**Online Appendix**

**Strategic Resources for Drug Trafficking Organizations and the Geography of Violence: Evidence from Mexico**

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# Appendix 1. Variables and Summary Statistics

Table 1.1. Variables and Sources

|  |  |  |
| --- | --- | --- |
| Variable | Description | Source |
| *Dependent Variables* | | |
| Total Killings | Number of killings regardless of victim type. This database registers three types of violent events: 1) aggressions, events where drug cartels attacked government targets and security agents did not counter attack; 2) confrontations, events where there was crossfire between drug cartels and security agencies; and 3) executions, events where either the perpetrator or the victim was a member of a DTO and that were not result of prior confrontation or aggression (Atuesta, Siordia, and Lajous 2018, 5) | CIDE-PPD (Atuesta, Siordia, and Lajous 2018) |
| Inter DTO Killings | Number of killings in executions excluding police | CIDE-PPD (Atuesta, Siordia, and Lajous 2018) |
| *Independent Variables* | | |
| Distance to Closest US Border Segment (100 km, logged) | Locality’s distance to the closest portion of the border covering 100 km on each side of each border port of entry | Own calculations from: Department of Homeland Security (2017) and Customs and Border Protection (2019) |
| Distance to Closest US Border Segment (50 km, logged) | Locality’s distance to the closest portion of the border covering 50 km on each side of each border port of entry | Own calculations from: Department of Homeland Security (2017) and Customs and Border Protection (2019) |
| Distance to US Border (logged) | Locality’s distance to the US border | Own calculations from: Department of Homeland Security (2017) |
| Distance to Closest Port of Entry (logged) | Locality’s distance to the closest land border port of entry to the US. | Own calculations from: Customs and Border Protection (2019) |
| Distance to Closest Port of Entry Closest to Highways (logged) | Locality’s distance to the closest land border port of entry to the US that is in the lowest cluster of distance to Mexican highways.  Clusters were selected with a k-means algorithm. | Own calculations from: Customs and Border Protection (2019) and INEGI (2019) |
| Distance to Closest Pipeline (logged) | Locality’s distance to the closest oil and gas pipeline of PEMEX. It was not possible to distinguish between pipelines that transport oil or gas. INEGI only registers if PEMEX owns the pipeline and if it is active. According to PEMEX’s official information, approximately 35% of the pipelines transport only gas whereas the 20% transport only oil, the rest combine both products (CARTOCRITICA 2017). We do not posit different expectations about the type of resource because, in the end, the logic of extraction would be the same. However, anecdotal evidence suggests that DTOs focus on oil rather than on gas extraction (Pérez 2011). | Own calculations from: INEGI (2019) |
| Distance to Closest Port (logged) | Locality’s distance to closest non-military port (touristic, industrial, fishing). We rely on non-military seaports to avoid mixing areas with state military presence. | Own calculations from: Mexican Transportation Institute and INEGI (2019) |
| Distance to Closest Airport (logged) | Locality’s distance to the closest commercial airport. We only use data for the major airports as there is more clarity on the type of infrastructure they have. INEGI also collects information about minor landing lanes across the country, but these data are mixed with major airports landing lanes and it was not possible to distinguish between both types of facilities. | Own calculations from: INEGI’s topographic layers (2019) |
| Distance to Closest Highway (logged) | Locality’s distance to the closest paved highway. We use data on concrete-based highways rather than on the whole road network given the latter also includes ground-based paths, which might have a different logic given the costs of travel. | Own calculations from: INEGI (2019) |
| *Control Variables* | | |
| Number of DTOs (t-1) | Number of DTOs that were involved in violent events. | CIDE-PPD (Atuesta, Siordia, and Lajous 2018) |
| Killed DTO Members (logged, t-1) | Number of DTO members killed in confrontation events. | CIDE-PPD (Atuesta, Siordia, and Lajous 2018) |
| Detained DTO Members (logged, t-1) | Number of DTO members detained in confrontation events | CIDE-PPD (Atuesta, Siordia, and Lajous 2018) |
| DTO with control in the municipality, either: Zetas, Beltran Leyva, Sinaloa, Familia, Golfo, Juárez, or Tijuana. | Dummy variables equal to 1 if either group had control in each municipality. | Coscia and Ríos (2012) |
| PAN, PRD, or PRI mayor | Dummy variables equal to 1 if either party was governing the municipality in that year. | Lajous (2016) |
| Party Change | Dummy variable equal to 1 if the municipal party changed in the most recent election. | Own calculations from: Lajous (2016) |
| PRI, PRD, or PRI governor | Dummy variables equal to 1 if either party was governing the state in that year. | CIDAC |
| *(Continuation)* |  |  |
| Social Development | Index generated through principal components summarizing 4 social deprivation factors:   * Education * Access to public health * Access to dwelling services * Quality of dwellings (e.g. dirt floors). | CONEVAL (2010) |
| Population (logged) | Number of inhabitants | INEGI (2010) |
| Schooling | % of people 15 years old or older without basic education | INEGI (2010) |
| Marginalization Degree | Index generated through principal components summarizing 4 factors of economic marginalization:   * Education * Dwelling services * Population distribution * Income | CONAPO (2010) |
| Percent of Occupied Males | People of 12 years or older who, during the very week of the survey:   1. Worked at least one hour a day to produce goods and services in exchange for a monetary or physical reward, 2. Had a job but did not work because any cause without stopping to receive their income, 3. Had a job but did not work because any cause, stopped receiving their income, but had an ensured return to their jobs in less than 4 weeks, 4. Did not have a job but will have one in 4 or less weeks, 5. Worked for an hour or a day during the very week of the survey without receiving any reward in a familiar or not familiar business. | INEGI (2010) |
| Opium Suitability Area | % of locality’s territory covered by areas suitable for opium and marijuana cultivation. | Lujala (2010) |

Table 1.2. Summary Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mean | S.D. | Min | Max |
| *Dependent Variables* |  |  |  |  |
| Total Killings | .162056 | 9.366282 | 0 | 2680 |
| Inter DTO Killings | .1365101 | 8.761784 | 0 | 2526 |
|  |  |  |  |  |
| *Independent Variables* |  |  |  |  |
| Distance to Closest Border Segment (100 km, logged) | 6.458663 | .6719952 | -1.504514 | 7.216476 |
| Distance to Closest Border Segment (50 km, logged) | 6.458663 | .6719952 | -1.504514 | 7.216476 |
| Distance to US Border (logged) | 6.448699 | .7030255 | −1.98347 | 7.212097 |
| Distance to Closest Entry Port (logged) | 6.480181 | .6139311 | -.4227861 | 7.227599 |
| Distance to Closest Port Closest to Highways (logged) | 6.451616 | .696179 | -1.979354 | 7.214999 |
| Distance to Closest Pipeline (logged) | 3.260524 | 1.585659 | -7.996676 | 6.013199 |
| Distance to Closest Port (logged) | 4.751879 | .8067193 | -2.178063 | 6.52528 |
| Distance to Closest Airport (logged) | 4.133319 | .7797654 | -2.604045 | 5.880545 |
| Distance to Closest Highway (logged) | −.2036021 | 1.727951 | -12.15081 | 4.71767 |
|  |  |  |  |  |
| *Control Variables* |  |  |  |  |
| Number of DTOs (t-1) | .0035887 | .0970886 | 0 | 9 |
| Killed DTO Members (logged, t-1) | .0016834 | .0501328 | 0 | 3.465736 |
| Detained DTO Members (logged, t-1) | .0027589 | .0743613 | 0 | 4.234107 |
| Zetas | .2459295 | .4306381 | 0 | 1 |
| Beltran Leyva | .0895274 | .2855042 | 0 | 1 |
| Sinaloa | .1197662 | .3246888 | 0 | 1 |
| Familia | .1132523 | .3169018 | 0 | 1 |
| Golfo | .1778921 | .3824229 | 0 | 1 |
| Juárez | .0394018 | .1945495 | 0 | 1 |
| Tijuana | .0308706 | .1729675 | 0 | 1 |
| PAN | .258798 | .4379756 | 0 | 1 |
| PRI | .5469695 | .4977903 | 0 | 1 |
| PRD | .1149618 | .3189766 | 0 | 1 |
| Party Change | .4762193 | .4994355 | 0 | 1 |
| PRI Governor | .5678224 | .4953801 | 0 | 1 |
| PAN Governor | .1997271 | .3997963 | 0 | 1 |
| PRD Governor | .2125903 | .4091412 | 0 | 1 |
| Social Development | 2.196133 | .9009622 | 1 | 5 |
| Population (logged) | 6.005269 | 1.279497 | 1.098612 | 14.41203 |
| Schooling | 50.84811 | 12.86333 | 0 | 100 |
| Marginalization Degree | 3.623841 | .8627837 | 1 | 5 |
| Percent of Occupied Males | 94.99016 | 8.034237 | 0 | 100 |
| Opium Suitability Area | 5.70994 | 23.17115 | 0 | 100 |

# Appendix 2. Robustness Checks

## 2.1 Models Without Controls

Table 2.1.1. Mediation Negative Binomial Estimates

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Violence | Inter DTO Violence |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.516\*\*\* | −0.437\*\*\* |
|  | (0.028) | (0.027) |
| Distance to Closest Pipeline (logged) | 0.104\*\*\* | 0.103\*\*\* |
|  | (0.013) | (0.013) |
| Distance to Closest Port (logged) | −0.154\*\*\* | −0.163\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Airport (logged) | −0.440\*\*\* | −0.469\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Highway (logged) | 0.211\*\*\* | 0.200\*\*\* |
|  | (0.014) | (0.013) |
| Number of DTOs | 3.682\*\*\* | 3.707\*\*\* |
|  | (0.194) | (0.187) |
| Constant | 2.311\*\*\* | 1.730\*\*\* |
|  | (0.244) | (0.235) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.558\*\*\* | −0.558\*\*\* |
|  | (0.056) | (0.056) |
| Distance to Closest Pipeline (logged) | 0.008 | 0.008 |
|  | (0.025) | (0.025) |
| Distance to Closest Port (logged) | −0.160\*\*\* | −0.160\*\*\* |
|  | (0.041) | (0.041) |
| Distance to Closest Airport (logged) | −0.573\*\*\* | −0.573\*\*\* |
|  | (0.042) | (0.042) |
| Distance to Closest Highway (logged) | 0.259\*\*\* | 0.259\*\*\* |
|  | (0.026) | (0.026) |
| Constant | 1.337\*\* | 1.337\*\* |
|  | (0.479) | (0.479) |
| Observations | 299856 | 299856 |
| Log likelihood | −45866.380 | -42167.226 |

Note: Standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.1.2. Effects on Total Violence

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.030 | 0.128\*\*\* | 0.555\*\*\* | 0.121\*\*\* | 2.592\*\*\* |
|  | (0.094) | (0.030) | (0.085) | (0.023) | (0.283) |
| Direct | 1.110\*\*\* | 0.597\*\*\* | 0.857\*\*\* | 0.644\*\*\* | 1.235\*\*\* |
|  | (0.014) | (0.017) | (0.019) | (0.014) | (0.017) |
| Total | 1.143 | 0.076\*\*\* | 0.476\*\*\* | 0.078\*\*\* | 3.202\*\*\* |
|  | (0.106) | (0.018) | (0.074) | (0.015) | (0.351) |
| Observations | 299856 | 299856 | 299856 | 299856 | 299856 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.1.3. Effects on Inter DTO Violence

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.030 | 0.126\*\*\* | 0.553\*\*\* | 0.119\*\*\* | 2.609\*\*\* |
|  | (0.095) | (0.029) | (0.085) | (0.022) | (0.284) |
| Direct | 1.108\*\*\* | 0.646\*\*\* | 0.850\*\*\* | 0.625\*\*\* | 1.222\*\*\* |
|  | (0.014) | (0.017) | (0.019) | (0.014) | (0.016) |
| Total | 1.142 | 0.082\*\*\* | 0.470\*\*\* | 0.075\*\*\* | 3.189\*\*\* |
|  | (0.106) | (0.019) | (0.073) | (0.014) | (0.349) |
| Observations | 299856 | 299856 | 299856 | 299856 | 299856 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.2 Models with Additional Controls

We include and/or change some control variables that might shape both the drug market structure and the rates of violence. In the manuscript we used the *Social Development* index from the National Commission for Evaluation (CONEVAL) (2010). This index measures the amount of social deprivation capturing the quality of dwellings (ground-based soil, inhabitants per room) and people’s access to services such as health, education, and water. Although CONEVAL (2010) does not consider such an index to be a measure of poverty, we use it as a general measure of people’s access to resources that can shape localities’ vulnerability to drug violence. Another available index to measure such access to resources is the *Marginalization Index* from the National Commission of Population (CONAPO)(2010)—considered a multidimensional measure of poverty. This index tries to capture the income levels of population. However, at the locality level CONAPO uses the percentage of people with refrigerators to capture income rather than directly measuring the levels of income (CONAPO 2010). To account for these differences, we included the *Marginalization Index* in our models.

We included a couple of dummy variables capturing political factors associated with drug-violence. First, we added the dummy variable *PRD Governor*, equal to 1 when the PRD governs at the state level. In the core models of the manuscript, we left PRD governors as a reference category along with other smaller parties such as XXX. Even though the PRD is not as strong as the PRI or PAN, it is stronger than smaller parties such as *Nueva Alianza* or the *Partido del Trabajo,* or *Convergencia* measured by its electoral records at the state level*.* From 2006 to 2011, on average, the PRD governed 18% of all Mexican states, on average, whereas smaller parties governed just 2% of the states during the same period (CIDAC 2015). Mixing the PRD category with smaller parties might confuse the effect of the PRD with that of states governed by smaller parties. In addition, this allows measuring if only small parties are the ones isolated by national policies, a factor that researchers find to drive violence at the local level (Trejo and Ley 2016). Second, recent research suggest that partisan politics matter for drug-related violence because political changes motivate politicians to crack down on criminal groups and on criminal protection rackets destabilizing the equilibrium among DTOs and between them and government leaders, leading to more violence (Dell 2015; Trejo and Ley 2016, 2018). Therefore, we included the dummy *Partisan Change* equal to 1 if there was a partisan change in the most recent municipal election.

Local economic and social conditions help to explain when individuals have incentives to join DTOs or when are they more likely to be involved in forced recruitment. An important portion of the recruits to DTOs seems to be dominated by unemployed males which also drives violence and fragmentation of DTOs (Grillo 2012; Osorio 2015). Therefore, we included the percentage of occupied males in each locality (INEGI 2010).

Another change was the measure of state repression. We measured state repression as the number of DTO members killed in confrontations with security agencies. However, effective state repression is what deters non-state threats from arising, mainly through monitoring strategies. Detaining rather than killing DTO members is a better proxy for such monitoring capacities of the state because, to do so, security agencies need to track drug trafficking and then capture key figures rather than eliminating them in confrontations. As such, we used a lagged term for the *Number of Detainees* in confrontations with the state (logged).

Finally, areas with conditions to cultivate narcotics might also be more valuable for DTOs as they can increase their gains from controlling such territories (Lujala 2009). Thus, with the variable *Opium Suitability Area* we controlled for the percentage of each locality’s area that is suitable for opium cultivation with data from Lujala and Buhaugh (2005). Tables 3.2.1–3.2.3 show the results after these changes.

Table 2.2.1. Mediation Negative Binomial Estimates

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Violence | Inter DTO Violence |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.417\*\*\* | −0.343\*\*\* |
|  | (0.025) | (0.026) |
| Distance to Closest Pipeline (logged) | 0.216\*\*\* | 0.211\*\*\* |
|  | (0.015) | (0.016) |
| Distance to Closest Port (logged) | −0.101\*\*\* | −0.115\*\*\* |
|  | (0.023) | (0.023) |
| Distance to Closest Airport (logged) | 0.171\*\*\* | 0.160\*\*\* |
|  | (0.025) | (0.025) |
| Distance to Closest Highway (logged) | 0.010 | 0.007 |
|  | (0.014) | (0.014) |
| Number of DTOs | 1.770\*\*\* | 1.770\*\*\* |
|  | (0.073) | (0.069) |
| Total Violence (t-1) | 0.031\*\*\* |  |
|  | (0.009) |  |
| PAN Mayor | 0.149\* | 0.079 |
|  | (0.073) | (0.075) |
| PRI Mayor | 0.207\*\* | 0.171\* |
|  | (0.069) | (0.071) |
| PRD Mayor | 0.397\*\*\* | 0.366\*\*\* |
|  | (0.075) | (0.077) |
| PRI Governor | 0.072 | −0.060 |
|  | (0.159) | (0.159) |
| PAN Governor | −0.091 | −0.239 |
|  | (0.165) | (0.166) |
| PRD Governor | 0.523\*\*\* | 0.370\* |
|  | (0.159) | (0.159) |
| Marginalization Degree | −0.363\*\*\* | −0.312\*\*\* |
|  | (0.024) | (0.025) |
| Population (logged) | 0.979\*\*\* | 0.970\*\*\* |
|  | (0.015) | (0.016) |
| Schooling | −0.006\*\* | −0.006\*\* |
|  | (0.002) | (0.002) |
| Percent of Occupied Male | −0.005# | −0.002 |
|  | (0.003) | (0.003) |
| Opium Suitability Area | 0.005\*\*\* | 0.004\*\*\* |
|  | (0.001) | (0.001) |
| Party Change | 0.086\* | 0.144\*\*\* |
|  | (0.040) | (0.041) |
| Inter DTO Killings (t-1) |  | 0.011 |
|  |  | (0.009) |
| Constant | −7.100\*\*\* | −7.911\*\*\* |
|  | (0.431) | (0.452) |
| DTO dummies | Yes | Yes |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.350\*\*\* | −0.350\*\*\* |
|  | (0.037) | (0.037) |
| Distance to Closest Pipeline (logged) | 0.159\*\*\* | 0.159\*\*\* |
|  | (0.027) | (0.027) |
| Distance to Closest Port (logged) | −0.134\*\*\* | −0.134\*\*\* |
|  | (0.036) | (0.036) |
| Distance to Closest Airport (logged) | −0.077\* | −0.077\* |
|  | (0.039) | (0.039) |
| Distance to Closest Highway (logged) | −0.038 | −0.038 |
| (*Continuation)* |  |  |
|  | (0.029) | (0.029) |
| Number of DTOs (t-1) | 0.608\*\*\* | 0.608\*\*\* |
|  | (0.073) | (0.073) |
| Detained DTO Members (logged, t-1) | −0.010 | −0.010 |
|  | (0.105) | (0.105) |
| PAN Mayor | 0.546\*\*\* | 0.546\*\*\* |
|  | (0.132) | (0.132) |
| PRI Mayor | 0.488\*\*\* | 0.488\*\*\* |
|  | (0.133) | (0.133) |
| PRD Mayor | 0.641\*\*\* | 0.641\*\*\* |
|  | (0.134) | (0.134) |
| PRI Governor | 0.252 | 0.252 |
|  | (0.264) | (0.264) |
| PAN Governor | −0.408 | −0.408 |
|  | (0.276) | (0.276) |
| PRD Governor | 0.609\* | 0.609\* |
|  | (0.264) | (0.264) |
| Schooling | 0.004 | 0.004 |
|  | (0.004) | (0.004) |
| Population (logged) | 0.851\*\*\* | 0.851\*\*\* |
|  | (0.026) | (0.026) |
| Marginalization Degree | −0.532\*\*\* | −0.532\*\*\* |
|  | (0.046) | (0.046) |
| Percent of Occupied Male | −0.014\*\* | −0.014\*\* |
|  | (0.005) | (0.005) |
| Opium Suitability Area | 0.007\*\*\* | 0.007\*\*\* |
|  | (0.001) | (0.001) |
| Constant | −6.813\*\*\* | −6.813\*\*\* |
|  | (0.748) | (0.748) |
| Observations | 235467 | 235467 |
| Log Likelihood | −25541.169 | −23532.386 |
| Time Fixed Effects | Yes | Yes |

Note: Standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.2.2. Effects on Total Violence

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.324\*\*\* | 0.538\*\*\* | 0.788\*\*\* | 0.873# | 0.935 |
|  | (0.065) | (0.038) | (0.050) | (0.061) | (0.048) |
| Direct | 1.241\*\*\* | 0.659\*\*\* | 0.904\*\*\* | 1.186\*\*\* | 1.010 |
|  | (0.019) | (0.017) | (0.021) | (0.029) | (0.014) |
| Total | 1.644\*\*\* | 0.354\*\*\* | 0.712\*\*\* | 1.035 | 0.944 |
|  | (0.085) | (0.026) | (0.048) | (0.076) | (0.050) |
| Observations | 235467 | 235467 | 235467 | 235467 | 235467 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.2.3. Effects on Inter DTO Violence

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.324\*\*\* | 0.538\*\*\* | 0.788\*\*\* | 0.873# | 0.935 |
|  | (0.065) | (0.038) | (0.050) | (0.061) | (0.048) |
| Direct | 1.235\*\*\* | 0.710\*\*\* | 0.891\*\*\* | 1.173\*\*\* | 1.007 |
|  | (0.020) | (0.018) | (0.020) | (0.029) | (0.015) |
| Total | 1.636\*\*\* | 0.382\*\*\* | 0.703\*\*\* | 1.024 | 0.941 |
|  | (0.085) | (0.028) | (0.048) | (0.076) | (0.050) |
| Observations | 235467 | 235467 | 235467 | 235467 | 235467 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

After these changes, results remain equal: closeness to the US border and to sea ports increases violence significantly both directly and indirectly; closeness to pipelines is associated with less violence; and airports and highways show divergent patterns both in the signs of the effects and their statistical significance. Interestingly, when the PRD governs at the state level, not only violence increases, but also the number of DTOs which supports previous research (Trejo and Ley 2016).

## 2.3 Multilevel Effects Diagnostics and Models

One potential shortcoming of our models is that we are not considering multilevel effects from localities belonging to municipalities and/or states. To assess if a multilevel model is necessary in this context, we estimated the inter class correlation coefficients for both variables of interest, the number of DTOs and the number of homicides, and for two administrative levels, the municipality and the state.

Table 2.3.1: Inter Class Correlation Coefficients

|  |  |  |
| --- | --- | --- |
| Level | Variable | ICC |
| *Municipal* | Number of DTOs | 0.0006 |
| Total Violence | 0.0005 |
| Inter-DTO Killings | 0.0005 |
| *State* | Number of DTOs | 0.0059 |
| Total Violence | 0.0013 |
| Inter-DTO Killings | 0.0013 |

Table 2.3.1 shows the results of these estimations and suggest that a very small portion of the variability in violence is related to variability at the municipal or state level. Specifically, all coefficients indicate that less than 1% of the violence at the local level is related to endogenous factors of superior levels, rendering multilevel models unnecessary.

In any case, as the ICC at the state level is higher than at the municipal level, we estimated multilevel models with localities nested in states. Due to convergence issues, we could only replicate the models without control variables. Tables 2.3.2–2.3.4 show that results remain equal after these estimations. Whereas closeness to pipelines is associated with less violence, localities closer to the US border and ports experience more violence. However, the effects of closeness to highways and airports even though they are significant are different from the original estimations.

Table 2.3.2. Mediation Negative Binomial Estimates with Localities Nested in States

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Violence | Inter DTO Violence |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.492\*\*\* | −0.421\*\*\* |
|  | (0.028) | (0.027) |
| Distance to Closest Pipeline (logged) | 0.093\*\*\* | 0.098\*\*\* |
|  | (0.013) | (0.013) |
| Distance to Closest Port (logged) | −0.107\*\*\* | −0.102\*\*\* |
|  | (0.023) | (0.022) |
| Distance to Closest Airport (logged) | −0.441\*\*\* | −0.462\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Highway (logged) | 0.173\*\*\* | 0.158\*\*\* |
|  | (0.014) | (0.013) |
| Number of DTOs | 3.629\*\*\* | 3.676\*\*\* |
|  | (0.185) | (0.177) |
| Constant | 2.117\*\*\* | 1.479\*\*\* |
|  | (0.239) | (0.227) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.513\*\*\* | −0.513\*\*\* |
|  | (0.054) | (0.054) |
| Distance to Closest Pipeline (logged) | 0.012 | 0.012 |
|  | (0.025) | (0.025) |
| Distance to Closest Port (logged) | −0.089\* | −0.089\* |
|  | (0.042) | (0.042) |
| Distance to Closest Airport (logged) | −0.614\*\*\* | −0.614\*\*\* |
|  | (0.043) | (0.043) |
| Distance to Closest Highway (logged) | 0.234\*\*\* | 0.234\*\*\* |
|  | (0.026) | (0.026) |
| Constant | 1.028\* | 1.028\* |
|  | (0.461) | (0.461) |
| State-level Variance Second Step | 2.338\* | 2.535\* |
|  | (0.916) | (0.990) |
| State-level Variance First Step | 4.583\* | 4.583\* |
|  | (2.233) | (2.233) |
| Observations | 299856 | 299856 |
| Log Likelihood | −45795.991 | −42045.823 |
| Time Fixed Effects | Yes | Yes |
| Controls | No | No |

Note: Standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 2.3.3. Effects on Total Violence

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.043 | 0.156\*\*\* | 0.724\* | 0.108\*\*\* | 2.339\*\*\* |
|  | (0.096) | (0.034) | (0.111) | (0.021) | (0.245) |
| Direct | 1.098\*\*\* | 0.611\*\*\* | 0.898\*\*\* | 0.643\*\*\* | 1.189\*\*\* |
|  | (0.014) | (0.017) | (0.020) | (0.014) | (0.016) |
| Total | 1.145 | 0.095\*\*\* | 0.650\*\* | 0.069\*\*\* | 2.780\*\*\* |
|  | (0.106) | (0.021) | (0.101) | (0.013) | (0.293) |
| Observations | 299856 | 299856 | 299856 | 299856 | 299856 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 2.3.4. Effects on Inter DTO Violence

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.043 | 0.152\*\*\* | 0.721\* | 0.105\*\*\* | 2.365\*\*\* |
|  | (0.097) | (0.033) | (0.112) | (0.020) | (0.248) |
| Direct | 1.103\*\*\* | 0.657\*\*\* | 0.903\*\*\* | 0.630\*\*\* | 1.171\*\*\* |
|  | (0.014) | (0.018) | (0.020) | (0.014) | (0.016) |
| Total | 1.151 | 0.100\*\*\* | 0.651\*\* | 0.066\*\*\* | 2.769\*\*\* |
|  | (0.108) | (0.022) | (0.102) | (0.013) | (0.292) |
| Observations | 299856 | 299856 | 299856 | 299856 | 299856 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.4 Models with Fixed Effects by State

One potential concern is that unobserved features shape the dynamics of violence and the market structure of DTOs. The common approach would be to include dummies for every locality, but this would significantly diminish our degrees of freedom because of the number of localities (49, 981). Another approach would be to calculate within estimators for each independent variable. However, our main constraint is that, given our core independent variables are fixed geographical features, we would lose them by calculating the differences from the mean. Lastly, we could include municipal level fixed effects but due to convergence problems, we just included state fixed effects. In any case, this might be an advantage because state features and state-level dynamics between DTOs have shaped much of the drug trafficking networks since mid-twentieth century (Grillo 2012). As Tables 3.4.1–3.4.3 show, after these estimations our results remain equal.

#### Table 2.4.1. Mediation Negative Binomial Estimates

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Violence | Inter DTO Violence |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.290\*\*\* | −0.222\*\*\* |
|  | (0.034) | (0.034) |
| Distance to Closest Pipeline (logged) | 0.110\*\*\* | 0.091\*\*\* |
|  | (0.016) | (0.017) |
| Distance to Closest Port (logged) | −0.106\*\*\* | −0.117\*\*\* |
|  | (0.029) | (0.030) |
| Distance to Closest Airport (logged) | 0.104\*\*\* | 0.087\*\*\* |
|  | (0.024) | (0.024) |
| Distance to Closest Highway (logged) | 0.048\*\*\* | 0.043\*\* |
|  | (0.014) | (0.015) |
| Number of DTOs | 1.438\*\*\* | 1.411\*\*\* |
|  | (0.062) | (0.059) |
| Total Violence (t-1) | −0.007\*\*\* |  |
|  | (0.001) |  |
| PAN Mayor | −0.100 | −0.131# |
|  | (0.075) | (0.077) |
| PRI Mayor | −0.037 | −0.020 |
|  | (0.073) | (0.075) |
| PRD Mayor | 0.172\* | 0.159\* |
|  | (0.076) | (0.078) |
| PRI Governor | 0.448\* | 0.258 |
|  | (0.179) | (0.179) |
| PAN Governor | 0.411# | 0.255 |
|  | (0.240) | (0.255) |
| Zetas | 0.279\*\*\* | 0.207\*\*\* |
|  | (0.044) | (0.045) |
| Beltran Leyva | 0.134\* | 0.105# |
|  | (0.057) | (0.057) |
| Sinaloa | −0.020 | −0.016 |
|  | (0.055) | (0.056) |
| Familia | −0.083 | −0.066 |
|  | (0.060) | (0.061) |
| Golfo | 0.099# | 0.115\* |
|  | (0.054) | (0.055) |
| Juárez | 0.164\* | 0.205\*\* |
| (*Continuation)* |  |  |
|  | (0.075) | (0.074) |
| Tijuana | −0.121 | −0.089 |
|  | (0.094) | (0.093) |
| Social Development | −0.552\*\*\* | −0.506\*\*\* |
|  | (0.033) | (0.034) |
| Population (logged) | 0.986\*\*\* | 0.964\*\*\* |
|  | (0.014) | (0.015) |
| Schooling | −0.015\*\*\* | −0.014\*\*\* |
|  | (0.002) | (0.002) |
| Inter DTO Killings (t-1) |  | −0.008\*\*\* |
|  |  | (0.001) |
| Constant | −7.968\*\*\* | −8.367\*\*\* |
|  | (0.482) | (0.506) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.189\*\*\* | −0.189\*\*\* |
|  | (0.049) | (0.049) |
| Distance to Closest Pipeline (logged) | −0.005 | −0.005 |
|  | (0.029) | (0.029) |
| Distance to Closest Port (logged) | −0.202\*\*\* | −0.202\*\*\* |
|  | (0.049) | (0.049) |
| Distance to Closest Airport (logged) | −0.057 | −0.057 |
|  | (0.038) | (0.038) |
| Distance to Closest Highway (logged) | 0.040 | 0.040 |
|  | (0.031) | (0.031) |
| Number of DTOs (t-1) | 0.127\* | 0.127\* |
|  | (0.051) | (0.051) |
| Killed DTO Members (logged, t-1) | 0.103 | 0.103 |
|  | (0.099) | (0.099) |
| PAN Mayor | 0.368\*\* | 0.368\*\* |
|  | (0.128) | (0.128) |
| PRI Mayor | 0.267\* | 0.267\* |
|  | (0.136) | (0.136) |
| PRD Mayor | 0.311\* | 0.311\* |
|  | (0.136) | (0.136) |
| PRI Governor | −0.536 | −0.536 |
|  | (0.434) | (0.434) |
| PAN Governor | −1.614\*\*\* | −1.614\*\*\* |
|  | (0.489) | (0.489) |
| Social Development | −0.707\*\*\* | −0.707\*\*\* |
|  | (0.074) | (0.074) |
| Population (logged) | 0.879\*\*\* | 0.879\*\*\* |
|  | (0.025) | (0.025) |
| Schooling | −0.014\*\*\* | −0.014\*\*\* |
|  | (0.004) | (0.004) |
| Constant | −7.463\*\*\* | −7.463\*\*\* |
|  | (0.904) | (0.904) |
| Observations | 235997 | 235997 |
| Log Likelihood | −23838.148 | −21874.734 |
| Time Fixed Effects | Yes | Yes |
| State Fixed Effects | Yes | Yes |

Note: Standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.4.2. Effects on Total Violence

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 0.992 | 0.762\*\*\* | 0.748\*\*\* | 0.921 | 1.060 |
|  | (0.042) | (0.055) | (0.054) | (0.050) | (0.047) |
| Direct | 1.116\*\*\* | 0.748\*\*\* | 0.899\*\*\* | 1.110\*\*\* | 1.049\*\*\* |
|  | (0.018) | (0.026) | (0.026) | (0.027) | (0.015) |
| Total | 1.107\* | 0.571\*\*\* | 0.672\*\*\* | 1.022 | 1.112\* |
|  | (0.050) | (0.045) | (0.052) | (0.061) | (0.052) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.4.3. Effects on Inter DTO Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 0.992 | 0.766\*\*\* | 0.752\*\*\* | 0.923 | 1.059 |
|  | (0.041) | (0.054) | (0.053) | (0.049) | (0.046) |
| Direct | 1.095\*\*\* | 0.801\*\*\* | 0.890\*\*\* | 1.091\*\*\* | 1.044\*\* |
|  | (0.019) | (0.027) | (0.027) | (0.027) | (0.015) |
| Total | 1.087# | 0.614\*\*\* | 0.669\*\*\* | 1.007 | 1.105\* |
|  | (0.048) | (0.048) | (0.051) | (0.059) | (0.051) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.5 Models without the Ten Most Violent Localities

We also conducted some tests without influential observations that might bias our results. We first excluded the ten localities with more homicides on average during the period and found the same result as original models. As the following tables show, pipelines keep their negative direct effect on violence; ports and the US border hold their direct and indirect negative effects; and airports and highways their direct negative effects on violence.

#### Table 2.5.1 Mediation Negative Binomial Estimates without Ten Most Violent Localities

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Violence | Inter DTO Violence |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.403\*\*\* | −0.323\*\*\* |
|  | (0.024) | (0.024) |
| Distance to Closest Pipeline (logged) | 0.230\*\*\* | 0.217\*\*\* |
|  | (0.014) | (0.015) |
| Distance to Closest Port (logged) | −0.104\*\*\* | −0.119\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Airport (logged) | 0.176\*\*\* | 0.160\*\*\* |
|  | (0.024) | (0.025) |
| Distance to Closest Highway (logged) | 0.056\*\*\* | 0.050\*\*\* |
|  | (0.014) | (0.015) |
| Number of DTOs | 1.781\*\*\* | 1.774\*\*\* |
|  | (0.074) | (0.071) |
| Total Violence (t-1) | 0.176\*\*\* |  |
|  | (0.016) |  |
| PAN Mayor | 0.148\* | 0.060 |
|  | (0.073) | (0.075) |
| PRI Mayor | 0.192\*\* | 0.159\* |
|  | (0.069) | (0.071) |
| PRD Mayor | 0.396\*\*\* | 0.364\*\*\* |
|  | (0.075) | (0.077) |
| PRI Governor | −0.418\*\*\* | −0.430\*\*\* |
|  | (0.052) | (0.053) |
| PAN Governor | −0.641\*\*\* | −0.665\*\*\* |
|  | (0.067) | (0.070) |
| Zetas | 0.317\*\*\* | 0.238\*\*\* |
|  | (0.045) | (0.046) |
| Beltran Leyva | 0.559\*\*\* | 0.518\*\*\* |
|  | (0.055) | (0.056) |
| Sinaloa | 0.611\*\*\* | 0.657\*\*\* |
|  | (0.054) | (0.055) |
| Familia | 0.089 | 0.115\* |
|  | (0.055) | (0.057) |
| Golfo | −0.142\*\* | −0.187\*\*\* |
|  | (0.052) | (0.054) |
| Juárez | 0.789\*\*\* | 0.896\*\*\* |
|  | (0.074) | (0.075) |
| (*Continuation)* |  |  |
| Tijuana | −0.221\* | −0.085 |
|  | (0.087) | (0.087) |
| Social Development | −0.711\*\*\* | −0.656\*\*\* |
|  | (0.030) | (0.031) |
| Population (logged) | 0.902\*\*\* | 0.887\*\*\* |
|  | (0.015) | (0.015) |
| Schooling | −0.003# | −0.003# |
|  | (0.002) | (0.002) |
| Inter DTO Killings (t-1) |  | 0.179\*\*\* |
|  |  | (0.017) |
| Constant | −6.647\*\*\* | −7.138\*\*\* |
|  | (0.288) | (0.297) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.352\*\*\* | −0.352\*\*\* |
|  | (0.036) | (0.036) |
| Distance to Closest Pipeline (logged) | 0.191\*\*\* | 0.191\*\*\* |
|  | (0.025) | (0.025) |
| Distance to Closest Port (logged) | −0.113\*\* | −0.113\*\* |
|  | (0.035) | (0.035) |
| Distance to Closest Airport (logged) | −0.072# | −0.072# |
|  | (0.039) | (0.039) |
| Distance to Closest Highway (logged) | 0.025 | 0.025 |
|  | (0.031) | (0.031) |
| Number of DTOs (t-1) | 0.711\*\*\* | 0.711\*\*\* |
|  | (0.078) | (0.078) |
| Killed DTO Members (logged, t-1) | 0.516\*\*\* | 0.516\*\*\* |
|  | (0.134) | (0.134) |
| PAN Mayor | 0.573\*\*\* | 0.573\*\*\* |
|  | (0.132) | (0.132) |
| PRI Mayor | 0.488\*\*\* | 0.488\*\*\* |
|  | (0.133) | (0.133) |
| PRD Mayor | 0.669\*\*\* | 0.669\*\*\* |
|  | (0.134) | (0.134) |
| PRI Governor | −0.238\* | −0.238\* |
|  | (0.097) | (0.097) |
| PAN Governor | −0.953\*\*\* | −0.953\*\*\* |
|  | (0.125) | (0.125) |
| Social Development | −0.992\*\*\* | −0.992\*\*\* |
|  | (0.068) | (0.068) |
| Population (logged) | 0.803\*\*\* | 0.803\*\*\* |
|  | (0.026) | (0.026) |
| Schooling | 0.002 | 0.002 |
|  | (0.004) | (0.004) |
| Constant | −7.452\*\*\* | −7.452\*\*\* |
|  | (0.500) | (0.500) |
| Observations | 235947 | 235947 |
| Log Likelihood | −24742.530 | −22772.907 |
| Time Fixed Effects | Yes | Yes |

Note: Standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.5.2 Effects on Total Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.404\*\*\* | 0.534\*\*\* | 0.818\*\* | 0.880# | 1.046 |
|  | (0.067) | (0.037) | (0.052) | (0.062) | (0.058) |
| Direct | 1.258\*\*\* | 0.668\*\*\* | 0.901\*\*\* | 1.192\*\*\* | 1.057\*\*\* |
|  | (0.018) | (0.016) | (0.019) | (0.029) | (0.015) |
| Total | 1.767\*\*\* | 0.357\*\*\* | 0.738\*\*\* | 1.049 | 1.106# |
|  | (0.088) | (0.026) | (0.049) | (0.078) | (0.064) |
| Observations | 235947 | 235947 | 235947 | 235947 | 235947 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.5.3. Effects on Inter DTO Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.402\*\*\* | 0.536\*\*\* | 0.819\*\* | 0.880# | 1.046 |
|  | (0.066) | (0.037) | (0.051) | (0.061) | (0.058) |
| Direct | 1.242\*\*\* | 0.724\*\*\* | 0.887\*\*\* | 1.173\*\*\* | 1.051\*\*\* |
|  | (0.019) | (0.017) | (0.019) | (0.029) | (0.016) |
| Total | 1.741\*\*\* | 0.388\*\*\* | 0.727\*\*\* | 1.033 | 1.099 |
|  | (0.086) | (0.028) | (0.048) | (0.076) | (0.063) |
| Observations | 235947 | 235947 | 235947 | 235947 | 235947 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.6 Models with Robust Standard Errors

#### Table 2.6.1. Mediation Negative Binomial Models with Robust Standard Errors

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Violence | Inter DTO Violence |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.411\*\*\* | −0.332\*\*\* |
|  | (0.037) | (0.031) |
| Distance to Closest Pipeline (logged) | 0.243\*\*\* | 0.230\*\*\* |
|  | (0.024) | (0.023) |
| Distance to Closest Port (logged) | −0.108\*\*\* | −0.125\*\*\* |
|  | (0.029) | (0.029) |
| Distance to Closest Airport (logged) | 0.192\*\*\* | 0.179\*\*\* |
|  | (0.034) | (0.034) |
| Distance to Closest Highway (logged) | 0.066# | 0.061\* |
|  | (0.035) | (0.030) |
| Number of DTOs | 1.738\*\*\* | 1.728\*\*\* |
|  | (0.115) | (0.118) |
| Total Violence (t-1) | 0.020 |  |
|  | (0.039) |  |
| Inter DTO Killings (t-1) |  | 0.004 |
|  |  | (0.042) |
| Constant | −6.784\*\*\* | −7.293\*\*\* |
|  | (0.421) | (0.425) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.349\*\*\* | −0.349\*\*\* |
|  | (0.036) | (0.036) |
| Distance to Closest Pipeline (logged) | 0.189\*\*\* | 0.189\*\*\* |
|  | (0.030) | (0.030) |
| Distance to Closest Port (logged) | −0.105\*\* | −0.105\*\* |
|  | (0.036) | (0.036) |
| Distance to Closest Airport (logged) | −0.063 | −0.063 |
|  | (0.047) | (0.047) |
| Distance to Closest Highway (logged) | 0.026 | 0.026 |
|  | (0.050) | (0.050) |
| Constant | −7.526\*\*\* | −7.526\*\*\* |
|  | (0.517) | (0.517) |
| Observations | 235997 | 235997 |
| Log likelihood | −25329.709 | −23340.728 |
| Time Fixed Effects | Yes | Yes |
| Controls | Yes | Yes |

Note: Standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.6.2. Effects on Total Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.390\*\*\* | 0.546\*\*\* | 0.833\*\* | 0.896 | 1.047 |
|  | (0.076) | (0.040) | (0.052) | (0.074) | (0.092) |
| Direct | 1.275\*\*\* | 0.663\*\*\* | 0.898\*\*\* | 1.212\*\*\* | 1.068# |
|  | (0.031) | (0.025) | (0.026) | (0.041) | (0.037) |
| Total | 1.773\*\*\* | 0.362\*\*\* | 0.748\*\*\* | 1.086 | 1.118 |
|  | (0.108) | (0.031) | (0.054) | (0.101) | (0.111) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 2.6.3. Effects on Inter DTO Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.387\*\*\* | 0.547\*\*\* | 0.833\*\* | 0.897 | 1.047 |
|  | (0.076) | (0.040) | (0.052) | (0.074) | (0.091) |
| Direct | 1.259\*\*\* | 0.718\*\*\* | 0.882\*\*\* | 1.196\*\*\* | 1.063\* |
|  | (0.030) | (0.022) | (0.026) | (0.041) | (0.032) |
| Total | 1.747\*\*\* | 0.393\*\*\* | 0.735\*\*\* | 1.072 | 1.113 |
|  | (0.107) | (0.033) | (0.053) | (0.100) | (0.108) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.7 Models with Different Border Measures

The US-Mexico border might not be uniform in its importance. In the core models we included segments of the border covering 100 km of each port of entry side by side. However, either the very point of entry might be the important resource for DTOs, shorter segments, or the whole border. Thus, by only focusing on one segment, our results might be biased by not measuring the border properly. To assess such potential bias in our models, we used three alternative measures of the border: segments of 50 km from any port of entry side by side, the whole border (Department of Homeland Security 2017), and all the ports of entry (US Customs and Border Protection 2019).

#### Table 2.7.1. Mediation Negative Binomial Estimates with Different Border Measures

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Total Deaths | Total Deaths | Total Deaths | Total Deaths | Total Deaths |
| *Violence* |  |  |  |  |  |
| Distance to Closest Border Segment (100 km, logged) | 0.663\*\*\* |  |  |  |  |
|  | (0.016) |  |  |  |  |
| Distance to Closest Border Segment (50 km, logged) |  | 0.663\*\*\* |  |  |  |
|  |  | (0.016) |  |  |  |
| Distance to US order (logged) |  |  | 0.680\*\*\* |  |  |
|  |  |  | (0.015) |  |  |
| Distance to Closest Entry Port (logged) |  |  |  | 0.610\*\*\* |  |
|  |  |  |  | (0.017) |  |
| Distance to Closest Port Closest to Highways (logged) |  |  |  |  | 0.675\*\*\* |
|  |  |  |  |  | (0.015) |
| Number of DTOs | 5.685\*\*\* | 5.685\*\*\* | 5.709\*\*\* | 5.660\*\*\* | 5.701\*\*\* |
|  | (0.398) | (0.398) | (0.400) | (0.396) | (0.400) |
| Total Deaths (t-1) | 1.020\*\* | 1.020\*\* | 1.021\*\* | 1.020\* | 1.020\*\* |
|  | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Constant | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* | 0.002\*\*\* | 0.001\*\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.001) | (0.000) |
| *Number of DTOs* |  |  |  |  |  |
| Distance to Closest Border Segment (100 km, logged) | 0.706\*\*\* |  |  |  |  |
|  | (0.025) |  |  |  |  |
| Distance to Closest Border Segment (50 km, logged) |  | 0.706\*\*\* |  |  |  |
|  |  | (0.025) |  |  |  |
| Distance to US Border (logged) |  |  | 0.712\*\*\* |  |  |
|  |  |  | (0.024) |  |  |
| Distance to Closest Entry Port (logged) |  |  |  | 0.662\*\*\* |  |
|  |  |  |  | (0.027) |  |
| Distance to Closest Port Closest to Highways (logged) |  |  |  |  | 0.709\*\*\* |
|  |  |  |  |  | (0.024) |
| Constant | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |
| Log likelihood | -25329.709 | -25329.709 | -25331.370 | -25318.019 | -25329.397 |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Controls | Yes | Yes | Yes | Yes | Yes |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

After these estimations, our results remain equal: with any measure of the border, closer localities have significantly more violence either because of more DTOs or because of other mechanisms. Interestingly, however, the magnitudes of these effects are not homogenous. For instance, localities closer to ports of entry have 51% more deaths (IRR=0.489) because of more DTOs and around 40% (IRR=0.610) more deaths because of other mechanisms. In contrast, for each additional kilometer localities closer to segments of the border or the whole border have, on average, around 45% more deaths because of more DTOs and 34% more deaths because of other mechanisms. In other words, the closeness to the very ports of entry seem to have a higher effect through both mechanisms than whole segments of the border.

#### Table 2.7.2. Mediation Negative Binomial Estimates with Different Border Measures

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Inter DTO Violence | Inter DTO Violence | Inter DTO Violence | Inter DTO Violence | Inter DTO Violence |
| *Violence* |  |  |  |  |  |
| Distance to Closest Border Segment (100 km, logged) | 0.718\*\*\* |  |  |  |  |
|  | (0.017) |  |  |  |  |
| Distance to Closest Border Segment (50 km, logged) |  | 0.718\*\*\* |  |  |  |
|  |  | (0.017) |  |  |  |
| Distance to US Border (logged) |  |  | 0.730\*\*\* |  |  |
|  |  |  | (0.017) |  |  |
| Distance to Closest Entry Port (logged) |  |  |  | 0.673\*\*\* |  |
|  |  |  |  | (0.019) |  |
| Distance to Closest Port Closest to Highways (logged) |  |  |  |  | 0.727\*\*\* |
|  |  |  |  |  | (0.017) |
| Number of DTOs | 5.630\*\*\* | 5.630\*\*\* | 5.649\*\*\* | 5.620\*\*\* | 5.642\*\*\* |
|  | (0.377) | (0.377) | (0.379) | (0.376) | (0.378) |
| Inter DTO Killings (t-1) | 1.004 | 1.004 | 1.004 | 1.003 | 1.004 |
|  | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Constant | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| *Number of DTOs* |  |  |  |  |  |
| Distance to Closest Border Segment (100 km, logged) | 0.706\*\*\* |  |  |  |  |
|  | (0.025) |  |  |  |  |
| Distance to Closest Border Segment (50 km, logged) |  | 0.706\*\*\* |  |  |  |
|  |  | (0.025) |  |  |  |
| Distance to US Border (logged) |  |  | 0.712\*\*\* |  |  |
|  |  |  | (0.024) |  |  |
| Distance to Closest Entry Port (logged) |  |  |  | 0.662\*\*\* |  |
|  |  |  |  | (0.027) |  |
| Distance to Closest Port Closest to Highways (logged) |  |  |  |  | 0.709\*\*\* |
|  |  |  |  |  | (0.024) |
| Constant | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* | 0.001\*\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |
| Log likelihood | -23340.728 | -23340.728 | -23341.161 | -23336.315 | -23340.452 |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Controls | Yes | Yes | Yes | Yes | Yes |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 2.7.3. Effects on Total Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Border 100 | Border 50 | Border | Ports of Entry | Ports of Entry Closest to Highways |
| Indirect | 0.546\*\*\* | 0.546\*\*\* | 0.553\*\*\* | 0.489\*\*\* | 0.550\*\*\* |
|  | (0.036) | (0.036) | (0.035) | (0.038) | (0.035) |
| Direct | 0.663\*\*\* | 0.663\*\*\* | 0.680\*\*\* | 0.610\*\*\* | 0.675\*\*\* |
|  | (0.016) | (0.016) | (0.015) | (0.017) | (0.015) |
| Total | 0.362\*\*\* | 0.362\*\*\* | 0.376\*\*\* | 0.298\*\*\* | 0.371\*\*\* |
|  | (0.025) | (0.025) | (0.025) | (0.024) | (0.025) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 2.7.4. Effects on Inter DTO Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Border 100 | Border 50 | Border | Ports of Entry | Ports of Entry Closest to Highways |
| Indirect | 0.547\*\*\* | 0.547\*\*\* | 0.555\*\*\* | 0.490\*\*\* | 0.552\*\*\* |
|  | (0.035) | (0.035) | (0.034) | (0.038) | (0.034) |
| Direct | 0.718\*\*\* | 0.718\*\*\* | 0.730\*\*\* | 0.673\*\*\* | 0.727\*\*\* |
|  | (0.017) | (0.017) | (0.017) | (0.019) | (0.017) |
| Total | 0.393\*\*\* | 0.393\*\*\* | 0.405\*\*\* | 0.330\*\*\* | 0.401\*\*\* |
|  | (0.027) | (0.027) | (0.027) | (0.027) | (0.026) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses; # p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.8 Models with Cross Section Design

In the manuscript, we present results accounting for the temporal variation of the levels of violence by locality. In this appendix, we present evidence that results hold regardless of the use of a cross-sectional design. Instead of counts of deaths by year, the dependent variables are counts of deaths over the entire period (2006–2011). Except for the number of criminal groups and the number of killed criminals in confrontations with the government, the rest of controls are means over the entire period. Standard errors are clustered at the locality level. The tables below show that results are consistent with what we present in the manuscript.

Table 2.8.1. Mediation Negative Binomial Models with Cross Sectional Design

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Deaths | Inter DTO Deaths |
| *Violence* |  |  |
| Distance to Closest Border Segment | −0.548\*\*\* | −0.437\*\*\* |
|  | (0.041) | (0.039) |
| Distance to Closest Pipeline (logged) | 0.229\*\*\* | 0.214\*\*\* |
|  | (0.022) | (0.021) |
| Distance to Closest Port (logged) | −0.172\*\*\* | −0.163\*\*\* |
|  | (0.035) | (0.033) |
| Distance to Closest Airport (logged) | 0.125\*\*\* | 0.096\*\* |
|  | (0.034) | (0.035) |
| Distance to Closest Highway (logged) | 0.041 | 0.043 |
|  | (0.035) | (0.030) |
| Number of DTOs | 1.089\*\*\* | 1.087\*\*\* |
|  | (0.117) | (0.127) |
| Zetas | 0.459\* | 0.377\* |
|  | (0.185) | (0.153) |
| Beltran Leyva | 0.981\*\*\* | 0.939\*\*\* |
|  | (0.164) | (0.156) |
| Sinaloa | 0.862\*\*\* | 0.917\*\*\* |
|  | (0.163) | (0.156) |
| Familia | 0.317\* | 0.323\* |
|  | (0.138) | (0.134) |
| Golfo | −0.598\*\*\* | −0.602\*\*\* |
|  | (0.166) | (0.150) |
| Juárez | 0.736\*\* | 0.981\*\*\* |
|  | (0.230) | (0.225) |
| Tijuana | −0.830\*\*\* | −0.638\*\* |
|  | (0.239) | (0.234) |
| Social Development | −0.639\*\*\* | −0.602\*\*\* |
|  | (0.048) | (0.044) |
| Population (logged) | 0.867\*\*\* | 0.854\*\*\* |
|  | (0.029) | (0.027) |
| Schooling | −0.003 | −0.003 |
|  | (0.003) | (0.003) |
| Party Change | 0.385\*\*\* | 0.455\*\*\* |
|  | (0.096) | (0.093) |
| Constant | −3.993\*\*\* | −4.828\*\*\* |
|  | (0.423) | (0.402) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment | −0.382\*\*\* | −0.382\*\*\* |
|  | (0.045) | (0.045) |
| Distance to Closest Pipeline (logged) | 0.163\*\*\* | 0.163\*\*\* |
|  | (0.036) | (0.036) |
| Distance to Closest Port (logged) | −0.111\* | −0.111\* |
|  | (0.045) | (0.045) |
| Distance to Closest Airport (logged) | −0.168\*\* | −0.168\*\* |
|  | (0.052) | (0.052) |
| Distance to Closest Highway (logged) | 0.014 | 0.014 |
|  | (0.048) | (0.048) |
| Killed DTO Members (logged) | 0.702\*\*\* | 0.702\*\*\* |
|  | (0.081) | (0.081) |
| PAN Mayor | 0.830\*\* | 0.830\*\* |
|  | (0.255) | (0.255) |
| PRI Mayor | 0.769\*\* | 0.769\*\* |
|  | (0.235) | (0.235) |
| PRD Mayor | 1.101\*\*\* | 1.101\*\*\* |
|  | (0.269) | (0.269) |
| PRI Governor | −0.198 | −0.198 |
|  | (0.127) | (0.127) |
| PAN Governor | −0.874\*\*\* | −0.874\*\*\* |
|  | (0.161) | (0.161) |
| Social Development | −0.931\*\*\* | −0.931\*\*\* |
|  | (0.092) | (0.092) |
| Population (logged) | 0.794\*\*\* | 0.794\*\*\* |
|  | (0.036) | (0.036) |
| Schooling | 0.004 | 0.004 |
|  | (0.005) | (0.005) |
| Percent of Occupied Male | −0.010 | −0.010 |
|  | (0.006) | (0.006) |
| Opium Suitability Area | 0.008\*\*\* | 0.008\*\*\* |
|  | (0.002) | (0.002) |
| Constant | −4.615\*\*\* | −4.615\*\*\* |
|  | (0.826) | (0.826) |
| Observations | 47203 | 47203 |
| Log Likelihood | −18684.301 | −17222.641 |

Note: Standard errors in parentheses

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 2.8.2. Effects on Total Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.195\*\*\* | 0.660\*\*\* | 0.886\* | 0.833\*\* | 1.015 |
|  | (0.049) | (0.042) | (0.044) | (0.051) | (0.053) |
| Direct | 1.257\*\*\* | 0.578\*\*\* | 0.842\*\*\* | 1.134\*\*\* | 1.042 |
|  | (0.028) | (0.024) | (0.030) | (0.039) | (0.036) |
| Total | 1.502\*\*\* | 0.381\*\*\* | 0.746\*\*\* | 0.944 | 1.058 |
|  | (0.070) | (0.028) | (0.046) | (0.068) | (0.068) |
| Observations | 47203 | 47203 | 47203 | 47203 | 47203 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

Table 2.8.3. Effects on Inter DTO Killings

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.194\*\*\* | 0.661\*\*\* | 0.886\* | 0.833\*\* | 1.015 |
|  | (0.050) | (0.044) | (0.044) | (0.051) | (0.053) |
| Direct | 1.239\*\*\* | 0.646\*\*\* | 0.849\*\*\* | 1.101\*\* | 1.044 |
|  | (0.026) | (0.025) | (0.028) | (0.038) | (0.031) |
| Total | 1.480\*\*\* | 0.427\*\*\* | 0.753\*\*\* | 0.917 | 1.059 |
|  | (0.069) | (0.032) | (0.046) | (0.067) | (0.066) |
| Observations | 47203 | 47203 | 47203 | 47203 | 47203 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.9 Models with Additional Interactions

### 2.9A Refineries and Distance to Oil Pipelines

#### Table 2.9.A.1 Mediation Negative Binomial Models with Interactions Between Refineries and Distance to Oil Pipelines

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Deaths | Inter DTO Deaths |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.411\*\*\* | −0.331\*\*\* |
|  | (0.024) | (0.024) |
| Refinery | −0.451 | −0.383 |
|  | (0.395) | (0.407) |
| Distance to Closest Pipeline (logged) | 0.241\*\*\* | 0.229\*\*\* |
|  | (0.014) | (0.015) |
| Refinery × Distance to Closest Pipeline (logged) | −0.122 | −0.137 |
|  | (0.272) | (0.287) |
| Distance to Closest Port (logged) | −0.109\*\*\* | −0.127\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Airport (logged) | 0.194\*\*\* | 0.181\*\*\* |
|  | (0.024) | (0.024) |
| Distance to Closest Highway (logged) | 0.067\*\*\* | 0.062\*\*\* |
|  | (0.014) | (0.015) |
| Number of DTOs | 1.741\*\*\* | 1.730\*\*\* |
|  | (0.070) | (0.067) |
| Total Deaths (t-1) | 0.020\*\* |  |
|  | (0.008) |  |
| Inter DTO Killings (t-1) |  | 0.004 |
|  |  | (0.008) |
| Constant | −6.783\*\*\* | −7.293\*\*\* |
|  | (0.288) | (0.295) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.349\*\*\* | −0.349\*\*\* |
|  | (0.035) | (0.035) |
| Refinery | 0.101 | 0.101 |
|  | (0.611) | (0.611) |
| Distance to Closest Pipeline (logged) | 0.191\*\*\* | 0.191\*\*\* |
|  | (0.025) | (0.025) |
| Refinery × Distance to Closest Pipeline (logged) | 0.237 | 0.237 |
|  | (0.382) | (0.382) |
| Distance to Closest Port (logged) | −0.105\*\* | −0.105\*\* |
|  | (0.034) | (0.034) |
| Distance to Closest Airport (logged) | −0.064# | −0.064# |
|  | (0.038) | (0.038) |
| Distance to Closest Highway (logged) | 0.026 | 0.026 |
|  | (0.031) | (0.031) |
| Constant | −7.533\*\*\* | −7.533\*\*\* |
|  | (0.491) | (0.491) |
| Observations | 235997 | 235997 |
| Log Likelihood | −25326.631 | −23338.312 |
| Time Fixed Effects | Yes | Yes |
| Controls | Yes | Yes |

Note: Standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.9.A.2. Effects on Total Killings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|  | Distance to Closest Pipeline | Refinery | Refinery × Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.395\*\*\* | 1.192 | 1.511 | 0.545\*\*\* | 0.834\*\* | 0.894# | 1.046 |
|  | (0.064) | (1.268) | (1.006) | (0.036) | (0.050) | (0.059) | (0.056) |
| Direct | 1.273\*\*\* | 0.637 | 0.885 | 0.663\*\*\* | 0.897\*\*\* | 1.214\*\*\* | 1.069\*\*\* |
|  | (0.018) | (0.252) | (0.240) | (0.016) | (0.019) | (0.029) | (0.015) |
| Total | 1.775\*\*\* | 0.759 | 1.337 | 0.361\*\*\* | 0.747\*\*\* | 1.086 | 1.118\* |
|  | (0.085) | (0.862) | (0.961) | (0.025) | (0.048) | (0.076) | (0.062) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.9.A.3. Effects on Inter DTO Killings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|  | Distance to Closest Pipeline | Refinery | Refinery × Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.392\*\*\* | 1.191 | 1.507 | 0.547\*\*\* | 0.834\*\* | 0.895# | 1.045 |
|  | (0.063) | (1.259) | (0.997) | (0.035) | (0.050) | (0.059) | (0.056) |
| Direct | 1.257\*\*\* | 0.682 | 0.872 | 0.718\*\*\* | 0.881\*\*\* | 1.198\*\*\* | 1.064\*\*\* |
|  | (0.019) | (0.277) | (0.250) | (0.017) | (0.019) | (0.029) | (0.016) |
| Total | 1.750\*\*\* | 0.812 | 1.314 | 0.393\*\*\* | 0.735\*\*\* | 1.072 | 1.112# |
|  | (0.084) | (0.919) | (0.948) | (0.027) | (0.047) | (0.075) | (0.062) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

### 2.9B Law Enforcement and Distance to Highways

#### Table 2.9.B.1. Mediation Negative Binomial Models with Interaction between Law Enforcement and Distance to Highways in First Equation

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Deaths | Inter DTO Deaths |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.411\*\*\* | −0.332\*\*\* |
|  | (0.024) | (0.024) |
| Distance to Closest Pipeline (logged) | 0.243\*\*\* | 0.230\*\*\* |
|  | (0.014) | (0.015) |
| Distance to Closest Port (logged) | −0.108\*\*\* | −0.125\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Airport (logged) | 0.192\*\*\* | 0.179\*\*\* |
|  | (0.024) | (0.024) |
| Distance to Closest Highway (logged) | 0.066\*\*\* | 0.061\*\*\* |
|  | (0.014) | (0.015) |
| Number of DTOs | 1.738\*\*\* | 1.728\*\*\* |
|  | (0.070) | (0.067) |
| Total Deaths (t-1) | 0.020\*\* |  |
|  | (0.008) |  |
| Inter DTO Killings (t-1) |  | 0.004 |
|  |  | (0.008) |
| Constant | −6.784\*\*\* | −7.293\*\*\* |
|  | (0.288) | (0.295) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.347\*\*\* | −0.347\*\*\* |
|  | (0.035) | (0.035) |
| Distance to Closest Pipeline (logged) | 0.186\*\*\* | 0.186\*\*\* |
|  | (0.025) | (0.025) |
| Distance to Closest Port (logged) | −0.108\*\* | −0.108\*\* |
|  | (0.034) | (0.034) |
| Distance to Closest Airport (logged) | −0.077\* | −0.077\* |
|  | (0.038) | (0.038) |
| Law Enforcement | 1.276\*\*\* | 1.276\*\*\* |
|  | (0.324) | (0.324) |
| Distance to Closest Highway (logged) | 0.033 | 0.033 |
|  | (0.031) | (0.031) |
| Law Enforcement × Distance to Closest Highway (logged) | −0.591\*\* | −0.591\*\* |
|  | (0.212) | (0.212) |
| Constant | −7.459\*\*\* | −7.459\*\*\* |
|  | (0.488) | (0.488) |
| Observations | 235997 | 235997 |
| Log likelihood | −25320.641 | −23331.661 |
| Time Fixed Effects | Yes | Yes |
| Controls | Yes | Yes |

Note: Standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.9.B.2 Effects on Total Killings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway | Killed DTOs | Killed DTOs × Distance to Closest Highway |
| Indirect | 1.381\*\*\* | 0.548\*\*\* | 0.829\*\* | 0.875\* | 1.059 | 9.181\*\*\* | 0.358\*\* |
|  | (0.062) | (0.035) | (0.049) | (0.057) | (0.058) | (5.241) | (0.132) |
| Direct | 1.275\*\*\* | 0.663\*\*\* | 0.898\*\*\* | 1.212\*\*\* | 1.068\*\*\* |  |  |
|  | (0.018) | (0.016) | (0.019) | (0.029) | (0.015) |  |  |
| Total | 1.762\*\*\* | 0.363\*\*\* | 0.744\*\*\* | 1.060 | 1.131\* |  |  |
|  | (0.083) | (0.025) | (0.047) | (0.074) | (0.064) |  |  |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.9.B.3 Effects on Inter DTO Killings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway | Killed DTOs | Killed DTOS × Distance to Closest Highway |
| Indirect | 1.378\*\*\* | 0.550\*\*\* | 0.830\*\* | 0.876\* | 1.058 | 9.035\*\*\* | 0.360\*\* |
|  | (0.062) | (0.035) | (0.049) | (0.057) | (0.057) | (5.115) | (0.132) |
| Direct | 1.258\*\*\* | 0.718\*\*\* | 0.882\*\*\* | 1.195\*\*\* | 1.063\*\*\* |  |  |
|  | (0.019) | (0.017) | (0.019) | (0.029) | (0.016) |  |  |
| Total | 1.733\*\*\* | 0.395\*\*\* | 0.732\*\*\* | 1.046 | 1.124\* |  |  |
|  | (0.082) | (0.027) | (0.046) | (0.073) | (0.063) |  |  |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

#### Table 2.9.B.4. Mediation Negative Binomial Models with Interaction between Law Enforcement and Distance to Highways in Both Equations

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Deaths | Inter DTO Deaths |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.413\*\*\* | −0.331\*\*\* |
|  | (0.023) | (0.024) |
| Distance to Closest Pipeline (logged) | 0.241\*\*\* | 0.228\*\*\* |
|  | (0.014) | (0.015) |
| Distance to Closest Port (logged) | −0.110\*\*\* | −0.127\*\*\* |
|  | (0.021) | (0.022) |
| Distance to Closest Airport (logged) | 0.188\*\*\* | 0.173\*\*\* |
|  | (0.024) | (0.024) |
| Murdered DTOs | 1.215\*\*\* | 1.008\*\*\* |
|  | (0.197) | (0.182) |
| Distance to Closest Highway (logged) | 0.064\*\*\* | 0.058\*\*\* |
|  | (0.014) | (0.015) |
| Murdered DTOs × Distance to Closest Highway | −0.092 | 0.069 |
|  | (0.155) | (0.155) |
| Number of DTOs | 1.735\*\*\* | 1.721\*\*\* |
|  | (0.069) | (0.067) |
| Total Deaths (t-1) | −0.003 |  |
|  | (0.007) |  |
| Inter DTO Killings (t-1) |  | −0.008\*\*\* |
|  |  | (0.003) |
| Constant | −6.737\*\*\* | −7.241\*\*\* |
|  | (0.286) | (0.294) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.347\*\*\* | −0.347\*\*\* |
|  | (0.035) | (0.035) |
| Distance to Closest Pipeline (logged) | 0.186\*\*\* | 0.186\*\*\* |
|  | (0.025) | (0.025) |
| Distance to Closest Port (logged) | −0.108\*\* | −0.108\*\* |
|  | (0.034) | (0.034) |
| Distance to Closest Airport (logged) | −0.077\* | −0.077\* |
|  | (0.038) | (0.038) |
| Murdered DTOs | 1.276\*\*\* | 1.276\*\*\* |
|  | (0.324) | (0.324) |
| Distance to Closest Highway (logged) | 0.033 | 0.033 |
|  | (0.031) | (0.031) |
| Murdered DTOs × Distance to Closest Highway | −0.591\*\* | −0.591\*\* |
|  | (0.212) | (0.212) |
| Constant | −7.459\*\*\* | −7.459\*\*\* |
|  | (0.488) | (0.488) |
| Observations | 235997 | 235997 |
| Log likelihood | −25297.568 | −23310.886 |
| Time Fixed Effects | Yes | Yes |
| Controls | Yes | Yes |

Note: Standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.9.B.5. Effects on Total Murders

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway | Murdered DTOs | Murdered DTOs × Distance to Closest Highway |
| Indirect | 1.380\*\*\* | 0.548\*\*\* | 0.829\*\* | 0.875\* | 1.058 | 9.150\*\*\* | 0.358\*\* |
|  | (0.062) | (0.035) | (0.049) | (0.057) | (0.058) | (5.214) | (0.132) |
| Direct | 1.273\*\*\* | 0.662\*\*\* | 0.896\*\*\* | 1.207\*\*\* | 1.067\*\*\* | 3.371\*\*\* | 0.913 |
|  | (0.018) | (0.016) | (0.019) | (0.028) | (0.015) | (0.664) | (0.141) |
| Total | 1.757\*\*\* | 0.363\*\*\* | 0.743\*\*\* | 1.056 | 1.129\* | 30.846\*\*\* | 0.327\*\* |
|  | (0.083) | (0.025) | (0.047) | (0.073) | (0.063) | (18.605) | (0.131) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.9.B.6. Effects on Inter DTO Murders

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway | Killed DTOs | Killed DTOs × Distance to Closest Highway |
| Indirect | 1.377\*\*\* | 0.551\*\*\* | 0.830\*\* | 0.876\* | 1.058 | 8.986\*\*\* | 0.361\*\* |
|  | (0.061) | (0.035) | (0.049) | (0.057) | (0.057) | (5.074) | (0.132) |
| Direct | 1.256\*\*\* | 0.718\*\*\* | 0.881\*\*\* | 1.189\*\*\* | 1.059\*\*\* | 2.823\*\*\* | 1.069 |
|  | (0.019) | (0.017) | (0.019) | (0.029) | (0.016) | (0.517) | (0.165) |
| Total | 1.730\*\*\* | 0.395\*\*\* | 0.732\*\*\* | 1.042 | 1.121\* | 25.371\*\*\* | 0.386\* |
|  | (0.081) | (0.027) | (0.046) | (0.072) | (0.063) | (15.064) | (0.154) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

## 2.10 Models with Urban Indicators

This first set of models considers urban localities as those that have at least 2,500 inhabitants or whether they were the main population center of the municipality (*cabecera municipal*) following INEGI’s criteria.

#### Table 2.10.A.1 Mediation Negative Binomial Models with Urban Binary Indicator (INEGI criteria)

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Deaths | Inter DTO Deaths |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.384\*\*\* | −0.323\*\*\* |
|  | (0.023) | (0.024) |
| Distance to Closest Pipeline (logged) | 0.223\*\*\* | 0.217\*\*\* |
|  | (0.014) | (0.015) |
| Distance to Closest Port (logged) | −0.129\*\*\* | −0.141\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Airport (logged) | 0.134\*\*\* | 0.129\*\*\* |
|  | (0.023) | (0.023) |
| Distance to Closest Highway (logged) | 0.031\* | 0.030# |
|  | (0.015) | (0.015) |
| Number of DTOs | 1.636\*\*\* | 1.627\*\*\* |
|  | (0.069) | (0.066) |
| Total Deaths (t-1) | 0.013\* |  |
|  | (0.006) |  |
| Urban | 1.399\*\*\* | 1.215\*\*\* |
|  | (0.059) | (0.061) |
| Inter DTO Killings (t-1) |  | 0.003 |
|  |  | (0.007) |
| Constant | −5.555\*\*\* | −6.160\*\*\* |
|  | (0.287) | (0.296) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.345\*\*\* | −0.345\*\*\* |
|  | (0.035) | (0.035) |
| Distance to Closest Pipeline (logged) | 0.180\*\*\* | 0.180\*\*\* |
|  | (0.025) | (0.025) |
| Distance to Closest Port (logged) | −0.109\*\* | −0.109\*\* |
|  | (0.034) | (0.034) |
| Distance to Closest Airport (logged) | −0.091\* | −0.091\* |
|  | (0.037) | (0.037) |
| Distance to Closest Highway (logged) | 0.008 | 0.008 |
|  | (0.032) | (0.032) |
| Urban | 0.700\*\*\* | 0.700\*\*\* |
|  | (0.109) | (0.109) |
| Constant | −6.979\*\*\* | −6.979\*\*\* |
|  | (0.495) | (0.495) |
| Observations | 235997 | 235997 |
| Log Likelihood | −25027.511 | −23124.031 |
| Time Fixed Effects | Yes | Yes |
| Controls | Yes | Yes |

Note: Standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.10.A.2. Effects on Total Murders

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.343\*\*\* | 0.569\*\*\* | 0.836\*\* | 0.861\* | 1.013 |
|  | (0.057) | (0.035) | (0.047) | (0.053) | (0.053) |
| Direct | 1.250\*\*\* | 0.681\*\*\* | 0.879\*\*\* | 1.143\*\*\* | 1.031\* |
|  | (0.018) | (0.016) | (0.019) | (0.026) | (0.015) |
| Total | 1.678\*\*\* | 0.388\*\*\* | 0.735\*\*\* | 0.984 | 1.044 |
|  | (0.075) | (0.025) | (0.044) | (0.064) | (0.057) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.10.A.3. Effects on Inter DTO Murders

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.341\*\*\* | 0.570\*\*\* | 0.837\*\* | 0.862\* | 1.013 |
|  | (0.056) | (0.035) | (0.046) | (0.053) | (0.053) |
| Direct | 1.242\*\*\* | 0.724\*\*\* | 0.868\*\*\* | 1.138\*\*\* | 1.030# |
|  | (0.018) | (0.017) | (0.019) | (0.027) | (0.016) |
| Total | 1.665\*\*\* | 0.413\*\*\* | 0.727\*\*\* | 0.981 | 1.043 |
|  | (0.074) | (0.027) | (0.043) | (0.064) | (0.056) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

This set of models identifies urban localities as those that have a population greater than or equal to 2500 inhabitants regardless of whether they were municipal main population centers.

#### Table 2.10.B.1. Mediation Negative Binomial Models with Urban Binary Indicator (Population criterion)

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | Total Deaths | Inter DTO Deaths |
| *Violence* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.411\*\*\* | −0.330\*\*\* |
|  | (0.024) | (0.024) |
| Distance to Closest Pipeline (logged) | 0.246\*\*\* | 0.232\*\*\* |
|  | (0.014) | (0.015) |
| Distance to Closest Port (logged) | −0.107\*\*\* | −0.124\*\*\* |
|  | (0.022) | (0.022) |
| Distance to Closest Airport (logged) | 0.184\*\*\* | 0.169\*\*\* |
|  | (0.023) | (0.024) |
| Distance to Closest Highway (logged) | 0.057\*\*\* | 0.054\*\*\* |
|  | (0.014) | (0.015) |
| Number of DTOs | 1.727\*\*\* | 1.720\*\*\* |
|  | (0.070) | (0.066) |
| Total Deaths (t-1) | 0.019\* |  |
|  | (0.007) |  |
| Urban | 0.414\*\*\* | 0.381\*\*\* |
|  | (0.064) | (0.066) |
| Inter DTO Murders (t-1) |  | 0.004 |
|  |  | (0.008) |
| Constant | −6.279\*\*\* | −6.840\*\*\* |
|  | (0.297) | (0.304) |
| *Number of DTOs* |  |  |
| Distance to Closest Border Segment (100 km, logged) | −0.349\*\*\* | −0.349\*\*\* |
|  | (0.035) | (0.035) |
| Distance to Closest Pipeline (logged) | 0.189\*\*\* | 0.189\*\*\* |
|  | (0.025) | (0.025) |
| Distance to Closest Port (logged) | −0.104\*\* | −0.104\*\* |
|  | (0.034) | (0.034) |
| Distance to Closest Airport (logged) | −0.069# | −0.069# |
|  | (0.038) | (0.038) |
| Distance to Closest Highway (logged) | 0.024 | 0.024 |
|  | (0.031) | (0.031) |
| Urban | 0.222# | 0.222# |
|  | (0.117) | (0.117) |
| Constant | −7.303\*\*\* | −7.303\*\*\* |
|  | (0.503) | (0.503) |
| Observations | 235997 | 235997 |
| Log Likelihood | −25307.147 | −23322.213 |
| Time Fixed Effects | Yes | Yes |
| Controls | Yes | Yes |

Note: Standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.10.B.2. Effects on Total Murders

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.351\*\*\* | 0.555\*\*\* | 0.818\*\*\* | 0.852\* | 1.003 |
|  | (0.060) | (0.036) | (0.048) | (0.055) | (0.055) |
| Direct | 1.279\*\*\* | 0.663\*\*\* | 0.899\*\*\* | 1.202\*\*\* | 1.059\*\*\* |
|  | (0.018) | (0.016) | (0.019) | (0.028) | (0.015) |
| Total | 1.727\*\*\* | 0.368\*\*\* | 0.735\*\*\* | 1.025 | 1.062 |
|  | (0.081) | (0.025) | (0.046) | (0.071) | (0.061) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

#### Table 2.10B.3. Effects on Inter DTO Murders

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
|  | Distance to Closest Pipeline | Distance to US Border | Distance to Closest Port | Distance to Closest Airport | Distance to Closest Highway |
| Indirect | 1.385\*\*\* | 0.548\*\*\* | 0.836\*\* | 0.888# | 1.042 |
|  | (0.062) | (0.035) | (0.049) | (0.058) | (0.056) |
| Direct | 1.261\*\*\* | 0.719\*\*\* | 0.884\*\*\* | 1.184\*\*\* | 1.055\*\*\* |
|  | (0.019) | (0.017) | (0.019) | (0.028) | (0.016) |
| Total | 1.746\*\*\* | 0.394\*\*\* | 0.739\*\*\* | 1.052 | 1.099# |
|  | (0.082) | (0.027) | (0.046) | (0.073) | (0.061) |
| Observations | 235997 | 235997 | 235997 | 235997 | 235997 |

Note: Exponentiated coefficients; standard errors in parentheses;

# p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

# Appendix 3. Additional Predicted Effects

Figure 3.1. Predicted Mean of Killings in Localities in the Fifth Percentile of Population

A graph of a number of people

Description automatically generated with medium confidence

A graph of a line graph

Description automatically generated with medium confidence

Figure 3.2. Predicted Mean of Killings in Localities in the Ninety-Fifth Percentile of Population

A graph of a number of people

Description automatically generated with medium confidence

A graph with lines and dots

Description automatically generated