Annex B: State Size and Democracy
Robustness Check: Freedom House 14-point Index as Dependent Variable

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1 Introduction

In this annex, the dependent variable in the following models have been substituted with the 14-point Freedom House democracy scores.

2 Empirical Strategy 1: Regression

Table B1: Relationship between Logged Population and Democracy (Freedom House Index)

	fh_total_reversed					
	Exposure-Outcome, Pooled			Pooled (No Interaction)	Panel FE (No Interaction)	Pooled (Interaction)
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Population (Logged)	0.1136	0.1072	0.0259	0.0250	1.5536***	0.1530
	(0.0602)	(0.0561)	(0.0527)	(0.0501)	(0.5081)	(0.1840)
	p = 0.0590	p = 0.0563	p = 0.6233	p = 0.6184	p = 0.0023	p = 0.4059
Clientelism		−5.0229***		−3.9785***	−6.2735***	−5.6409***
		(1.1836)		(0.9932)	(1.1623)	(1.5726)
		p = 0.00003		p = 0.0001	p = 0.0000001	p = 0.0004
Military Participation Rate			−0.2611***	−0.2487***	−0.0479	−0.1876*
			(0.0263)	(0.0256)	(0.0254)	(0.0901)
			p = 0.0000	p = 0.0000	p = 0.0601	p = 0.0373
Urbanisation (% of Population)	−6.5665***	−5.6761***	−3.8367***	−3.2615***	9.1325***	−1.5076
	(0.9144)	(0.8929)	(0.8258)	(0.8080)	(1.5456)	(3.1028)
	p = 0.0000	p = 0.0000	p = 0.000004	p = 0.0001	p = 0.0000	p = 0.6271
Per Capita GDP (Logged)	2.1756***	1.0752***	2.0479***	1.1824***	0.5058	1.2062***
	(0.2314)	(0.3210)	(0.2210)	(0.2990)	(0.3136)	(0.3094)
	p = 0.0000	p = 0.0009	p = 0.0000	p = 0.0001	p = 0.1068	p = 0.0001
Government Expenditure (% of GDP)	−0.7674	−2.0446	−1.5229	−2.4985	−0.1929	−2.6108
	(2.5487)	(2.5426)	(2.3503)	(2.3899)	(1.9120)	(2.5276)
	p = 0.7634	p = 0.4214	p = 0.5171	p = 0.2959	p = 0.9197	p = 0.3017
Foreign Aid Received (% of GNI)	−0.9304	−3.7332	−1.0842	−3.2968	−3.0260	−1.6073
	(3.1271)	(2.9799)	(2.9254)	(2.8669)	(2.0719)	(3.3861)
	p = 0.7661	p = 0.2103	p = 0.7110	p = 0.2502	p = 0.1442	p = 0.6351
Resource Dependence	0.0007	0.0436*	−0.0146	0.0201	0.0181	0.0323
	(0.0174)	(0.0222)	(0.0149)	(0.0194)	(0.0154)	(0.0208)
	p = 0.9690	p = 0.0493	p = 0.3272	p = 0.3005	p = 0.2383	p = 0.1206
Ethnic Fractionalization	−2.4781***	−3.4866***	−1.5439*	−2.3873***		−2.5773***
	(0.8160)	(0.8393)	(0.7815)	(0.8150)		(0.7918)
	p = 0.0024	p = 0.00004	p = 0.0482	p = 0.0035		p = 0.0012
Islamic	−3.1879***	−3.4227***	−3.0348***	−3.2280***		−3.4277***
	(0.6200)	(0.6030)	(0.5564)	(0.5438)		(0.5712)
	p = 0.0000003	p = 0.0000	p = 0.0000001	p = 0.0000		p = 0.0000
Population × Urbanization						−0.1691
						(0.2527)
						p = 0.5034
Clientelism × Urbanization						2.9664
						(2.4409)
						p = 0.2243
MPR × Urbanization						−0.0882
						(0.1108)
						p = 0.4259
Constant	−7.0966***	4.4395	−5.3170*	3.7355	1.2256***	2.2088
	(2.3798)	(3.5001)	(2.2676)	(3.2620)	(0.3878)	(4.3939)
	p = 0.0029	p = 0.2047	p = 0.0191	p = 0.2522	p = 0.0016	p = 0.6152
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	Yes	No
N	1204	1204	1204	1204	1204	1204
R-squared	0.4582	0.4891	0.5702	0.5893	0.2294	0.5923
Adj. R-squared	0.4322	0.4641	0.5492	0.5689	0.1738	0.5709
Residual Std. Error	2.6576 (df = 1148)	2.5819 (df = 1147)	2.3681 (df = 1147)	2.3159 (df = 1146)	1.2518 (df = 1122)	2.3104 (df = 1143)
F Statistic	17.6519*** (df = 55; 1148)	19.6043*** (df = 56; 1147)	27.1714*** (df = 56; 1147)	28.8469*** (df = 57; 1146)	4.1243*** (df = 81; 1122)	27.6752*** (df = 60; 1143)

***p < .005; **p < .01; *p < .05

Table B2: Relationship between Logged Population and Military Participation Rate (Table 4 in thesis)

	milrate		
	Pooled (No Interaction)	**Panel FE (No Interaction)**	**Pooled (Interaction)**
	Model 1	**Model 2**	**Model 3**
Population (Logged)	−0.3305***	−1.7195	−0.2679
	(0.1000)	(1.3326)	(0.3886)
	p = 0.0010	p = 0.1970	p = 0.4906
Clientelism	4.2004*	12.7981***	0.0759
	(2.1143)	(2.6913)	(2.5810)
	p = 0.0470	p = 0.000002	p = 0.9766
Urbanisation (% of Population)	9.7101***	−1.4779	7.2152
	(1.5506)	(2.8998)	(7.8527)
	p = 0.0000	p = 0.6103	p = 0.3582
Per Capita GDP (Logged)	0.4310	0.8398	0.3736
	(0.4574)	(0.8576)	(0.4874)
	p = 0.3461	p = 0.3275	p = 0.4434
Government Expenditure (% of GDP)	−1.8253	1.2144	−2.1592
	(3.8432)	(2.4228)	(3.9420)
	p = 0.6349	p = 0.6163	p = 0.5839
Foreign Aid Received (% of GNI)	1.7549	0.0398	2.6850
	(4.2458)	(3.7915)	(4.0212)
	p = 0.6794	p = 0.9917	p = 0.5044
Resource Dependence	−0.0945**	−0.0900*	−0.0665
	(0.0342)	(0.0359)	(0.0358)
	p = 0.0058	p = 0.0123	p = 0.0633
Ethnic Fractionalization	4.4211***		3.8826***
	(1.2785)		(1.3140)
	p = 0.0006		p = 0.0032
Islamic	0.7829		0.4534
	(0.6123)		(0.6232)
	p = 0.2011		p = 0.4669
Population × Urbanization			−0.0077
			(0.5930)
			p = 0.9897
Clientelism × Urbanization			7.0402
			(4.3189)
			p = 0.1031
Constant	−2.8311	−0.9380	−1.2374
	(5.6621)	(0.9149)	(8.3839)
	p = 0.6171	p = 0.3053	p = 0.8827
Year FE	Yes	Yes	Yes
Country FE	No	Yes	No
N	1204	1204	1204
R-squared	0.2563	0.1866	0.2611
Adj. R-squared	0.2200	0.1287	0.2237
Residual Std. Error	4.5989 (df = 1147)	2.8467 (df = 1123)	4.5882 (df = 1145)
F Statistic	7.0602*** (df = 56; 1147)	3.2203*** (df = 80; 1123)	6.9753*** (df = 58; 1145)

***p < .005; **p < .01; *p < .05

Table B3: Relationship between Logged Population and Clientelism (Table 3 in thesis)

	v2xnp_client		
	Pooled (No Interaction)	**Panel FE (No Interaction)**	**Pooled (Interaction)**
	Model 1	**Model 2**	**Model 3**
Population (Logged)	−0.0002	0.1660***	−0.0349***
	(0.0026)	(0.0298)	(0.0114)
	p = 0.9284	p = 0.0000001	p = 0.0023
Military Participation Rate	0.0031*	0.0050***	0.0084
	(0.0014)	(0.0009)	(0.0044)
	p = 0.0244	p = 0.0000002	p = 0.0558
Urbanisation (% of Population)	0.1446***	0.0701	−0.5869***
	(0.0442)	(0.0595)	(0.2019)
	p = 0.0011	p = 0.2386	p = 0.0037
Per Capita GDP (Logged)	−0.2175***	−0.0531***	−0.2345***
	(0.0091)	(0.0127)	(0.0118)
	p = 0.0000	p = 0.00003	p = 0.0000
Government Expenditure (% of GDP)	−0.2452***	−0.5217***	−0.3376***
	(0.0809)	(0.1161)	(0.0898)
	p = 0.0025	p = 0.00001	p = 0.0002
Foreign Aid Received (% of GNI)	−0.5562***	−0.0595	−0.7069***
	(0.1770)	(0.1350)	(0.1967)
	p = 0.0017	p = 0.6596	p = 0.0004
Resource Dependence	0.0087***	0.0002	0.0096***
	(0.0011)	(0.0011)	(0.0012)
	p = 0.0000	p = 0.8443	p = 0.0000
Ethnic Fractionalization	−0.2120***		−0.2058***
	(0.0268)		(0.0277)
	p = 0.0000		p = 0.0000
Islamic	−0.0486		−0.0370
	(0.0288)		(0.0265)
	p = 0.0916		p = 0.1628
Population × Urbanization			0.0544***
			(0.0160)
			p = 0.0007
MPR × Urbanization			−0.0076
			(0.0056)
			p = 0.1780
Constant	2.2754***	0.0386*	2.9128***
	(0.0911)	(0.0169)	(0.2389)
	p = 0.0000	p = 0.0220	p = 0.0000
Year FE	Yes	Yes	Yes
Country FE	No	Yes	No
N	1204	1204	1204
R-squared	0.7688	0.5041	0.7756
Adj. R-squared	0.7575	0.4688	0.7642
Residual Std. Error	0.1255 (df = 1147)	0.0565 (df = 1123)	0.1237 (df = 1145)
F Statistic	68.1109*** (df = 56; 1147)	14.2699*** (df = 80; 1123)	68.2216*** (df = 58; 1145)

***p < .005; **p < .01; *p < .05

3 Empirical Strategy 2: Causal Mediation Analysis

3.1 H_2: The long-term operation of clientelism

Figure B1 shows the effect of state size (population) on democracy which is operated by clientelism, denoted by the ACME. As the ACME is not significant, we cannot reject the null hypothesis that the effect of population size on democracy is not operated by clientelism. We will return to this in section 3.3 on the conditional operation of clientelism since I suspect heterogeneity in the ACME conditioned by the urban share of the population. We recall from the thesis that the urban share of the population

is meant to measure the spread of the population (as opposed to population density). This indicator gives us a much more direct approximation of how much of the population is clustered in urban centres.

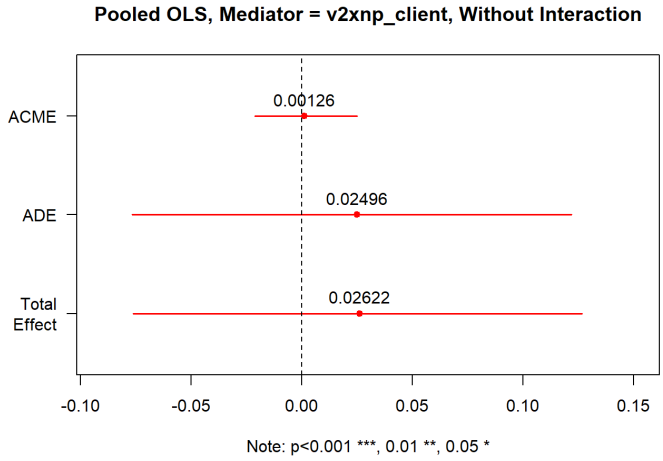

Figure B1: Long-term operation of clientelism.

3.2 H_{2a}: The short-term operation of clientelism

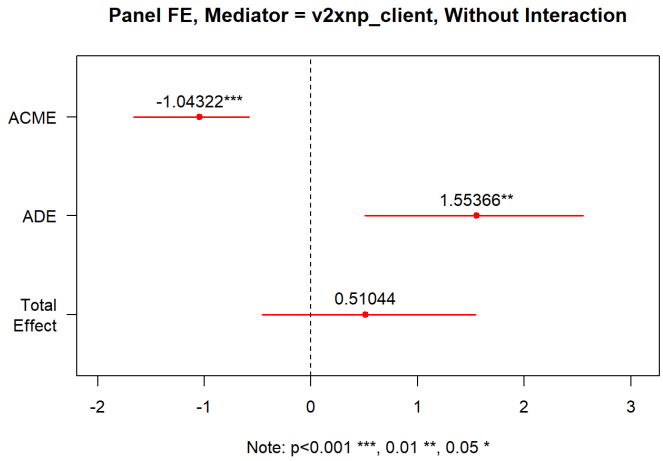

Figure B2: Short-term operation of clientelism.

Figure B2 shows the short-term effect of state size (population) on democracy which is operated by clientelism, denoted by the ACME. Since ACME $= -1.04322$ and is significant at the 0.001 level, we can reject the null hypothesis.

What is surprising about this result, as with the thesis, is that the ACME is negative. Furthermore, Model 2 of Table B3 also show a positive and significant relationship between population size and clientelism year-on-year. This means that as states experience population growth year-on-year, they are likely to experience higher levels of democracy because clientelism becomes more prevalent with population growth. The occurrence of this result may be due to a long-term effect of clientelism, where states that experience prior levels of clientelism are more likely to retain their clientelistic linkages, even if they grow to a larger size in the future. Further future research should be conducted to verify the institutional legacies of clientelism, where such institutional legacies may mirror the kind of patronage uncovered and explained in Poczter and Pepinsky (2016).

3.3 H_{2b}: The conditional operation of clientelism

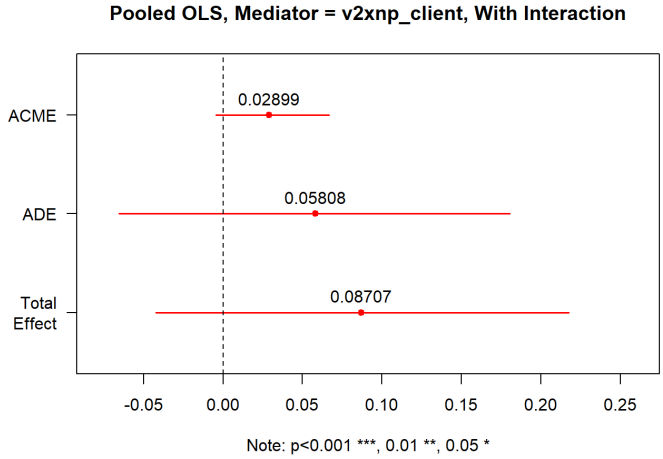

Figure B3: Conditional operation of clientelism.

From Figure B3, there does not seem, at first glance, to be any evidence of the effect of population size on democracy being operated by clientelism. However, further inspecting the model by modelling the less urban sample and the more urban sample yields the following observations. First, with an ACME of 0.09178 among the less urban states and an ACME of -0.03253 among more urban states, significant at the 0.01 level, we can conclude that there is heterogeneity in the operation of clientelism.

Turning first to the less urban states (see Fig. B4), we observe a positive and significant ACME. This ACME informs us that for every 10% increase in population size, the Freedom House democracy score is expected to increase, on average, by 0.00875. Turning to the more urban states (see Fig. B5), however, we observe a reversal in the relationship; for every 10% increase in population size, the Freedom House democracy score is expected to decrease, on average, by 0.00310. This may indicate that less urban states with larger populations place resource strains on clientelistic linkages, thereby diminishing the undemocratic effects of clientelism and increasing the levels of democracy as a result. Conversely, in more urban states, an increase in population size may, instead, prompt higher levels of clientelism since political elites are able to leverage on efficient clientelistic linkages bankrolled and driven by economies of scale. A further explanation is given in Chapter 5 of the thesis.

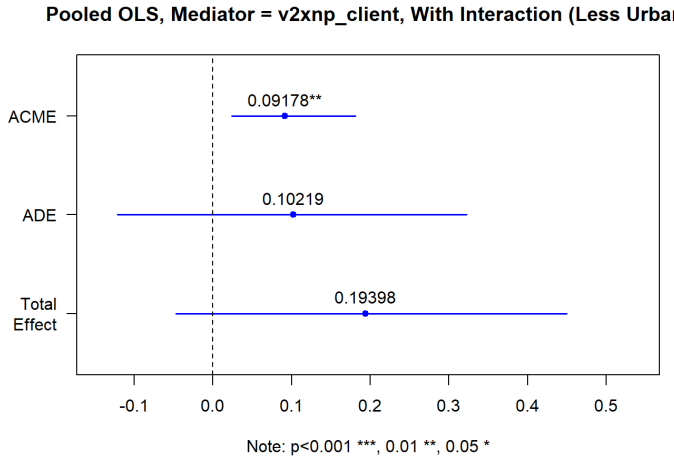

Figure B4: Conditional operation of clientelism in less urban states.

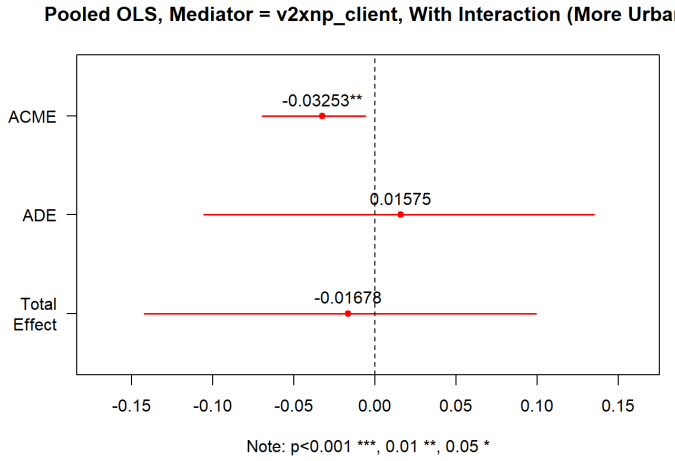

Figure B5: Conditional operation of clientelism in more urban states.

3.4 H_3: The long-term operation of coercive capacity

Figure B6 shows the effect of population size on democracy which is operated by coercive capacity, measured using the number of military personnel per 1000 people (alternatively termed military participation rate), denoted by the ACME. The ACME is positive at 0.08269, significant at the 0.01 level. This means that for every 10% increase in population size, the Freedom House democracy score increases by 0.00788, with this effect being operated by military participation rate. Furthermore, Model 1 of Table B2 shows a negative and significant relationship between population size and military participation rate. We can thus reject the null hypothesis and conclude that there is an effect of population size on democracy that is being operated by coercive capacity. That is, smaller states, being more likely to possess larger coercive capacities relative to their population size, are likely to have lower levels of democracy.

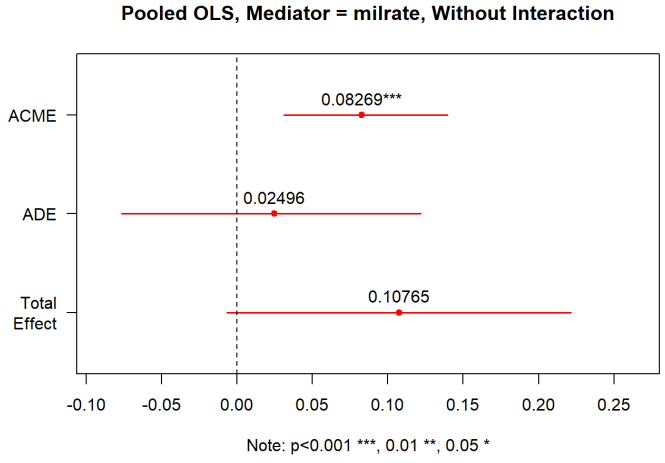

Figure B6: Long-term operation of coercive capacity.

3.5 H_{3a}: The short-term operation of coercive capacity

Figure B7 shows the short-term effect of population size on democracy which is operated by coercive capacity, denoted by the ACME. The ACME is, however, not significant. We cannot reject the null hypothesis that there is no operation of the effect of population size on democracy through coercive capacity on the short term. The potential explanation for this has been detailed in Chapter 5 of the thesis.

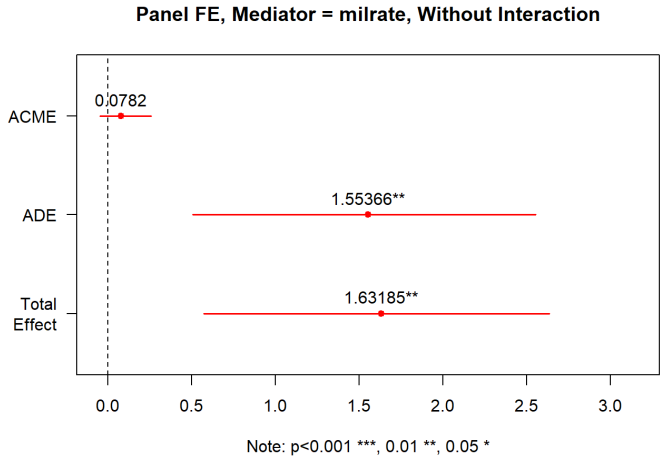

Figure B7: Short-term operation of coercive capacity.

3.6 H_{3b}: The conditional operation of coercive capacity

The ACME in Figure B8 shows a similar result with the ACME in Figure B6. However, there does not seem to be any difference among less urban and more urban states. This overturns our initial expectations that more urban states are likely to experience a stronger effect of population size on democracy.

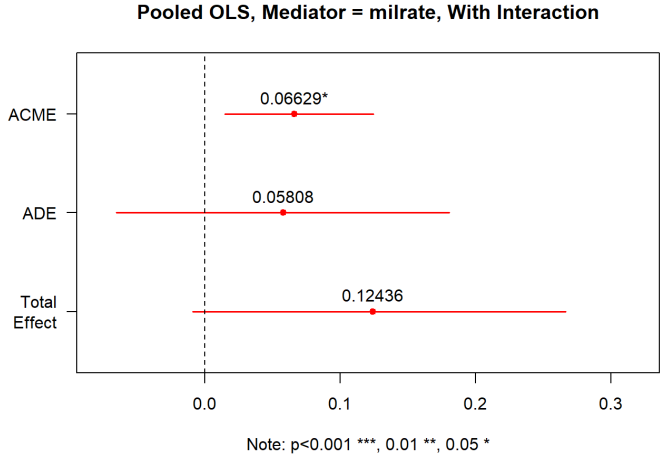

Figure B8: Conditional operation of coercive capacity.

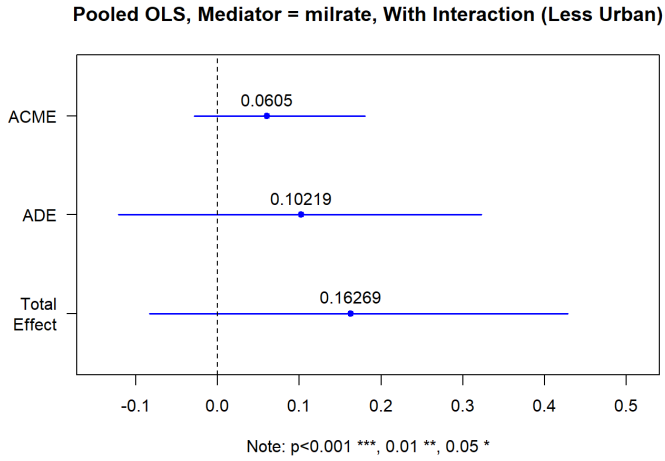

Figure B9: Conditional operation of coercive capacity inless urban states.

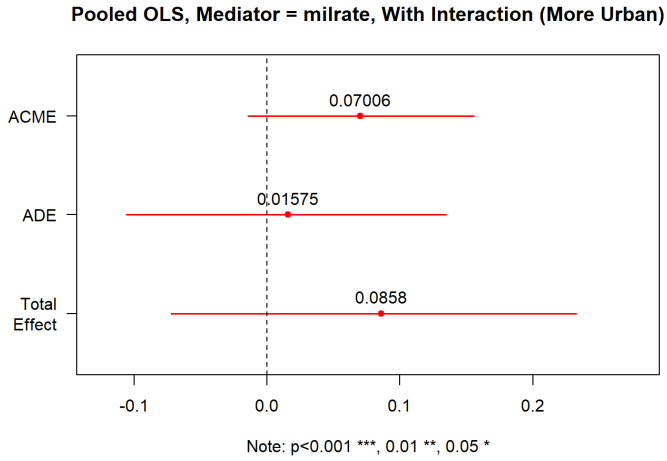

Figure B10: Conditional operation of coercive capacity in more urban states.

References

Poczter, S., & Pepinsky, T. B. (2016). Authoritarian Legacies in Post–New Order Indonesia: Evidence from a New Dataset. *Bulletin of Indonesian Economic Studies*, *52*(1), 77–100. https://doi.org/10.1080/00074918.2015.1129051