.28 |  |
|  |  |  | (0.19) |  |
| LGS\* Log wages |  |  |  | 0.04 |  |
|  |  |  |  | (0.03) |  |
| Inequality |  |  |  |  | -0.01 |
|  |  |  |  |  | (0.00) |
| Inequality\*Log wages |  |  |  |  | 0.00 |
|  |  |  |  |  | (0.00) |
| Population | 0.06\*\* | 0.09\*\* | 0.06 | 0.09\*\*\* | 0.07\*\*\* |
|  | (0.03) | (0.04) | (0.04) | (0.03) | (0.03) |
| Coca | 0.00 | 0.00\* | 0.00\* | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Tax base | -0.02 | -0.04\* | -0.04\* | -0.06\*\*\* | -0.03\* |
|  | (0.01) | (0.02) | (0.02) | (0.02) | (0.02) |
|  |  |  |  |  |  |
| Observations | 784 | 495 | 495 | 784 | 784 |
| Number of departments | 23 | 23 | 23 | 23 | 23 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

Table A10. Interaction of opportunity cost and grievance variables (CEDE count variable)

|  | (A41) | (A42)  FARC Conflict events (CEDE) | (A43) | (A44) | (A45) |
| --- | --- | --- | --- | --- | --- |
| FARC Conflict events (CEDE) | FARC Conflict events (CEDE) | FARC Conflict events (CEDE) | FARC Conflict events (CEDE) |
|  |  |  |  |  |  |
| Log wages | -0.27 | 0.25 | 0.22 | -1.24\*\* | 0.15 |
|  | (0.23) | (2.01) | (2.68) | (0.53) | (0.53) |
| Education transfers |  | 0.50 |  |  |  |
|  |  | (1.39) |  |  |  |
| Education transfers\*  Log wages |  | -0.07 |  |  |  |
|  | (0.19) |  |  |  |
| Health transfers |  |  | 0.59 |  |  |
|  |  |  | (1.74) |  |  |
| Health transfers\*  Log wages |  |  | -0.07 |  |  |
|  |  | (0.24) |  |  |
| Local government spending (LGS) |  |  |  | -1.13 |  |
|  |  |  | (0.72) |  |
| LGS\* Log wages |  |  |  | 0.17\* |  |
|  |  |  |  | (0.10) |  |
| Inequality |  |  |  |  | 0.04 |
|  |  |  |  |  | (0.05) |
| Inequality\*Log wages |  |  |  |  | -0.00 |
|  |  |  |  |  | (0.01) |
| Population | 0.24\*\* | 0.23 | 0.13 | 0.33\*\*\* | 0.28\*\* |
|  | (0.11) | (0.24) | (0.26) | (0.12) | (0.11) |
| Coca | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Tax base | -0.03 | -0.02 | -0.03 | -0.16\* | -0.22\*\*\* |
|  | (0.06) | (0.11) | (0.12) | (0.09) | (0.07) |
|  |  |  |  |  |  |
| Observations | 784 | 495 | 495 | 784 | 784 |
| Number of departments | 23 | 23 | 23 | 23 | 23 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Fixed effects regression*

In order to confirm that the method of instrumental variables is not causing spurious results – that is the negative relationship between coffee income and conflict exists when endogenous variables are used, simple fixed effects models were computed with the original endogenous variable (coffee intensity\*log internal price of coffee). Table A11 reveals remarkably similar results to those in Table 2. The only exception is a significant result for coffee income in model A48. The substantive value is very small and this is the only time coffee income is significantly associated with conflict activity by the ELN, suggesting it is a feature of the specific sample (when an endogenous variable is used), rather than a robust relation.

Table A11. Standard fixed effects models

|  | (A46) | (A47)  FARC Conflict events (UCDP) | (A48) | (A49) | (A50) | (A51)  FARC Conflict events (CEDE) | (A52) | (A53) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FARC Conflict incidence (UCDP) | ELN Conflict incidence (UCDP) | ELN Conflict events (UCDP) | FARC Conflict incidence (CEDE) | ELN Conflict incidence (CEDE) | ELN Conflict events (CEDE) |
|  |
|  |  |  |  |  |  |  |  |  |
| Coffee income | -0.02\*\* | -0.06\*\* | -0.01\*\* | -0.02 | -0.02\*\* | -0.19\*\* | 0.02 | 0.02 |
|  | (0.01) | (0.03) | (0.00) | (0.02) | (0.01) | (0.07) | (0.01) | (0.04) |
| Population | -0.02 | 0.00 | -0.01 | -0.03 | -0.16 | 0.02 | -0.07 | -0.25 |
|  | (0.04) | (0.07) | (0.02) | (0.04) | (0.11) | (0.79) | (0.06) | (0.16) |
| Coca | 0.00\*\* | 0.00\*\* | 0.00\* | 0.00\*\* | 0.00 | 0.00\*\* | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |  |  |  |  |
| Observations | 16,252 | 16,252 | 16,252 | 16,252 | 12,422 | 12,422 | 12,422 | 12,422 |
| Number of units | 956 | 956 | 956 | 956 | 956 | 956 | 956 | 956 |
|  |  |  |  |  |  |  |  |  |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Exogenous coca income*

Primary models of this study use a dummy variable to control for the influence of coca on the relationship between coffee income and conflict. Recent studies have suggested coca income can be exogenously estimated using the US street price and local soil conditions in Colombia (see Nussio and Ugarriza (2021) for full discussion of this variable). Table A12 reports the results of models including this exogenous measure of coca income.

Table A12. Exogenous coca income control

|  | (A54) | (A55)  FARC Conflict events (UCDP) | (A56) | (A57) | (A58) | (A59)  FARC Conflict events (CEDE) | (A60) | (A61) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FARC Conflict incidence (UCDP) | ELN Conflict incidence (UCDP) | ELN Conflict events (UCDP) | FARC Conflict incidence (CEDE) | ELN Conflict incidence (CEDE) | ELN Conflict events (CEDE) |
|  |
|  |  |  |  |  |  |  |  |  |
| Coffee income | -0.08\*\* | -0.21\*\* | -0.02 | -0.04 | -0.13\*\*\* | -1.14\*\* | -0.06 | -0.22 |
|  | (0.04) | (0.10) | (0.02) | (0.04) | (0.05) | (0.52) | (0.04) | (0.18) |
| Population | -0.02 | 0.04 | -0.01 | -0.03 | -0.13 | 0.39 | -0.06 | -0.19 |
|  | (0.04) | (0.07) | (0.02) | (0.03) | (0.10) | (0.75) | (0.05) | (0.15) |
| Coca | 0.11\*\*\* | 0.29\*\* | -0.00 | -0.00 | 0.07 | 0.76 | -0.01 | -0.06\*\* |
|  | (0.04) | (0.12) | (0.00) | (0.01) | (0.06) | (0.47) | (0.01) | (0.03) |
|  |  |  |  |  |  |  |  |  |
| Observations | 15,264 | 15,264 | 15,264 | 15,264 | 12,396 | 12,396 | 12,396 | 12,396 |
| Number of units | 954 | 954 | 954 | 954 | 954 | 954 | 954 | 954 |
|  |  |  |  |  |  |  |  |  |
| First-Stage Diagnostics | | | |  |  |  |  |  |
| KP F-Statistic | 22.84 | 22.84 | 22.84 | 22.84 | 25.77 | 25.77 | 25.77 | 25.77 |
| KP LM-Statistic (P) | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 |
| Hansen J-Statistic (P) | 0.90 | 0.38 | 0.62 | 0.97 | 0.87 | 0.47 | 0.20 | 0.33 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Alternative targets*

It is possible that the ELN as a smaller group relies more heavily on guerrilla tactics and so uses attacks on infrastructure and acts of terrorism than direct confrontation with the Colombian national army. In order to ensure that any relationship between agricultural income and alternative conflict measures are not being missed, Table A13 reports results of models with two new dependent variables – attacks on private property and terrorist attacks. These variables are taken from the Panel Conflicto y Violencia of the Panel Municipal del CEDE. Results are extremely similar to Table 2, with the exception of Model 64, which reports a significant coefficient of coffee income at the 90% level. As this is below conventional standards, it does is not interpreted as a true failure of H1.

Table A13. Alternative conflict measures

|  | (A62) | (A63)  FARC attacks on private property (count) | (A64) | (A65) | (A66) | (A67)  FARC terrorist attacks  (count) | (A68) | (A69) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FARC attacks on private property (dummy) | ELN attacks on private property (dummy) | ELN attacks on private property (count) | FARC terrorist attacks (dummy) | ELN terrorist attacks (dummy) | ELN terrorist attacks (count) |
|  |
|  |  |  |  |  |  |  |  |  |
| Coffee income | -0.05\*\*\* | -0.07\*\*\* | -0.01\* | -0.01 | -0.05\*\*\* | -0.01 | 0.02 | 0.01 |
|  | (0.02) | (0.02) | (0.01) | (0.01) | (0.02) | (0.02) | (0.02) | (0.04) |
| Population | 0.01 | 0.02 | 0.00 | 0.01 | -0.04 | -0.06\* | -0.02\* | -0.03 |
|  | (0.03) | (0.05) | (0.01) | (0.02) | (0.05) | (0.04) | (0.01) | (0.03) |
| Coca | -0.00 | 0.00 | 0.00 | 0.00 | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |  |  |  |  |
| Observations | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 | 12,422 |
| Number of units | 956 | 956 | 956 | 956 | 956 | 956 | 956 | 956 |
|  |  |  |  |  |  |  |  |  |
| First-Stage Diagnostics | | | |  |  |  |  |  |
| KP F-Statistic | 27.30 | 27.30 | 27.30 | 27.30 | 27.30 | 27.30 | 27.30 | 27.30 |
| KP LM-Statistic (P) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| Hansen J-Statistic (P) | 0.48 | 0.30 | 0.30 | 0.32 | 0.58 | 0.06 | 0.14 | 0.12 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.

*Combined Operational Areas*

To check whether the relationship continues to hold in territory where both guerrilla groups are active, a dummy variable was created which recorded a 1 if both groups were active in that municipality in that year. Any years where both groups were inactive took a 0. All years with only one group active in the municipality were set to missing. Table A14 reports the results for both UCDP and CEDE data.

As can be seen, the coefficient of coffee income remains negative and significant in model A72 – FARC conflict events. It loses significance in Model A70. On inspection, this result can be assigned to a lack of municipal years in the UCDP data when both guerrilla groups were active (152), compared to the CEDE data (804). This is perhaps a result of the strict coding rules for UCDP conflict events.

Table A14. Restricting to Combined Operational Areas

|  | (A70) | (A71)  ELN Conflict events (UCDP) | (A72) | (A73) |
| --- | --- | --- | --- | --- |
|  | FARC Conflict events (UCDP) | FARC Conflict events (CEDE) | ELN Conflict events (CEDE) |
|  |
|  |  |  |  |  |
| Coffee income | -0.04 | -0.02 | -0.69\*\* | -0.17 |
|  | (0.05) | (0.03) | (0.35) | (0.14) |
| Population | -0.06 | -0.04 | -0.21 | -0.15 |
|  | (0.04) | (0.03) | (0.51) | (0.15) |
| Coca | 0.00\*\* | 0.00\* | 0.00\*\* | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
|  |  |  |  |  |
| Observations | 15,092 | 15,092 | 11,403 | 11,403 |
| Number of units | 956 | 956 | 956 | 956 |
| Temporal coverage | 1994-2005 | 1994-2005 | 1994-2005 | 1994-2005 |
|  |  |  |  |  |
| First-Stage Diagnostics | | | |  |
| KP F-Statistic | 17.32 | 17.32 | 23.58 | 23.58 |
| KP LM-Statistic (P) | 0.02 | 0.02 | 0.02 | 0.02 |
| Hansen J-Statistic (P) | 0.24 | 0.96 | 0.76 | 0.29 |

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year and region fixed effects omitted from table.