**Online Appendix**

[Computational Model Summary: 3](#_Toc97705707)

[1. Model Setup: 3](#_Toc97705708)

[1a: World Description 5](#_Toc97705709)

[1b: Setup Nations 5](#_Toc97705710)

[1c: Setup Capitols 6](#_Toc97705711)

[2. Prehistory 6](#_Toc97705712)

[2a: Front Resource Allocation 6](#_Toc97705713)

[2b: Decide Expansion 7](#_Toc97705714)

[2c: Update Resources 8](#_Toc97705715)

[2d: Structural Change 8](#_Toc97705716)

[3. Prehistory Over (Setup Governments and Districts) 8](#_Toc97705717)

[4. Taxation and Irredentism (Democracies) 9](#_Toc97705718)

[4a: Front Resource Allocation 9](#_Toc97705719)

[4b: Public Goods and Transfers in Majoritarian vs. Proportional Systems 9](#_Toc97705720)

[4c: Decide Tax Rate 12](#_Toc97705721)

[4c(i): Capitol Revenue Maximization (Prehistory Period) 13](#_Toc97705722)

[4c(ii): Citizen Utility Maximization (Main Model; Prehistory Over) 15](#_Toc97705723)

[4d: Decide Irredentism/Annexation 20](#_Toc97705724)

[4e: Update Resources 22](#_Toc97705725)

[4f: Structural Change 22](#_Toc97705726)

[4g: Update Annexed 23](#_Toc97705727)

[5. Single-Party Dictatorships; Military Dictatorships 23](#_Toc97705728)

[Appendix Figure 1: Irredentist Events Across Political Institutions 28](#_Toc97705729)

[Appendix Figure 2: Predicted Irredentist Events per Model Run by Regime Type 29](#_Toc97705730)

[6. Empirical Results 31](#_Toc97705731)

[Appendix Tables Discussion 31](#_Toc97705732)

[Appendix Table 1: Logistic Regression Results 39](#_Toc97705733)

[Appendix Table 2: Rare Events Logistic Regression Results 40](#_Toc97705734)

[Appendix Table 3: Regional Controls 41](#_Toc97705735)

[Appendix Table 4: Inclusion of Original Geddes et al. Regime Types 42](#_Toc97705736)

[Appendix Table 5a: Irredentist Democracy, Autocracy, and Anocracy 43](#_Toc97705737)

[Appendix Table 5b: Including Parliamentary/Presidential Distinction 44](#_Toc97705738)

[Appendix Table 6: Removal of Anocracy and Soviet Controls 45](#_Toc97705739)

[Appendix Table 7a: Anocratic/Anocratic by Institution 46](#_Toc97705740)

[Appendix Table 7b: Anocratic/Not Anocratic by Institution 46](#_Toc97705741)

[Appendix Table 7c: Not Anocratic/Anocratic by Institution 47](#_Toc97705742)

[Appendix Table 7d: Not Anocratic/Not Anocratic by Institution 47](#_Toc97705743)

[Appendix Table 8a: Crosscutting Cleavages; Group-Level Economic Controls 48](#_Toc97705744)

[Appendix Table 8b: Proportional Systems / Ethnic Interactions 50](#_Toc97705745)

[Appendix Table 9: Host State Controls 51](#_Toc97705746)

[Appendix Table 10: Model Performance 53](#_Toc97705747)

[7. Model Sensitivity Analyses 54](#_Toc97705748)

[Appendix Table 11: Default Model Values 55](#_Toc97705749)

[Appendix Figure 3: Graphical Results from Sensitivity Analysis 56](#_Toc97705750)

[Discussion: 59](#_Toc97705751)

[7a. Multiple Interacting Regimes 60](#_Toc97705752)

[Appendix Table 12a: Summary Statistics 62](#_Toc97705753)

[Appendix Table 12b: Majoritarian Paired Reference 62](#_Toc97705754)

[Appendix Table 12c: Proportional Paired Reference 63](#_Toc97705755)

[Appendix Table 12d: Party Paired Reference 63](#_Toc97705756)

Computational Model Summary:

The world undergoes an initial period of endogenous state formation (“Prehistory”)[[1]](#footnote-1) during which countries expand, contract, and develop boundaries through war. Within this initial phase, states seek to incorporate as much territory as they can, while also fending off advances from neighboring states. The result is a state system of borders whose configuration looks different with each model run owing to the unique and random placement of individuals and capitols on the grid. Once the state system has been established, individuals of particular nations may or may not find themselves within the borders of their corresponding nation-states, and this creates future opportunities for irredentism. States further develop political institutions to govern their territories.[[2]](#footnote-2) The government in these states sets a tax rate and particular mix of PTP goods to maximize the median utility of its W. It then evaluates whether irredentism would increase the utility of that median core supporter.

1. Model Setup:

In the prehistory, each capitol only consists of one patch of territory, and most of the world is not yet administered by any state-like authority. We use Lars-Erik Cederman’s computational model of endogenous international state formation as a starting point (Cederman 1997; 2001). Each capitol calculates whether it will attack neighboring territories (some of which remain unclaimed and accordingly defenseless) by assessing its own power and resources relative to its neighbors. Each acquired unit of territory pays a uniform tribute to the capitol, and in exchange the capitol provides welfare and defense for that territory.

This prehistory simulates a period of endogenous international state formation in which centers expand and consolidate their territory, engage in conflict against one another, and form defensible state boundaries. As this process develops, most individuals of a nation - but not all - will find themselves within the borders of a corresponding nation-state, where the majority of the population shares their nation. Other individuals of nation A will find themselves enclosed within the borders of a state where nation B is the majority. Since borders emerge endogenously, so do opportunities for irredentism, just like in the real world.

We note here it is beyond the scope of our theory to elaborate the mechanisms of why individuals in one national territory share a sense of perceived ethnic kinship with individuals across national boundaries, and it is also beyond our theoretical ambitions to model the iterative relationship between nation-state development and ethnic self-identification. Instead, we simply create interacting states where individuals within them, for whatever contingent reasons, identify as one particular national group and may find themselves outside the boundary of the same nation-state.[[3]](#footnote-3)

1a: World Description

The model starts with *T* patches of territory. In our case, we utilize the default 33x33 unit grid used in the NetLogo software which yields 1,089 individual patches.[[4]](#footnote-4)

1b: Setup Nations

On our blank grid of *T* individual territorial units, we randomly place one capitol for each of (*N*) nations. The capitol represents political leadership in our model and it takes on the administrative taxation and redistributive functions typically associated with the state. The capitol calculates the optimal mix of tax rates and PTP goods to redistribute to individuals residing within its borders to keep itself in power, as described below. Each nation is constituted by *I* individuals who are scattered around the capitol at a user-defined rate of dispersion.[[5]](#footnote-5) This setup ensures sufficient diffusion of individuals to provide opportunities for irredentism while also guaranteeing that many nation-states will possess a majority from one nation. The capitol along with its captured territories represents a state. The capitol, its territories, and the individuals residing on those territories represent a nation-state.

1c: Setup Capitols

To create states within an international system, we drew from Lars-Erik Cederman’s (1997, 2001) computational model. When the model begins, no patches of territory belong to any state beyond the capitol. The single political capital of each nation-state is endowed with a user-defined number of mobile resources that can be utilized for expansive conquest (mt), while the remaining individuals in each nation are not endowed with these resources. Per Cederman, this is to create an uneven world allowing for geopolitical competition. Each territorial unit also consists of a user-defined and uniform number of fixed resources that cannot be utilized for territorial expansion (ft).[[6]](#footnote-6)

2. Prehistory

2a: Front Resource Allocation

As our interests are not in modeling the dynamics of balancing behavior in the international system, as were Cederman’s, we use a simplified version of his resource mobilization model.[[7]](#footnote-7) At model initialization, the capital possesses only its own mobile resources to engage in foreign expansion. As the capital expands and annexes territory, each territory pays tribute (tt) to the capital, with tribute equaling each territory’s fixed territorial resources (ft) multiplied by a user-defined discount rate (gt) raised to the distance of the territory from the capital (dt):

(1)

Each capitol’s available resources (as), then, is the sum of the total tribute paid by all of its annexed territories plus its own resource units. Per Cederman, some proportion (ps) of the resources available to the capitol are fixed (fs) and cannot be allocated to fronts for the purpose of warfare, while some proportion of those resources are mobile (ms) and can be allocated to fronts for the purpose of warfare. Fronts, in this case, are defined as those territorial units that are bordered at least on one of four sides by a territory that is not part of the contiguous capitol. Of the fixed resources, the capitol must divide its fixed resources evenly among its territories. Territories on the front receive these fixed resources, and then each territory on the front also receives additional mobile resources. The capitol spreads its mobile resources evenly among all territories on the front.

2b: Decide Expansion

A capitol’s decision to expand during the prehistory is based on the resources available in its annexing border territory relative to an immediately adjacent territory outside the capitol, which constitutes a target province. At each round, each territory on the capitol’s border randomly selects a potential target. The capitol decides a probability it will attack in an attempt to annex that territory. The probability is based on the resources available in its own territory (ri) relative to the territories in the target territory (rj) that can be used to defend itself from attack. This is the balance of territorial resources (bi).

(2)

The probability of attack (pi) is then predicated on a logistic function based on user-defined parameters controlling for a threshold of balance disparity for attack (supt) and the slope of the logistic curve (supc).

(3)

The computer program randomly chooses a number between 0 and 1. If the number chosen is less than pi, the targeted territory is attacked. The probability of victory (vi) is the same as the probability of attack (pi). The program again chooses a random number between 0 and 1, and if that number is less than vi, the territory is successfully annexed into the capitol.

2c: Update Resources

With this procedure, the capitol now reassesses its total number of resources and territories available whether it annexed or lost territory (or maintained the status quo) as a result of the previous round.

2d: Structural Change

This procedure accounts for situations where the capital of a nation is annexed by another state. In these situations, a random territory from the nation in which the capital was annexed is chosen to be the new capital.

3. Prehistory Over (Setup Governments and Districts)

Once all territories in the world have been annexed, and no territories remain that have not been incorporated into one of the states, the prehistory is over. At this point, each state is divided into three districts, and each district is responsible for distributing public goods to individuals residing within that district. The capital now serves as the distribution center of public goods for one of the districts. The program calculates the mean distance of all individuals from the capital. A randomly chosen inhabited territory whose own distance from the capital is greater than the mean distance of all individuals from the capital serves as the public goods distribution center for a second district. Finally, a second randomly chosen inhabited territory whose own distance is greater than the mean distance of all individuals from both the capital and the public goods distribution center for the second district serves as the public goods distribution center for the third district. Individuals are then sorted into the district that contains the closest public goods distribution center to them.

4. Taxation and Irredentism (Democracies)

4a: Front Resource Allocation

Resource allocation to the fronts proceeds in the same way as during the prehistory phase of the model. See the discussion presented in Section 2a for further details.

4b: Public Goods and Transfers in Majoritarian vs. Proportional Systems

In majoritarian systems, each district sends one representative to a national legislature. In proportional systems, there are three representatives elected on a proportional basis who represent one national district (there are still three public goods-providing districts). Per Milesi-Ferretti et al. (2002), all three winning representatives in the national legislature represent the largest transfer group (even though only two representatives are necessary) in a majoritarian electoral system, since transfer preferences are evenly distributed across the country. As a result, the largest transfer group’s interests are represented and implemented into national policy, while the other two transfer groups’ interests are not. Since this stylized majoritarian system encourages all representatives to advocate on behalf of the same transfers, these can be put into national policy in a politically uncontroversial manner.

Preferences for public goods, on the other hand, are more local in character. Gaining the support of an elected representative who will advocate on behalf of a citizen’s desired public goods is critical. Voters therefore devote their energies to electing representatives who will actively advocate on directing particular public goods to their districts. Politicians benefit politically by promising to bias spending towards a particular district more than they do by diverting expenditures toward a single national transfer group.

Majoritarian systems thus tend to be characterized by higher public goods spending than spending on transfers. A majority (two of three) of the national representatives agree to direct public goods spending to their own districts, while a third district gets no spending (Milesi-Ferretti, Perotti, and Rostagno 2002). The winning coalition for political leaders to retain national office then consists only of citizens in the two districts receiving public goods and members of the largest transfer group. Politicians will be most attuned to the median voter within this subset of the population. The interests of citizens in the third district not receiving public goods, and members of the two smaller transfer groups, are not part of the winning coalition and thus not considered when setting national policy.[[8]](#footnote-8)

In proportional democracies, “ the median voter tries to bias the decision of the government toward his or her own transfer by electing an individual with a preference for high spending on transfers relative to public goods … the result is just high spending on the two types of transfers that get funded” (Milesi-Ferretti, Perotti, and Rostagno 2002, 619). The winning coalition necessary for politicians to maintain power in proportional democracies is thus broader than under majoritarian systems.

Subsequently, the capitol makes different decisions on what to spend on public goods and welfare transfer payments depending on whether the capitol employs majoritarian or proportional electoral systems.[[9]](#footnote-9) Each individual has preferences for how they would like to see the capitol spend on transfers or public goods as a percentage of GDP. The exogenous median citizen preference for spending on transfers as a proportion of capital spending can be represented by , while the exogenous median citizen preference for spending on public goods as a proportion of capitol spending can be represented by . These preferences are directly relational to each other. The higher the preference for public goods spending, the lower the preference for spending on transfers, and vice versa. These preferences get translated into capitol policy in different ways depending on whether an electoral system is majoritarian or proportional. Majoritarian systems incentive voters to prioritize spending on public goods over transfers, while proportional systems incentive voters to prioritize spending on transfers over public goods (see the discussion in the main text of the paper). Milesi-Ferretti et al. have formalized how these preferences are translated into the median voter preferences for public goods and transfers in both proportional and majoritarian electoral systems. Based on those median preferences, the capitol calculates the proportion of its tax revenue it will spend on expenditures on transfers (), and expenditures on public goods () in majoritarian systems, as well as the amount it will spend on transfers () and public goods () in proportional systems.[[10]](#footnote-10)

*Total Expenditure on Transfers (Majoritarian)*

(4a)

*Total Expenditure on Public Goods (Majoritarian)*

(4b)

*Total Expenditure on Transfers (Proportional)*

(4c)

*Total Expenditure on Public Goods (Proportional)*

(4d)

4c: Decide Tax Rate

When deciding the tax rate, the capitol takes two interests into consideration: First, it is interested in maximizing revenue extraction so as to provide itself with greater resources. During the prehistory, in fact, the capitol is solely preoccupied with maximizing its own resources. However, once the prehistory is over, the capitol system is established, and institutional distinctions have taken root, the capitol is now preoccupied with placating the interests of its median core supporter. We present first the capitol’s procedure for allocating resources during the prehistory (4c(i)) and during the main model period of analytical interest once the prehistory is over (4c(ii)).

4c(i): Capitol Revenue Maximization (Prehistory Period)

The capitol calculates the expected utility for itself of either raising or lowering taxes with regard to maximizing revenue, and here we draw from *The Logic of Political Survival* (Bueno de Mesquita et al. 2003) in examining the utility of rulers. The higher the tax rate, the more time citizens devote to leisure (), or time not devoted to productive and taxable activity. When making a decision to set the tax rate, the capitol first predicts the productivity of its citizens if it institutes either a unit (*is*) increase (*Ili*) or decrease (*Dli*) in the existing tax rate ().

(5a)

(5b)

(5c)

The capitol then assesses its total revenue (*vs*) given the current tax rate and levels of leisure activity, which is the average of all productive activity taxed at the current tax rate (where 1 represents maximum productivity. This is a measure of total revenue as a proportion of its maximum potential if the capitol were capable of taxing everyone completely at peak productivity). It then predicts total revenue if it raises () or lowers () the current tax rate.

(6)

(6a)

(6b)

Of that total revenue (*vs*), residents have preferences for the total amount they would like to see devoted to social spending (Ps). This is a function of the median individual in the capitol’s winning coalition’s preferences for transfers and public goods provision. This provides the total amount the capitol devotes to social spending. As we saw in the previous section, the degree to which this spending is devoted to public goods and transfers is affected by the type of electoral system a country has. The capitol predicts the total devoted to social spending if it raises () or lowers () the existing tax rate.

(7)

(7)

(7)

Taking its particular electoral system into account, the capitol then calculates separate utilities (*us*) for increasing (*Ius*) or decreasing (*Dus)* the tax rate and the resultant social spending associated with either raising (IPs) or lowering (LPs) the tax rate.[[11]](#footnote-11)

(8a)

(8b)

We utilize a logit function to reconcile the two utility functions and produce a probability S*Pr[I]* the capitol will raise the tax rate:

(8c)

The computer program then randomly chooses a number between 0 and 1. If that number is less than the probability the capitol raises the tax rate (), the tax rate is raised. If it is higher than that probability, the tax rate is lowered.

4c(ii): Citizen Utility Maximization (Main Model; Prehistory Over)

Once the prehistory is over and political institutions are in place, the capitol prioritizes placating its median core supporter over raising revenue for itself. In this section, we work our way toward an individual utility calculation for citizens based on insights from Bueno de Mesquita and colleagues (2003), Milesi-Ferretti et al. (2002), and Alesina and Spolaore (2003).

In order to develop our own utility function, we use a modified utility function described by Bueno de Mesquita et al. as a starting point:[[12]](#footnote-12)

(9a)

Where:

V(x,g,y):

V() is an additively separable, twice differentiable function that is increasing and concave in each component.

x is public goods produced (xs)

g is private goods given by the capitol (gs) if part of the winning coalition (lWS,i)

lWL,i is equal to 1 if part of winning coalition and 0 otherwise

y is a resident’s retained economic reward (1-li)(1-rs)

Where li is an individual’s leisure time and rs is the tax rate

Leisure, as noted above, is a function of the tax rate rs:

However, rather than modeling the provision of public goods simply as *xs*, we split such public investments into two parts with considerations developed from Milesi-Ferretti et al. (2002): 1) the provision of public goods and 2) welfare transfers. This is necessary as it ultimately allows us to assess the impacts of proportional vs. majoritarian electoral systems. We will integrate the following individual utility function below (9b) provided by Milesi-Ferretti et al. into equation 9a discussed above. Milesi-Ferretti et al. model an individual’s preferences for transfers () against their preference for public goods ( as a percentage of their preferences for each type of spending relative to all government revenue. Both are model parameters between 0 and 1. In their stylized model, individuals can be members of one of three transfer groups (*j*) and are in one of three public goods-providing districts in a country (*k*). In majoritarian systems, each district sends one representative to a national legislature. In proportional systems, there are three representatives elected on a proportional basis who represent one national district, although there are still three public goods providing districts. The utility of individual (*i*) in potential transfer group (*j*) in district (*k*) is modeled by Milesi-Ferretti et al. as:

(9b)

… where rs is the tax rate, sj is the value of transfers received from the capitol, and gk is the value from public goods received from the capitol. The calculations of sj and particularly gk will form a substantial proportion of our discussion going forward. If an individual does not receive public goods or transfers (under conditions described below), her utility is zero. The individual is not part of the winning coalition, and thus her preferences are not taken into consideration by the capitol.

An individual’s personal utility from transfers (sj) is the total value of transfers provided by the capitol ( above in majoritarian systems, above in proportional systems) multiplied by total revenue (vs) and then divided by the total number of individuals eligible for the particular transfers (*n*)[[13]](#footnote-13) funded by the government: Majoritarian - ; Proportional - .

The calculation of an individual’s personal utility from public goods (*gk*) involves several steps and calculations. First, the total amount of public goods sent from the capitol to each eligible district (*ck*) equals total revenue (*vs*) multiplied by the proportion of spending devoted to public goods () divided by two as the capitol only sends public goods to two districts: . In proportional systems, the amount of funds for public goods the capitol sends to each district in proportional systems equals total revenue multiplied by the production of spending devoted to public goods () divided by three as the capitol sends public goods to all three districts: .

In our model we are also interested in the impact of heterogeneity of preferences related to ethnicity (Alesina and Spolaore 2003). Accordingly, represents each individual’s idiosyncratic preference heterogeneity, and represents the distance to the nearest public good (counted as the number of patches between an individual’s location and her nearest public goods distribution center). Furthermore, for individuals whose nation is different from the majority residing in a nation-capitol, their preferences for public goods differ by a factor of *ei*. Thus, an individual’s preferences for public goods (*pi*) in terms of the distance from their own idiosyncratic preferences, their distance from the public goods provided, and their preferences potentially exacerbated by nation can be represented by:

(10a)

….. where moderates the impact of physical patch distance (*dgi*) on an individual’s utility calculation by and translates distance in number of patches to a value between 1 and 2 (making it amenable with the scale of both *hi* and *ei*)*.*

The capitol provides public goods in a manner that caters to the median preferences of its winning coalition residing within each district. In a majoritarian system, for example, the capitol targets public goods to appeal to the median preference for public goods, denoted here as *pm*. The value of public goods provided by the capitol to an individual (*gk*) is a function of the amount of spending on public goods the capitol sends to each district (ck) subtracting how far the public goods provided by the capitol deviate from each individual’s personal preference (*pi*) from those provided by the capitol that match the median district preference (*pm*).

(10b)

Finally, then, we represent each individual’s utility with the equation:[[14]](#footnote-14)

(11a)

Accordingly, the capitol assesses separate utility calculations for its median core supporter for either increasing (*Ius*) or decreasing (*Dus)* the tax rate by the interval *is*:[[15]](#footnote-15)

(11b)

(11c)

We utilize a logit function to reconcile the two utility functions and produce a probability C*Pr[I]* the capitol will raise that tax rate:

(11d)

The computer program randomly chooses a number between 0 and 1. If that number is less than the probability the capitol raises the tax rate (), the tax rate is raised. If it is higher than that probability, the tax rate is lowered. When choosing between the probability of raising taxes based on its own revenue () or placating the median core supporter (), we assume the capitol will always choose to placate its core supporters. Doing so strengthens the likelihood politicians will be able to remain in office. However, so long as raising taxes both increases the utility of the median core supporter and increases revenue, the capitol will increase taxes at the greater of the two probabilities. However, if raising taxes would increase revenue but decrease the utility of the median supporter, it will defer to the probability based on the median core supporter ().

4d: Decide Irredentism/Annexation

Just as in the prehistory, each patch of territory randomly targets one of its neighboring patches for potential annexation. The capitol considers what the median preferences for public goods would be for its winning coalition if it incorporated that patch of territory using equation 10a presented above, but this time it does so while considering a hypothetical total population including individuals residing on the potentially annexed territory in addition to the population residing within its own borders (. The capitol assesses the hypothetical preferences for public goods for individual voters in its winning coalition (HYPgk) using equation 10b, but again this time for individuals in the state’s territory and for individuals to potentially be annexed:[[16]](#footnote-16)

(12)

In addition to public goods considerations, the capitol assesses what the impact of adding new individuals to its transfer welfare scheme for the individual utility of its median supporter. If N individuals residing on the patch to be potentially annexed are transfer eligible, each individual in the winning coalition will have to share transfers distributed by the capitol with an additional N individuals (HYPsj).

When assessing the probability of engaging an irredentism, then, the capitol considers the interests of its core constituents. The capitol assesses any potential added value or liabilities to annexing foreign territory to the utility of its median core supporter. It considers a hypothetical run of the procedure described in Section 4b above in that it postulates what it would have to spend on public goods HYPgk and transfers HYPsj for its entire population, including the target, given preferences for public goods and transfers of its citizens as well as the target population. It is important to note here that the state also considers the relative wealth of the target (via its likely productivity). It calculates the implications of those changes in spending and revenue for the utility of the median core constituent (Aus):

(12c)

It assesses this against the status quo, which is the median core constituent’s current utility without annexing any addition constituents.

(12d)

The decision, then, on whether the capitol will want to pursue irredentism is predicated simply on whether the median core constituent’s utility is greater under potential irredentist annexation or under (Aus) or the status quo ().

The computer program then engages in the same decision-making procedure elaborated in section 2b above where it assesses the probability of winning and then potentially initiates a conflict with no guarantee of victory. If it subsequently decides not to attack or loses the conflict, the status quo remains.

4e: Update Resources

As in the prehistory, the capitol now reassesses its total number of resources and territories available as a result of whether it annexed or lost territory as a result of the previous round. It also now assigns potential new members of the population into public goods districts.

4f: Structural Change

As in the prehistory, this procedure accounts for situations where the capital of a nation is annexed by another capitol. In these situations, a random territory from the nation in which the capital was annexed is chosen to be the new capital. The procedure also accounts for whether public goods centers in each district have been annexed. In this case, the public goods center is repositioned in a random location within the remaining district.

4g: Update Annexed

## This procedure assesses whether individuals reside within new capitols as a result of annexation and updates attributes accordingly. The considerations laid out in this section are only relevant when the irredentist state targets a populated patch. When the irredentist state targets an unpopulated patch, the only considerations for the potential irredentist state are those specified for the prehistory. Annexation of an unpopulated patch is not counted as an act of irredentism.

5. Single-Party Dictatorships; Military Dictatorships

Dictatorships utilize most of the same decision-making criteria as electoral regimes, and so our discussion here will be shorter. However, to keep the support of individuals in a winning coalition, rather than offering a combination of public goods and transfers according to the preferences of voters, as in the electoral version of the model, the capitol in dictatorships offers private goods to individuals in exchange for supporting the regime. The key for the capitol is to develop the correct mix of private goods (relative to spending on public goods and transfers) that satisfies the median member of its typically very small winning coalition.

We model the size of the winning coalition in authoritarian regimes as exogenous to the model where the winning coalition constitutes some user-defined proportion of the selectorate (*wss*), resulting in a specific number of people (*Nws*). The model also begins with an exogenously determined proportion of private goods (ps) to both public goods and transfers (nps=1-ps). This ratio becomes endogenous to the model as it continues, but the user provides a beginning point of reference.[[17]](#footnote-17) The model then endogenously changes the initial user-provided ratio of private goods in accordance with maximizing the utility of the median member of the winning coalition. This is a function of the private goods that individual would receive in relation to public goods and transfers that individual would receive if the state either increased (or decreased (private goods provision by an interval *vis* at the current tax rate (equation 13a below). We assume some token electoral system is in place, and the generally minimal remainder of revenue in place after satisfying the winning coalition with private goods is allocated to public goods and transfers according to the same logic as presented in the section above. The calculations of the median supporter’s utility for increasing and decreasing the provision of private goods is modeled below in equations 13a and 13b:

(13a)

(13b)

…with RPRIVgs (raising the proportion of state spending given to private goods) equal to the capitol’s tax revenue (*vs* - see equations 5a, 5b, 5c, and 6 in the appendix) multiplied by the proportion of the capitol’s revenue devoted to private goods (ps) plus the potential incremental increase in private goods (vis). This product is then divided by the number of individuals in the winning coalition (Nwss): . Likewise, LPRIV examines the private payoff to each individual when decreasing the proportion of capitol spending to private payoffs by vis: .

After having settled on whether to raise or lower the proportion of the capitol’s spending devoted to providing private goods in order to optimize the utility of the median member of the winning coalition, the capitol decides upon a tax rate utilizing the same procedure described in equations 11a through 11d above.

*Irredentism*

When dictatorships consider irredentism, the capitols employ the same decision-making structures described above for democracies, culminating in the same utility function and decision-making procedures specified for majoritarian and proportional regimes..[[18]](#footnote-18)  However, we make an important change[[19]](#footnote-19) by considering the hypothetical private goods an individual would receive (HYPgs) if irredentism were to occur, represented by equation 14c below.[[20]](#footnote-20)

(14c)

(14d)

The decision, then, on whether the capitol will want to pursue irredentism is predicated simply on whether the median core constituent’s utility is greater under potential irredentist annexation or under (Aus) or the status quo ().

The computer program then engages in the same decision-making procedure elaborated in section 2b above where it assesses the probability of winning and then potentially initiates a conflict with no guarantee of victory. If it subsequently decides not to attack or loses the conflict, the status quo remains. [[21]](#footnote-21)

To calculate (the payoff of private goods that median member could potentially receive given annexation, i.e., irredentism) in 14c above, individuals first calculate their likelihood of remaining in the state’s winning coalition if the winning coalition were to shift given the incorporation of new ethnic kin who could potentially be competitors for access to the winning coalition. The probability of being excluded from any new potential winning coalition (Pr[E]) is modeled as: . [[22]](#footnote-22)

The program chooses a random number between 0 and 1. If that number is less than Pr[E], is set to 0. If that number is greater than Pr[E], is set to where is the hypothetical number of individuals in the winning coalition if annexed individuals are part of the winning coalition with probability W. In this way, individuals calculate whether irredentism would threaten their continued access to private goods by maintaining their status as members of the winning coalition.

**Model Analysis**

We use this computational model to make theoretical predictions for irredentism under four institutional regimes: military dictatorships, single-party dictatorships, proportional electoral systems, and majoritarian electoral systems. [[23]](#footnote-23) The unit of analysis is a model “run,” which involves ten states of the same institutional type (each populated by approximately 50 individuals) interacting together over 200 iterations (“rounds”), which provides sufficient time to examine patterns in irredentist behavior. [[24]](#footnote-24) For each institutional type, we isolate its impact on irredentism.[[25]](#footnote-25)

Appendix Table 11 placed further down in this appendix (as a default model for comparison to our sensitivity analyses) lists the default values used for key variables that remain constant across runs of the model. Appendix Figure 1 below provides a simple descriptive plot displaying the distribution of irredentist events across all model runs[[26]](#footnote-26) and the four different political regimes. Each plus sign signifies one model run. Plus signs are stacked when multiple model runs experience the same number of irredentist events. While Appendix Figure 1 provides us with a visual sense of the distribution of irredentist events, we also estimated a negative binomial regression model with the total count of irredentist events per model run as our dependent variable and regime type as our independent variable. For each of the four institutional types, we calculate and compare predicted counts of irredentism to assess the theory’s predictions. Appendix Figure 2 presents the mean observed count of irredentist events per model run by institutional type with confidence intervals.

Appendix Figure 1: Irredentist Events Across Political Institutions



Appendix Figure 2: Predicted Irredentist Events per Model Run by Regime Type



As can be seen visually from Appendix Figure 1, irredentism is a relatively rare event. Sixty percent of the time, irredentism does not occur at all, and zero irredentist events is the modal outcome across all political institutional categories. 57% of the majoritarian runs did not experience an irredentist event, while 64.5% of the proportional runs did not experience an irredentist event. Likewise, 66.5% of the single party runs and 52% of the military runs did not experience an irredentist event. At the same time, there is variation across political institutions’ propensities for irredentism. Proportional electoral systems and single party dictatorships tended to see tighter distributions closer to a smaller number of irredentist events, with standard deviations of 2.42 and 1.8, respectively. Majoritarian electoral systems and military dictatorships saw greater spread away from zero with respective standard deviations of 3.10 and 3.61.

According to our negative binomial model visually depicted in Appendix Figure 2 above, proportional democracies and single party dictatorships, while not statistically differentiated from each other, share significantly fewer incidences of irredentism than military dictatorships and proportional democracies. Proportional democracies have a mean of 1.04 predicted irredentist events per model run, while single party dictatorships have a mean of 0.92. Likewise, military dictatorships and majoritarian democracies are not statistically differentiated from each other, but all are significantly more predisposed to irredentism, at the 95% confidence interval, than either single-party dictatorships or proportional democracies. Military dictatorships have a mean of 2.215 irredentist events predicted by the model while majoritarian electoral systems have a mean of 1.77. In sum, the model predicts two distinct clusters: proportional systems and single-party dictatorships with a low incidence of irredentism; majoritarian systems and military dictatorships with a much higher incidence of irredentism.

6. Empirical Results

Appendix Tables Discussion

Appendix Table 1 presents our empirical raw logit results when running separate models by excluding each of our four institutional types as a reference variable. While it is of course not necessary to include a column for each excluded regime category to interpret the results, we do so as a courtesy to the reader to facilitate comparison across institutions.

The coefficients of these models can be difficult to interpret directly, and so see our discussion of Figure 3 in the main article for a more interpretable discussion of our model results using predicted probabilities. The coefficients on the three included types of political institutions are interpreted in relation to the omitted institutional category. Model 1 excludes the majoritarian category, Model 2 excludes the proportional category, Model 3 the party category, and Model 4 the military/personalist category. When excluding the Majoritarian categorical variable (Model 1), we see that the Proportional variable has a negative sign and is statistically significant, with a coefficient of -1.73. This means the log odds of irredentism are statistically lower in proportional regimes than they are in majoritarian regimes. We see a similar relationship when looking at single-party regimes. Here the coefficient is -1.34 and statistically significant, also indicating that single-party dictatorships demonstrate lower log odds of irredentism than majoritarian electoral systems. Furthermore, military/personalist dictatorships are not statistically differentiated from majoritarian electoral systems. All of these results are consistent with the predictions from the computational model.

If we examine Model 2, the coefficients on our institutional variables are interpreted against proportional systems as a reference. Thus, we see that majoritarian systems and military/personalist systems demonstrated statistically significant and higher log odds of irredentism than proportional systems, while single-party dictatorships are not statistically differentiated. In Model 3, the coefficients are interpreted against single-party dictatorships. Majoritarian systems and military/personalistic dictatorships are statistically significant and have higher log odds of irredentism than single-party dictatorships, while proportional electoral systems have no statistically differentiated effect. Finally, in Model 4 the coefficients are interpreted against military/personalistic dictatorships as the omitted category. We see that both proportional electoral systems and single-party dictatorships have statistically significantly negative log odds of irredentism as compared to military/personalistic dictatorships. All of these results are consistent with the predictions of the computational model.

As for other results of potential theoretical interest, our dyadic configurations highlight whether both the irredentist and host capitols are anocratic or not. Accordingly, the variable anoc/anoc reports when both the irredentist and host capitols are anocratic. Anoc/no refers to situations where the host capitol is anocratic and the potential irredentist capitol is not, no/anoc is when the host capitol is not anocratic but the potential irredentist capitol is, and finally the omitted reference no/no category refers to situations whether neither capitol is anocratic. We see that when both the irredentist capitol and host capitol are anocracies, the log odds of irredentism go up markedly relative to configurations where neither is anocratic. Similarly, when either one of the capitols is anocratic, the log odds of irredentism go up, but we have greater statistical confidence this is the case when the irredentist capitol is the one that is anocratic.

Appendix Table 2 presents logit results when we run our model as a rare events logistic regression rather than a standard logistic regression. As can be seen, there is little difference from the substantive results presented in Appendix Table 1.

Appendix Table 3 adds a variety of regional controls to the model. These regional categories included Western Europe and the Americas, Eastern Europe, Central Europe/The Middle East/ North Africa, Southeast Asia, and Sub-Saharan Africa. Western Europe and the Americas is the excluded reference category. As can be seen, the inclusion of regional controls has little substantive impact on our primary institutional variables of interest.

Appendix Table 4 utilizes all of Geddes et al.’s authoritarian regime categorizations rather than the condensed version we use in our primary model results. We have disaggregated the military and personalistic regime types, and we have also added the monarchy category. There are a few points to note here. First, the main model patterns remain the same. Second, the personal and military categories follow the same general pattern with each other in terms of their relationships with the other variables, providing support for our theoretical decision to aggregate them into a single measure (based on the theoretical assumption that both had small selectorates and small winning coalitions). Finally, monarchy does not have a statistically significant relationship with any of the other regime types except for being less likely to engage in irredentism than proportional democracies at the 90% confidence interval. This is likely because they constitute just under 2% of the observations.

Appendix Table 5a utilizes regime characteristics of the irredentist state, rather than the dyadic considerations with the host state utilized in the main model. Here we employ three categorical variables for regime type tracking the general influence of democracy, autocracy, and anocracy with anocracy constituting the omitted reference variable. Inclusion of these regime characteristics as controls has no substantive impact on our model results.

Appendix Table 5b assesses the robustness of our results when we add a distinction between presidential and parliamentarian systems with a categorical variable assessing whether a country is presidential, parliamentarian, or authoritarian. This data comes from Bormann and Golder (2013), and parliamentarian systems serve as the omitted reference category. We include these controls because selectorate theory makes a distinction among democracies by suggesting presidential systems possess larger winning coalitions than parliamentary systems (Bueno de Mesquita et al. 2003, 54-55). This could, in turn, have associated implications for irredentism. Bueno de Mesquita and colleagues argue parliamentary systems may have smaller winning coalitions than presidential systems and subsequently may be more predisposed to providing private goods. Although parliamentary systems certainly would have significantly larger winning coalitions than single party dictatorships, they would similarly be characterized by smaller winning coalitions (relative to presidential systems) with large selectorates, and individuals in the winning coalition would subsequently covetously safeguard their private goods and oppose irredentism. While we find that parliamentary systems do have a lessened association with irredentism relative to presidential systems at the 90% confidence interval, inclusion of these controls has no substantive impact on our primary model results.

To further assess the robustness of our statistical results, we remove the anocracy dyads and Soviet controls for Appendix Table 6. As can be seen, there is little substantive difference on our key regime variables from those presented in the paper’s primary model. Additionally, Appendix Table 7(a-d) provides descriptive cross tabs for the anocracy dyads and our four institutional variables.

Furthermore, Appendix Table 8a assesses the potential impact of crosscutting linguistic and religious cleavages (Crosscut) (Selway 2011) along with several group-level economic controls including the ratio of wealth of the ethnic group in the irredentist state relative to the group in the host state and the economic status of the group in the irredentist state relative to other ethnic groups in the irredentist state (IrrHigh/IrrLow). Inclusion of these controls do not alter the primary results of our main model.

In Appendix Table 8b, we further test for the possibility that ethnic or religious factors might be a cause for party alignment in proportional democracies rather than ideology. In such a situation, ethnic identities might inhibit PTP goods provision, even in a proportional setting, and encourage irredentism to further strengthen the economic status of members of the ethnic group in power. As ethnic fractionalization increases, then, irredentism becomes more likely. We provide a control for ethnic fractionalization (Ethnic Fractionalization) in Model 1 along with an interaction effect between proportional systems and ethnic fractionalization (ProportionXEthnic), a control for religious fractionalization (Religious Fractionalization) in Model 2 along with an interaction effect between proportional systems and religious fractionalization (ProportionXReligious), and a control for crosscutting ethnic and religious identities (Crosscutting) in Model 3 along with an interaction effect between proportional systems and religious fractionalization (ProportionXCrosscutting) (Selway 2011).

We find an interaction effect, but negative and in the opposite direction as expected from the discussion in the preceding paragraph. Model 1 suggests that as ethnic heterogeneity increases in proportional systems, propensities for irredentism decrease relative to majoritarian electoral systems. Model 2 suggests a similar relationship for religious fractionalization and its interaction with proportional systems. Model 3, on the other hand, does not indicate a statistically significant interaction effect between crosscutting ethnic and religious identities and proportional systems. While the inclusion of these interaction terms does not have a substantive impact on our primary results, their negative and significant coefficients do highlight another distinction between proportional and majoritarian systems. The predicted probability of irredentism in proportional systems goes down as countries become more ethnically or religiously fractionalized and remain well below, and statistically differentiated from, the predicted probability of irredentism in majoritarian systems at all but the bottom ten percent of the values of ethnic and religious fractionalization.

Appendix Table 9 provides additional controls regarding the ethnic composition of the host state and the potential for the irredentist state to be incorporating ethnically heterogeneous populations. These include, in models 1 through 4, a control for the ethnic fractionalization of the host state and, in models 5 through 8, a control for the number of groups in the host state. The inclusion of these control variables does not impact the main model results.

Finally, Appendix Table 10 runs model fit and classification tests between the primary model presented in this paper and the model presented by Siroky and Hale (2017) that previously demonstrated a positive interaction effect between majoritarian democracies and the size of the largest ethnic group relative to the second largest ethnic group. That model further included the group-level economic controls we have already controlled for in Appendix Table 8. The point of this analysis is to assess the performance of the theoretical model presented in this paper against potentially alternative arguments presented in the earlier paper by Siroky and Hale.

To assess the performance of the current model against the previous paper, and to facilitate an apples-to-apples comparison for our model fit statistics, we reproduce the primary model presented in Siroky and Hale (2017) but dropped those observations for which the regime categorical variables in the current paper had missing data values[[27]](#footnote-27) and present the results of that analysis in Model 1. They are substantively the same as those presented in the previous paper.[[28]](#footnote-28) In Model 2, we replace the majoritarian and majoritarian/margin interaction variables from Model 1 and replace them with the Majoritarian, Proportional, Party, and Military institutional variables that constitute the predominant theoretical preoccupation of our current paper.[[29]](#footnote-29) Finally, in Model 3, we add a majoritarian/ethnic margin interaction term to the model presented in Model 2 in order to assess the value added for including such a term in the model including our new regime variables. We then run a variety of model fit and classification assessments including log-likelihood, Akaike information criterion (AIC), Bayesian information criterion (BIC), area under the curve (AUC), F1 Score (F1 Score), and Matthews Correlation Coefficient (MCC), all presented in Appendix Table 10 below.[[30]](#footnote-30)

The results unambiguously demonstrate the models including the new regime distinctions of the current paper (Models 2 and 3) outperform the model based on the previous 2017 paper (Model 1). Each of the model fit and specification statistics including BIC, AIC, log likelihood, the F1 score, and MCC strongly support a better model fit or specification for Model 2 over Model 1 (AUC is tied). Among most of the measures of model fit or specification, inclusion of the interaction term (in Model 3) causes that model to marginally perform better than Model 2 (without the interaction term). However, we note the BIC score, which penalizes further complications to the model, provides support that Model 2 better and more parsimoniously fits the data. For this reason, and more critically because inclusion of the interaction term greatly complicates interpretation of the key theoretical relationships we wish to examine amongst the four institutional regime types (which are mutually exclusive categorical variables interpreted against an omitted category), we do not utilize the interaction term in the main model presented in the paper.

Appendix Table 1: Logistic Regression Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| VARIABLES | Majoritarian | Proportional | Party | Military |
| 1.Majoritarian |  | 1.73\*\*\* | 1.34\*\* | -0.07 |
|  |  | (0.50) | (0.58) | (0.55) |
| 2.Proportional | -1.73\*\*\* |  | -0.39 | -1.80\*\*\* |
|  | (0.50) |  | (0.57) | (0.43) |
| 3.Party | -1.34\*\* | 0.39 |  | -1.41\*\*\* |
|  | (0.58) | (0.57) |  | (0.51) |
| 4.Military | 0.07 | 1.80\*\*\* | 1.41\*\*\* |  |
|  | (0.55) | (0.43) | (0.51) |  |
| Anocracy/Anocracy | 2.02\*\*\* | 2.02\*\*\* | 2.02\*\*\* | 2.02\*\*\* |
|  | (0.47) | (0.47) | (0.47) | (0.47) |
| Anocracy/No | 0.88\* | 0.88\* | 0.88\* | 0.88\* |
|  | (0.45) | (0.45) | (0.45) | (0.45) |
| No/Anocracy | 0.73\*\*\* | 0.73\*\*\* | 0.73\*\*\* | 0.73\*\*\* |
|  | (0.24) | (0.24) | (0.24) | (0.24) |
| Margin | 0.30 | 0.30 | 0.30 | 0.30 |
|  | (0.50) | (0.50) | (0.50) | (0.50) |
| Dispersed | -1.55 | -1.55 | -1.55 | -1.55 |
|  | (1.14) | (1.14) | (1.14) | (1.14) |
| Discriminated | -0.18 | -0.18 | -0.18 | -0.18 |
|  | (0.53) | (0.53) | (0.53) | (0.53) |
| Wealth Ratio | -0.28 | -0.28 | -0.28 | -0.28 |
|  | (0.31) | (0.31) | (0.31) | (0.31) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.07 | 0.07 | 0.07 | 0.07 |
|  | (0.10) | (0.10) | (0.10) | (0.10) |
| Irredentist Soviet | -0.77 | -0.77 | -0.77 | -0.77 |
|  | (0.70) | (0.70) | (0.70) | (0.70) |
| Host Soviet | 0.32 | 0.32 | 0.32 | 0.32 |
|  | (0.49) | (0.49) | (0.49) | (0.49) |
| Peace years | -1.47\*\*\* | -1.47\*\*\* | -1.47\*\*\* | -1.47\*\*\* |
|  | (0.23) | (0.23) | (0.23) | (0.23) |
| Peace years2 | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | 0.22 | -1.50\*\*\* | -1.11 | 0.29 |
|  | (0.64) | (0.53) | (0.68) | (0.50) |
| Observations | 3,527 | 3,527 | 3,527 | 3,527 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 2: Rare Events Logistic Regression Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (5) | (6) | (7) | (8) |
| VARIABLES | MajRare | PropRare | PartRare | MilRare |
| 1.Majoritarian |  | 1.62\*\*\* | 1.28\*\* | -0.07 |
|  |  | (0.50) | (0.57) | (0.55) |
| 2.Proportional | -1.62\*\*\* |  | -0.34 | -1.69\*\*\* |
|  | (0.50) |  | (0.56) | (0.43) |
| 3.Party | -1.28\*\* | 0.34 |  | -1.36\*\*\* |
|  | (0.57) | (0.56) |  | (0.51) |
| 4.Military | 0.07 | 1.69\*\*\* | 1.36\*\*\* |  |
|  | (0.55) | (0.43) | (0.51) |  |
| Anocracy/Anocracy | 1.91\*\*\* | 1.91\*\*\* | 1.91\*\*\* | 1.91\*\*\* |
|  | (0.47) | (0.47) | (0.47) | (0.47) |
| Anocracy/No | 0.87\* | 0.87\* | 0.87\* | 0.87\* |
|  | (0.45) | (0.45) | (0.45) | (0.45) |
| No/Anocracy | 0.70\*\*\* | 0.70\*\*\* | 0.70\*\*\* | 0.70\*\*\* |
|  | (0.24) | (0.24) | (0.24) | (0.24) |
| Margin | 0.27 | 0.27 | 0.27 | 0.27 |
|  | (0.50) | (0.50) | (0.50) | (0.50) |
| Dispersed | -1.06 | -1.06 | -1.06 | -1.06 |
|  | (1.14) | (1.14) | (1.14) | (1.14) |
| Discriminated | -0.16 | -0.16 | -0.16 | -0.16 |
|  | (0.52) | (0.52) | (0.52) | (0.52) |
| Wealth Ratio | -0.27 | -0.27 | -0.27 | -0.27 |
|  | (0.31) | (0.31) | (0.31) | (0.31) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.08 | 0.08 | 0.08 | 0.08 |
|  | (0.10) | (0.10) | (0.10) | (0.10) |
| Irredentist Soviet | -0.69 | -0.69 | -0.69 | -0.69 |
|  | (0.69) | (0.69) | (0.69) | (0.69) |
| Host Soviet | 0.29 | 0.29 | 0.29 | 0.29 |
|  | (0.49) | (0.49) | (0.49) | (0.49) |
| Peace years | -1.39\*\*\* | -1.39\*\*\* | -1.39\*\*\* | -1.39\*\*\* |
|  | (0.23) | (0.23) | (0.23) | (0.23) |
| Peace years2 | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | 0.19 | -1.43\*\*\* | -1.09 | 0.26 |
|  | (0.64) | (0.53) | (0.67) | (0.50) |
| Observations | 3,527 | 3,527 | 3,527 | 3,527 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 3: Regional Controls

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| VARIABLES | Majoritarian | Proportional | Party | Military |
| 1.Majoritarian |  | 1.29\*\*\* | 1.39\*\* | 0.39 |
|  |  | (0.48) | (0.55) | (0.53) |
| 2.Proportional | -1.29\*\*\* |  | 0.10 | -0.91\* |
|  | (0.48) |  | (0.52) | (0.47) |
| 3.Party | -1.39\*\* | -0.10 |  | -1.01\*\* |
|  | (0.55) | (0.52) |  | (0.50) |
| 4.Military | -0.39 | 0.91\* | 1.01\*\* |  |
|  | (0.53) | (0.47) | (0.50) |  |
| Anocracy/Anocracy | 1.97\*\*\* | 1.97\*\*\* | 1.97\*\*\* | 1.97\*\*\* |
|  | (0.44) | (0.44) | (0.44) | (0.44) |
| Anocracy/No | 1.07\*\* | 1.07\*\* | 1.07\*\* | 1.07\*\* |
|  | (0.50) | (0.50) | (0.50) | (0.50) |
| No/Anocracy | 0.56\* | 0.56\* | 0.56\* | 0.56\* |
|  | (0.31) | (0.31) | (0.31) | (0.31) |
| Margin | 1.23 | 1.23 | 1.23 | 1.23 |
|  | (0.75) | (0.75) | (0.75) | (0.75) |
| Dispersed | -1.62 | -1.62 | -1.62 | -1.62 |
|  | (1.06) | (1.06) | (1.06) | (1.06) |
| Discriminated | -0.18 | -0.18 | -0.18 | -0.18 |
|  | (0.58) | (0.58) | (0.58) | (0.58) |
| Wealth Ratio | -0.14 | -0.14 | -0.14 | -0.14 |
|  | (0.32) | (0.32) | (0.32) | (0.32) |
| Host Population | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.17 | 0.17 | 0.17 | 0.17 |
|  | (0.14) | (0.14) | (0.14) | (0.14) |
| Irredentist Soviet | -0.60 | -0.60 | -0.60 | -0.60 |
|  | (0.63) | (0.63) | (0.63) | (0.63) |
| Host Soviet | 0.27 | 0.27 | 0.27 | 0.27 |
|  | (0.59) | (0.59) | (0.59) | (0.59) |
| Eastern Europe | 1.74\* | 1.74\* | 1.74\* | 1.74\* |
|  | (0.95) | (0.95) | (0.95) | (0.95) |
| C. Europe/ME/N. Africa | 2.89\*\*\* | 2.89\*\*\* | 2.89\*\*\* | 2.89\*\*\* |
|  | (1.03) | (1.03) | (1.03) | (1.03) |
| Southeast Asia | - | - | - | - |
|  |  |  |  |  |
| Sub-Saharan Africa | 2.39\*\* | 2.39\*\* | 2.39\*\* | 2.39\*\* |
|  | (1.11) | (1.11) | (1.11) | (1.11) |
| Peace years | -1.42\*\*\* | -1.42\*\*\* | -1.42\*\*\* | -1.42\*\*\* |
|  | (0.25) | (0.25) | (0.25) | (0.25) |
| Peace years2 | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | -2.63\*\* | -3.93\*\*\* | -4.03\*\*\* | -3.02\*\*\* |
|  | (1.03) | (1.12) | (1.18) | (1.14) |
| Observations | 3,248 | 3,248 | 3,248 | 3,248 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 4: Inclusion of Original Geddes et al. Regime Types

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| VARIABLES | Majoritarian | Proportional | Party | Military | Monarchy | Personal |
|  |  |  |  |  |  |  |
| 1.Majoritarian |  | 1.71\*\*\* | 1.34\*\* | -0.42 | 0.43 | 0.00 |
|  |  | (0.50) | (0.57) | (0.34) | (0.80) | (0.58) |
| 2.Proportional | -1.71\*\*\* |  | -0.37 | -2.13\*\*\* | -1.28\* | -1.71\*\*\* |
|  | (0.50) |  | (0.56) | (0.40) | (0.72) | (0.44) |
| 3.Party | -1.34\*\* | 0.37 |  | -1.76\*\*\* | -0.91 | -1.34\*\* |
|  | (0.57) | (0.56) |  | (0.57) | (0.81) | (0.52) |
| 4.Military | 0.42 | 2.13\*\*\* | 1.76\*\*\* |  | 0.85 | 0.42 |
|  | (0.34) | (0.40) | (0.57) |  | (0.68) | (0.46) |
| 5.Monarchy | -0.43 | 1.28\* | 0.91 | -0.85 |  | -0.43 |
|  | (0.80) | (0.72) | (0.81) | (0.68) |  | (0.74) |
| 6.Personal | -0.00 | 1.71\*\*\* | 1.34\*\* | -0.42 | 0.43 |  |
|  | (0.58) | (0.44) | (0.52) | (0.46) | (0.74) |  |
| Anocracy/Anocracy | 1.97\*\*\* | 1.97\*\*\* | 1.97\*\*\* | 1.97\*\*\* | 1.97\*\*\* | 1.97\*\*\* |
|  | (0.45) | (0.45) | (0.45) | (0.45) | (0.45) | (0.45) |
| Anocracy/No | 0.83\*\* | 0.83\*\* | 0.83\*\* | 0.83\*\* | 0.83\*\* | 0.83\*\* |
|  | (0.42) | (0.42) | (0.42) | (0.42) | (0.42) | (0.42) |
| No/Anocracy | 0.68\*\*\* | 0.68\*\*\* | 0.68\*\*\* | 0.68\*\*\* | 0.68\*\*\* | 0.68\*\*\* |
|  | (0.22) | (0.22) | (0.22) | (0.22) | (0.22) | (0.22) |
| Margin | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
|  | (0.47) | (0.47) | (0.47) | (0.47) | (0.47) | (0.47) |
| Dispersed | -1.62 | -1.62 | -1.62 | -1.62 | -1.62 | -1.62 |
|  | (1.14) | (1.14) | (1.14) | (1.14) | (1.14) | (1.14) |
| Discriminated | -0.15 | -0.15 | -0.15 | -0.15 | -0.15 | -0.15 |
|  | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) |
| Wealth Ratio | -0.26 | -0.26 | -0.26 | -0.26 | -0.26 | -0.26 |
|  | (0.29) | (0.29) | (0.29) | (0.29) | (0.29) | (0.29) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
|  | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) |
| Irredentist Soviet | -0.75 | -0.75 | -0.75 | -0.75 | -0.75 | -0.75 |
|  | (0.70) | (0.70) | (0.70) | (0.70) | (0.70) | (0.70) |
| Host Soviet | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
|  | (0.48) | (0.48) | (0.48) | (0.48) | (0.48) | (0.48) |
| Peace years | -1.40\*\*\* | -1.40\*\*\* | -1.40\*\*\* | -1.40\*\*\* | -1.40\*\*\* | -1.40\*\*\* |
|  | (0.21) | (0.21) | (0.21) | (0.21) | (0.21) | (0.21) |
| Peace years2 | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | 0.26 | -1.45\*\*\* | -1.08\* | 0.67 | -0.18 | 0.26 |
|  | (0.63) | (0.52) | (0.66) | (0.44) | (0.66) | (0.53) |
| Observations | 3,590 | 3,590 | 3,590 | 3,590 | 3,590 | 3,590 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 5a: Irredentist Democracy, Autocracy, and Anocracy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| VARIABLES | Majoritarian | Proportional | Party | Military |
|  |  |  |  |  |
| 1.Majoritarian |  | 1.31\*\*\* | 1.52\*\* | 0.26 |
|  |  | (0.49) | (0.71) | (0.62) |
| 2.Proportional | -1.31\*\*\* |  | 0.21 | -1.05\* |
|  | (0.49) |  | (0.81) | (0.63) |
| 3.Party | -1.52\*\* | -0.21 |  | -1.26\*\*\* |
|  | (0.71) | (0.81) |  | (0.47) |
| 4.Military | -0.26 | 1.05\* | 1.26\*\*\* |  |
|  | (0.62) | (0.63) | (0.47) |  |
| Democracy | -1.55\*\*\* | -1.55\*\*\* | -1.55\*\*\* | -1.55\*\*\* |
|  | (0.54) | (0.54) | (0.54) | (0.54) |
| Autocracy | -0.25 | -0.25 | -0.25 | -0.25 |
|  | (0.40) | (0.40) | (0.40) | (0.40) |
| Margin | 0.15 | 0.15 | 0.15 | 0.15 |
|  | (0.61) | (0.61) | (0.61) | (0.61) |
| Dispersed | -1.78 | -1.78 | -1.78 | -1.78 |
|  | (1.15) | (1.15) | (1.15) | (1.15) |
| Discriminated | -0.02 | -0.02 | -0.02 | -0.02 |
|  | (0.49) | (0.49) | (0.49) | (0.49) |
| Wealth Ratio | -0.39 | -0.39 | -0.39 | -0.39 |
|  | (0.37) | (0.37) | (0.37) | (0.37) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.03 | 0.03 | 0.03 | 0.03 |
|  | (0.11) | (0.11) | (0.11) | (0.11) |
| Irredentist Soviet | -0.74 | -0.74 | -0.74 | -0.74 |
|  | (0.73) | (0.73) | (0.73) | (0.73) |
| Host Soviet | 0.77\* | 0.77\* | 0.77\* | 0.77\* |
|  | (0.47) | (0.47) | (0.47) | (0.47) |
| Peace years | -1.36\*\*\* | -1.36\*\*\* | -1.36\*\*\* | -1.36\*\*\* |
|  | (0.21) | (0.21) | (0.21) | (0.21) |
| Peace years2 | 0.08\*\*\* | 0.08\*\*\* | 0.08\*\*\* | 0.08\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | 1.30\*\* | -0.01 | -0.22 | 1.04 |
|  | (0.57) | (0.59) | (0.80) | (0.67) |
| Observations | 3,651 | 3,651 | 3,651 | 3,651 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 5b: Including Parliamentary/Presidential Distinction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| VARIABLES | Majoritarian | Proportional | Party | Military |
|  |  |  |  |  |
| 1.Majoritarian |  | 1.75\*\*\* | 1.32\*\* | -0.14 |
|  |  | (0.55) | (0.55) | (0.42) |
| 2.Proportional | -1.75\*\*\* |  | -0.43 | -1.89\*\*\* |
|  | (0.55) |  | (0.71) | (0.51) |
| 3.Party | -1.32\*\* | 0.43 |  | -1.46\*\*\* |
|  | (0.55) | (0.71) |  | (0.52) |
| 4.Military | 0.14 | 1.89\*\*\* | 1.46\*\*\* |  |
|  | (0.42) | (0.51) | (0.52) |  |
| 2.Presidential | 1.15\* | 1.15\* | 1.15\* | 1.15\* |
|  | (0.66) | (0.66) | (0.66) | (0.66) |
| 3.Authoritarian | 0.50 | 0.50 | 0.50 | 0.50 |
|  | (0.38) | (0.38) | (0.38) | (0.38) |
| Anocratic/Anocratic | 2.01\*\*\* | 2.01\*\*\* | 2.01\*\*\* | 2.01\*\*\* |
|  | (0.49) | (0.49) | (0.49) | (0.49) |
| Anocratic/No | 0.94\*\* | 0.94\*\* | 0.94\*\* | 0.94\*\* |
|  | (0.48) | (0.48) | (0.48) | (0.48) |
| No/Anocratic | 0.72\*\*\* | 0.72\*\*\* | 0.72\*\*\* | 0.72\*\*\* |
|  | (0.27) | (0.27) | (0.27) | (0.27) |
| Margin | 0.48 | 0.48 | 0.48 | 0.48 |
|  | (0.52) | (0.52) | (0.52) | (0.52) |
| Dispersed | -1.81 | -1.81 | -1.81 | -1.81 |
|  | (1.39) | (1.39) | (1.39) | (1.39) |
| Discriminated | -0.11 | -0.11 | -0.11 | -0.11 |
|  | (0.51) | (0.51) | (0.51) | (0.51) |
| Wealth Ratio | -0.30 | -0.30 | -0.30 | -0.30 |
|  | (0.32) | (0.32) | (0.32) | (0.32) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.01 | 0.01 | 0.01 | 0.01 |
|  | (0.10) | (0.10) | (0.10) | (0.10) |
| Irredentist Soviet | -1.11\* | -1.11\* | -1.11\* | -1.11\* |
|  | (0.57) | (0.57) | (0.57) | (0.57) |
| Host Soviet | 0.23 | 0.23 | 0.23 | 0.23 |
|  | (0.47) | (0.47) | (0.47) | (0.47) |
| Peace years | -1.43\*\*\* | -1.43\*\*\* | -1.43\*\*\* | -1.43\*\*\* |
|  | (0.22) | (0.22) | (0.22) | (0.22) |
| Peace years2 | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | -0.41 | -2.15\*\*\* | -1.73\* | -0.27 |
|  | (0.67) | (0.72) | (0.89) | (0.67) |
|  |  |  |  |  |
| Observations | 3,527 | 3,527 | 3,527 | 3,527 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

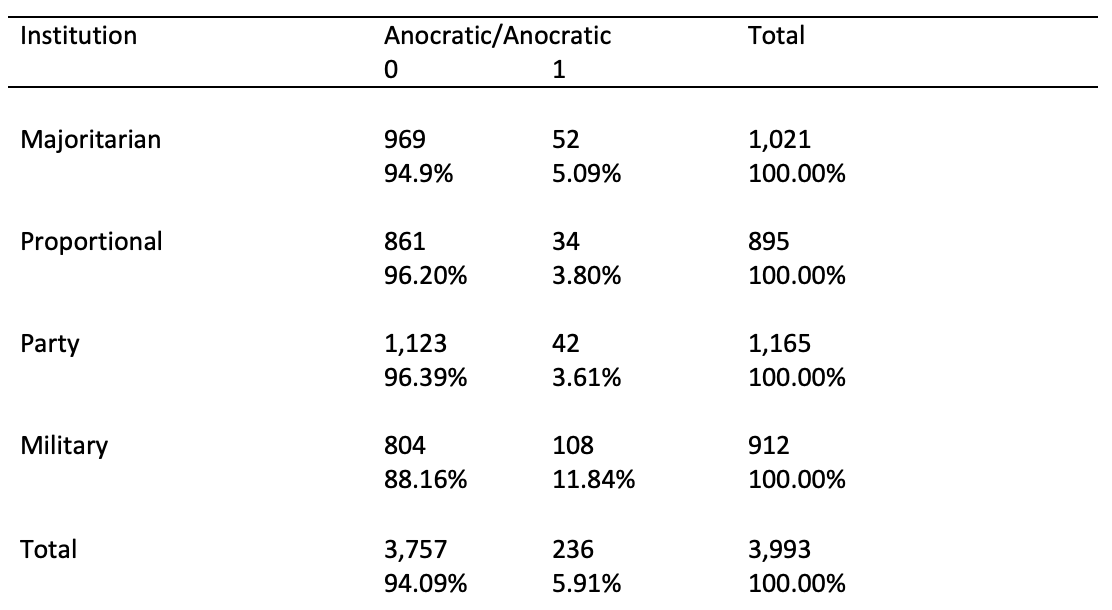
Appendix Table 6: Removal of Anocracy and Soviet Controls

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| VARIABLES | Majoritarian | Proportional | Party | Military/Personal |
|  |  |  |  |  |
| 1.Majoritarian |  | 1.44\*\*\* | 1.26\*\*\* | -0.01 |
|  |  | (0.54) | (0.49) | (0.47) |
| 2.Proportional | -1.44\*\*\* |  | -0.18 | -1.46\*\*\* |
|  | (0.54) |  | (0.51) | (0.47) |
| 3.Party | -1.26\*\*\* | 0.18 |  | -1.28\*\* |
|  | (0.49) | (0.51) |  | (0.52) |
| 4.Military | 0.01 | 1.46\*\*\* | 1.28\*\* |  |
|  | (0.47) | (0.47) | (0.52) |  |
| Margin | 0.13 | 0.13 | 0.13 | 0.13 |
|  | (0.68) | (0.68) | (0.68) | (0.68) |
| Dispersed | -1.71 | -1.71 | -1.71 | -1.71 |
|  | (1.10) | (1.10) | (1.10) | (1.10) |
| Discrminated | 0.25 | 0.25 | 0.25 | 0.25 |
|  | (0.51) | (0.51) | (0.51) | (0.51) |
| Wealth Ratio | -0.41 | -0.41 | -0.41 | -0.41 |
|  | (0.33) | (0.33) | (0.33) | (0.33) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.01 | 0.01 | 0.01 | 0.01 |
|  | (0.10) | (0.10) | (0.10) | (0.10) |
| Peace years | -1.47\*\*\* | -1.47\*\*\* | -1.47\*\*\* | -1.47\*\*\* |
|  | (0.21) | (0.21) | (0.21) | (0.21) |
| Peace years2 | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | 0.85 | -0.60 | -0.42 | 0.86\* |
|  | (0.59) | (0.63) | (0.62) | (0.50) |
|  |  |  |  |  |
| Observations | 3,681 | 3,681 | 3,681 | 3,681 |

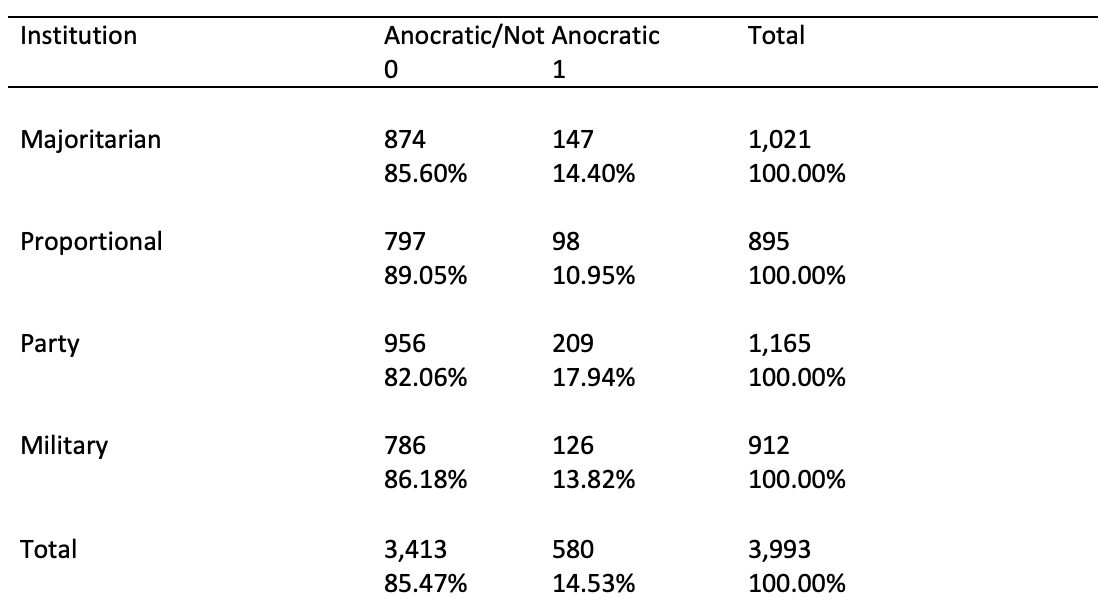
Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

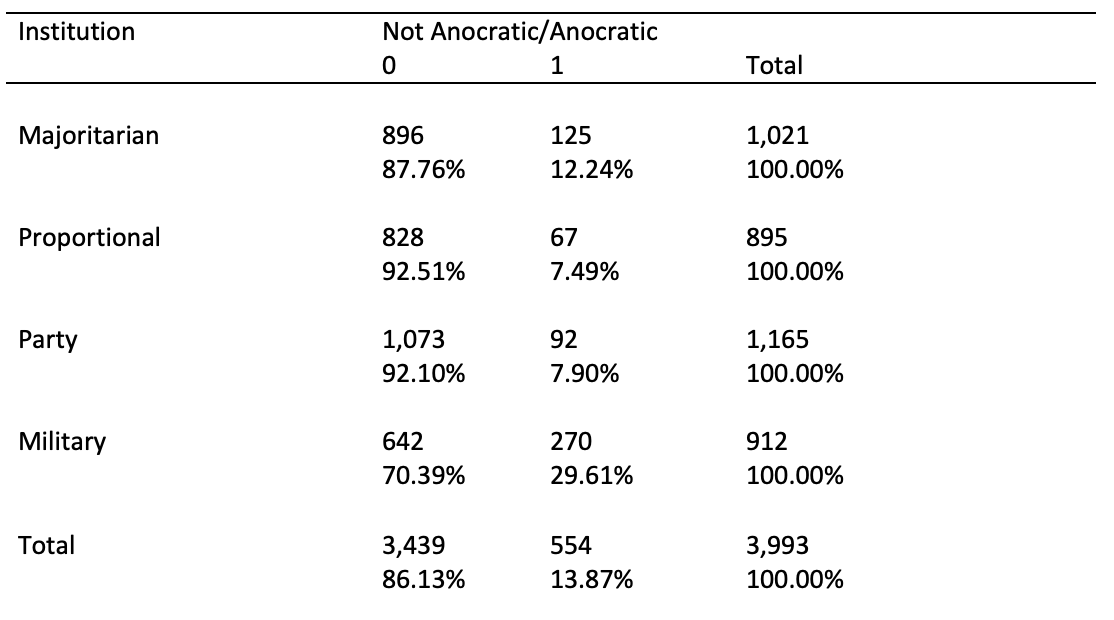
Appendix Table 7a: Anocratic/Anocratic by Institution



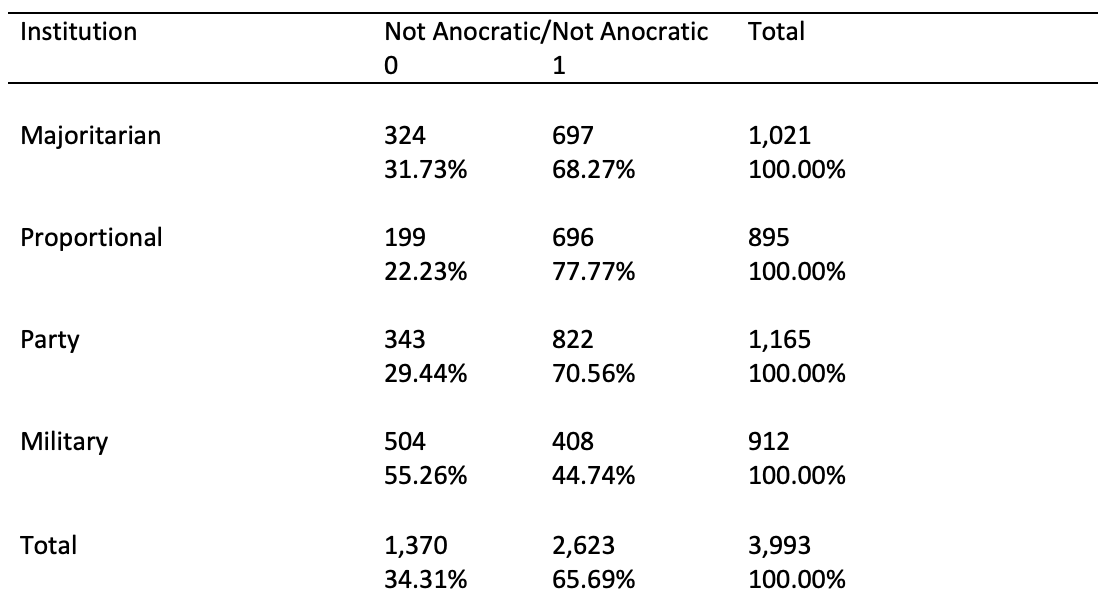
Appendix Table 7b: Anocratic/Not Anocratic by Institution



Appendix Table 7c: Not Anocratic/Anocratic by Institution



Appendix Table 7d: Not Anocratic/Not Anocratic by Institution



Appendix Table 8a: Crosscutting Cleavages; Group-Level Economic Controls

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| VARIABLES | Majoritarian | Proportional | Party | Military/Personal | Majoritarian | Proportional | Party | Military/Personal |
|  |  |  |  |  |  |  |  |  |
| 1.Majoritarian |  | 2.69\*\*\* | 1.64\*\* | 0.02 |  | 3.00\*\*\* | 1.10\*\* | -0.04 |
|  |  | (0.94) | (0.79) | (0.62) |  | (0.82) | (0.54) | (0.61) |
| 2.Proportional | -2.69\*\*\* |  | -1.05 | -2.68\*\*\* | -3.00\*\*\* |  | -1.90\*\* | -3.04\*\*\* |
|  | (0.94) |  | (1.17) | (1.04) | (0.82) |  | (0.89) | (0.90) |
| 3.Party | -1.64\*\* | 1.05 |  | -1.63\*\* | -1.10\*\* | 1.90\*\* |  | -1.14\*\* |
|  | (0.79) | (1.17) |  | (0.83) | (0.54) | (0.89) |  | (0.57) |
| 4.Military | -0.02 | 2.68\*\*\* | 1.63\*\* |  | 0.04 | 3.04\*\*\* | 1.14\*\* |  |
|  | (0.62) | (1.04) | (0.83) |  | (0.61) | (0.90) | (0.57) |  |
| Crosscutting | -1.49 | -1.49 | -1.49 | -1.49 |  |  |  |  |
|  | (1.86) | (1.86) | (1.86) | (1.86) |  |  |  |  |
| High Inequality |  |  |  |  | -3.79\*\*\* | -3.79\*\*\* | 3.79\*\*\* | -3.79\*\*\* |
|  |  |  |  |  | (1.10) | (1.10) | (1.10) | (1.10) |
| Low Inequality |  |  |  |  | -3.17\*\*\* | -3.17\*\*\* | 3.17\*\*\* | -3.17\*\*\* |
|  |  |  |  |  | (1.06) | (1.06) | (1.06) | (1.06) |
| Group Wealth Ratio |  |  |  |  | 1.01\*\*\* | 1.01\*\*\* | 1.01\*\*\* | 1.01\*\*\* |
|  |  |  |  |  | (0.32) | (0.32) | (0.32) | (0.32) |
| Anocracy/Anocracy | 2.13\*\*\* | 2.13\*\*\* | 2.13\*\*\* | 2.13\*\*\* | 2.03\*\*\* | 2.03\*\*\* | 2.03\*\*\* | 2.03\*\*\* |
|  | (0.57) | (0.57) | (0.57) | (0.57) | (0.69) | (0.69) | (0.69) | (0.69) |
| Anocracy/No | 0.97 | 0.97 | 0.97 | 0.97 | 1.50\*\*\* | 1.50\*\*\* | 1.50\*\*\* | 1.50\*\*\* |
|  | (0.61) | (0.61) | (0.61) | (0.61) | (0.57) | (0.57) | (0.57) | (0.57) |
| No/Anocracy | 0.68\*\* | 0.68\*\* | 0.68\*\* | 0.68\*\* | 0.39 | 0.39 | 0.39 | 0.39 |
|  | (0.28) | (0.28) | (0.28) | (0.28) | (0.32) | (0.32) | (0.32) | (0.32) |
| Margin | -0.06 | -0.06 | -0.06 | -0.06 | 1.60\* | 1.60\* | 1.60\* | 1.60\* |
|  | (0.90) | (0.90) | (0.90) | (0.90) | (0.83) | (0.83) | (0.83) | (0.83) |
| Dispersed | -0.89 | -0.89 | -0.89 | -0.89 | -0.49 | -0.49 | -0.49 | -0.49 |
|  | (1.23) | (1.23) | (1.23) | (1.23) | (1.30) | (1.30) | (1.30) | (1.30) |
| Discriminated | -0.89 | -0.89 | -0.89 | -0.89 | -1.20\*\* | -1.20\*\* | -1.20\*\* | -1.20\*\* |
|  | (0.60) | (0.60) | (0.60) | (0.60) | (0.61) | (0.61) | (0.61) | (0.61) |
| Wealth Ratio | -0.04 | -0.04 | -0.04 | -0.04 | -1.41\*\*\* | -1.41\*\*\* | 1.41\*\*\* | -1.41\*\*\* |
|  | (0.31) | (0.31) | (0.31) | (0.31) | (0.51) | (0.51) | (0.51) | (0.51) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.01 | 0.01 | 0.01 | 0.01 | 0.13 | 0.13 | 0.13 | 0.13 |
|  | (0.13) | (0.13) | (0.13) | (0.13) | (0.11) | (0.11) | (0.11) | (0.11) |
| Irredentist Soviet | -0.86 | -0.86 | -0.86 | -0.86 | -1.51\* | -1.51\* | -1.51\* | -1.51\* |
|  | (0.73) | (0.73) | (0.73) | (0.73) | (0.79) | (0.79) | (0.79) | (0.79) |
| Host Soviet | 0.51 | 0.51 | 0.51 | 0.51 | 0.90 | 0.90 | 0.90 | 0.90 |
|  | (0.63) | (0.63) | (0.63) | (0.63) | (0.78) | (0.78) | (0.78) | (0.78) |
| Peace years | -1.71\*\*\* | -1.71\*\*\* | 1.71\*\*\* | -1.71\*\*\* | -1.51\*\*\* | -1.51\*\*\* | 1.51\*\*\* | -1.51\*\*\* |
|  | (0.37) | (0.37) | (0.37) | (0.37) | (0.30) | (0.30) | (0.30) | (0.30) |
| Peace years2 | 0.11\*\*\* | 0.11\*\*\* | 0.11\*\*\* | 0.11\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.03) | (0.03) | (0.03) | (0.03) | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | 0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | 0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | 1.44 | -1.25 | -0.20 | 1.43 | 3.46\*\* | 0.46 | 2.36\* | 3.51\*\*\* |
|  | (1.36) | (1.36) | (1.14) | (1.28) | (1.52) | (1.25) | (1.38) | (1.29) |
| Observations | 3,218 | 3,218 | 3,218 | 3,218 | 2,611 | 2,611 | 2,611 | 2,611 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 8b: Proportional Systems / Ethnic Interactions

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
| VARIABLES | Proportional/Ethnic | Proportional/Religious | Proportional/Crosscut |
| 2.Proportional | -0.03 | -1.46\* | -5.23\* |
|  | (0.81) | (0.86) | (2.79) |
| 3.Party | -1.37\*\* | -1.52\*\* | -1.64\*\* |
|  | (0.64) | (0.67) | (0.79) |
| 4.Military | 0.05 | 0.16 | -0.01 |
|  | (0.67) | (0.62) | (0.62) |
| Ethnic Fractionalization | 1.85 |  |  |
|  | (2.32) |  |  |
| ProportionXEthnic | -93.80\*\*\* |  |  |
|  | (23.71) |  |  |
| Religious Fractionalization |  | -1.22 |  |
|  |  | (1.20) |  |
| ProportionXReligious |  | -19.31\*\*\* |  |
|  |  | (7.22) |  |
| Crosscutting |  |  | -1.58 |
|  |  |  | (1.91) |
| ProportionXCrosscutting |  |  | 3.55 |
|  |  |  | (3.08) |
| Anocratic/Anocratic | 2.23\*\*\* | 2.10\*\*\* | 2.12\*\*\* |
|  | (0.54) | (0.59) | (0.57) |
| Anocratic/No | 0.92 | 0.91 | 0.93 |
|  | (0.58) | (0.59) | (0.60) |
| No/Anocratic | 0.57\*\* | 0.62\*\* | 0.67\*\* |
|  | (0.29) | (0.25) | (0.27) |
| Margin | 1.82 | -0.24 | -0.03 |
|  | (2.14) | (0.90) | (0.92) |
| Dispersed | -1.07 | -1.00 | -0.88 |
|  | (1.17) | (1.31) | (1.23) |
| Discriminated | -0.79 | -0.89 | -0.90 |
|  | (0.69) | (0.67) | (0.61) |
| Wealth Ratio | 0.11 | -0.06 | -0.04 |
|  | (0.33) | (0.35) | (0.31) |
| Host Population | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.06 | 0.03 | 0.02 |
|  | (0.14) | (0.14) | (0.14) |
| Irredentist Soviet | -0.73 | -0.72 | -0.88 |
|  | (0.75) | (0.80) | (0.73) |
| Host Soviet | 0.50 | 0.26 | 0.51 |
|  | (0.61) | (0.63) | (0.64) |
| Peace years | -1.76\*\*\* | -1.73\*\*\* | -1.71\*\*\* |
|  | (0.41) | (0.40) | (0.37) |
| Peace years2 | 0.11\*\*\* | 0.11\*\*\* | 0.11\*\*\* |
|  | (0.03) | (0.03) | (0.03) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) |
| Constant | -1.50 | 0.96 | 1.49 |
|  | (1.97) | (1.15) | (1.38) |
| Observations | 3,310 | 3,218 | 3,218 |

Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 9: Host State Controls

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| VARIABLES | Fract Majoritarian | Fract Proportional | Fract Party | Fract  Military | # Majoritarian | # Proportional | # Party | # Military |
| 1.Majoritarian |  | 1.60\*\*\* | 1.22\*\* | 0.00 |  | 1.72\*\*\* | 1.06\*\* | 0.06 |
|  |  | (0.55) | (0.59) | (0.54) |  | (0.54) | (0.52) | (0.53) |
| 2.Proportional | -1.60\*\*\* |  | -0.38 | -1.60\*\*\* | -1.72\*\*\* |  | -0.66 | -1.65\*\*\* |
|  | (0.55) |  | (0.59) | (0.49) | (0.54) |  | (0.59) | (0.55) |
| 3.Party | -1.22\*\* | 0.38 |  | -1.22\*\* | -1.06\*\* | 0.66 |  | -0.99\*\* |
|  | (0.59) | (0.59) |  | (0.52) | (0.52) | (0.59) |  | (0.51) |
| 4.Military | -0.00 | 1.60\*\*\* | 1.22\*\* |  | -0.06 | 1.65\*\*\* | 0.99\*\* |  |
|  | (0.54) | (0.49) | (0.52) |  | (0.53) | (0.55) | (0.51) |  |
| Host Fractionalization | 1.81\*\* | 1.81\*\* | 1.81\*\* | 1.81\*\* |  |  |  |  |
|  | (0.91) | (0.91) | (0.91) | (0.91) |  |  |  |  |
| Host # Groups |  |  |  |  | 0.18\*\*\* | 0.18\*\*\* | 0.18\*\*\* | 0.18\*\*\* |
|  |  |  |  |  | (0.06) | (0.06) | (0.06) | (0.06) |
| Anoc/Anocracy | 1.87\*\*\* | 1.87\*\*\* | 1.87\*\*\* | 1.87\*\*\* | 1.98\*\*\* | 1.98\*\*\* | 1.98\*\*\* | 1.98\*\*\* |
|  | (0.49) | (0.49) | (0.49) | (0.49) | (0.46) | (0.46) | (0.46) | (0.46) |
| Anocracy/No | 0.98\*\* | 0.98\*\* | 0.98\*\* | 0.98\*\* | 1.04\*\* | 1.04\*\* | 1.04\*\* | 1.04\*\* |
|  | (0.46) | (0.46) | (0.46) | (0.46) | (0.47) | (0.47) | (0.47) | (0.47) |
| No/Anocracy | 0.69\*\*\* | 0.69\*\*\* | 0.69\*\*\* | 0.69\*\*\* | 0.67\*\* | 0.67\*\* | 0.67\*\* | 0.67\*\* |
|  | (0.26) | (0.26) | (0.26) | (0.26) | (0.30) | (0.30) | (0.30) | (0.30) |
| Margin | 0.73 | 0.73 | 0.73 | 0.73 | 0.86\* | 0.86\* | 0.86\* | 0.86\* |
|  | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) |
| Dispersed | -1.15 | -1.15 | -1.15 | -1.15 | -0.93 | -0.93 | -0.93 | -0.93 |
|  | (1.09) | (1.09) | (1.09) | (1.09) | (1.19) | (1.19) | (1.19) | (1.19) |
| Discriminated | -0.18 | -0.18 | -0.18 | -0.18 | -0.24 | -0.24 | -0.24 | -0.24 |
|  | (0.52) | (0.52) | (0.52) | (0.52) | (0.57) | (0.57) | (0.57) | (0.57) |
| Wealth Ratio | -0.21 | -0.21 | -0.21 | -0.21 | -0.18 | -0.18 | -0.18 | -0.18 |
|  | (0.31) | (0.31) | (0.31) | (0.31) | (0.36) | (0.36) | (0.36) | (0.36) |
| Host Population | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Irredentist Population | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Power Disparity | 0.08 | 0.08 | 0.08 | 0.08 | 0.06 | 0.06 | 0.06 | 0.06 |
|  | (0.12) | (0.12) | (0.12) | (0.12) | (0.12) | (0.12) | (0.12) | (0.12) |
| Irredentist Soviet | -0.30 | -0.30 | -0.30 | -0.30 | -0.19 | -0.19 | -0.19 | -0.19 |
|  | (0.62) | (0.62) | (0.62) | (0.62) | (0.61) | (0.61) | (0.61) | (0.61) |
| Host Soviet | 0.46 | 0.46 | 0.46 | 0.46 | 0.43 | 0.43 | 0.43 | 0.43 |
|  | (0.50) | (0.50) | (0.50) | (0.50) | (0.52) | (0.52) | (0.52) | (0.52) |
| Peace years | -1.47\*\*\* | -1.47\*\*\* | -1.47\*\*\* | -1.47\*\*\* | -1.44\*\*\* | -1.44\*\*\* | -1.44\*\*\* | -1.44\*\*\* |
|  | (0.25) | (0.25) | (0.25) | (0.25) | (0.25) | (0.25) | (0.25) | (0.25) |
| Peace years2 | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* | 0.09\*\*\* |
|  | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Constant | -1.31 | -2.91\*\*\* | -2.53\*\*\* | -1.31 | -1.78\*\* | -3.50\*\*\* | -2.84\*\*\* | -1.84\*\* |
|  | (0.98) | (0.79) | (0.80) | (0.84) | (0.81) | (0.76) | (0.81) | (0.82) |
|  |  |  |  |  |  |  |  |  |
| Observations | 3,527 | 3,527 | 3,527 | 3,527 | 3,527 | 3,527 | 3,527 | 3,527 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Appendix Table 10: Model Performance

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
| VARIABLES | Original | NewInst | Interact |
| 1.Majoritarian | -2.72\*\* | -0.51 | -4.63\*\* |
|  | (1.34) | (0.62) | (2.14) |
| 2.Proportional |  | -3.67\*\*\* | -3.51\*\*\* |
|  |  | (1.02) | (1.04) |
| 3.Party |  | -1.52\*\* | -1.77\*\*\* |
|  |  | (0.61) | (0.65) |
| Margin | -0.37 | 1.46 | 0.53 |
|  | (0.64) | (0.95) | (1.08) |
| MajoritarianXMargin | 5.06\*\* |  | 5.56\* |
|  | (2.05) |  | (2.86) |
| Dispersed | -0.45 | -0.80 | -0.61 |
|  | (1.38) | (1.62) | (1.61) |
| High Inequality | -3.17\*\*\* | -3.67\*\*\* | -4.05\*\*\* |
|  | (0.98) | (1.09) | (1.10) |
| Low Inequality | -2.29\*\* | -2.53\*\* | -2.67\*\* |
|  | (0.93) | (1.08) | (1.09) |
| Discriminated | -0.92 | -1.15\* | -1.01\* |
|  | (0.61) | (0.62) | (0.60) |
| Wealth Ratio | -0.22 | -0.12 | -0.23 |
|  | (0.34) | (0.35) | (0.36) |
| Anocracy/Anocracy | 2.34\*\*\* | 2.04\*\*\* | 2.08\*\*\* |
|  | (0.59) | (0.62) | (0.60) |
| Anocracy/No | 0.97\*\* | 1.52\*\*\* | 1.54\*\*\* |
|  | (0.47) | (0.55) | (0.57) |
| No/Anocracy | 0.20 | 0.45 | 0.37 |
|  | (0.28) | (0.28) | (0.25) |
| Host Population | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) |
| Irredentist Population | 0.00 | -0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) |
| Power Disparity | -0.04 | -0.05 | -0.11 |
|  | (0.12) | (0.13) | (0.14) |
| Irredentist Soviet | -0.76 | -1.63\*\* | -2.13\*\*\* |
|  | (0.53) | (0.69) | (0.64) |
| Host Soviet | -0.02 | 0.53 | 0.62 |
|  | (0.60) | (0.63) | (0.66) |
| Peace years | -1.54\*\*\* | -1.56\*\*\* | -1.56\*\*\* |
|  | (0.30) | (0.32) | (0.32) |
| Peace years2 | 0.10\*\*\* | 0.10\*\*\* | 0.10\*\*\* |
|  | (0.02) | (0.03) | (0.03) |
| Peace years3 | -0.00\*\*\* | -0.00\*\*\* | -0.00\*\*\* |
|  | (0.00) | (0.00) | (0.00) |
| Constant | 2.66\*\* | 3.40\*\* | 4.30\*\*\* |
|  | (1.26) | (1.34) | (1.32) |
| Observations | 2,934 | 2,934 | 2,934 |
| BIC | 500.075 | 491.954 | 494.818 |
| AIC | 380.393 | 366.288 | 363.167 |
| Log likelihood | -170.196 | -162.144 | -159.583 |
| F1 Score | 0.750 | 0.778 | 0.784 |
| MCC | 0.740 | 0.770 | 0.775 |
| AUC | 0.976 | 0.976 | 0.977 |

Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

7. Model Sensitivity Analyses

In this section of the appendix, we assess the robustness of our computational model when we systematically vary what had been fixed parameters in our primary model. These parameters included the patches of territory in the model, the number of rounds utilized per model run, the median transfer preferences, and others as detailed in Appendix Table 11 below. Appendix Table 11 further details the parameter values used in the default model under the “Default Value” heading.

While keeping all other parameters constant at their default values, we run our analyses assessing the impact of our four institutional types while changing one default parameter value at a time. For example, we vary all four of our institutional types while keeping all default parameter values the same except for changing patches of territory from 1,089 to 841, as signified by the row “Patches of Territory” in table 11 below. We then vary all four institutional types while keeping all default parameter values the same except for changing patches of territory to 1,369. This procedure helps us assess whether our model results are sensitive to the default parameter values we included in our main model analyses. Because running 100 rounds of the model produced the same irredentist patterns as the 200 rounds, we used for the model in the main text, we ran all sensitivity analyses for 100 rounds.

Appendix Figure 3 graphically presents the results of each parameter change across several pages, and these can be compared against our model results with our primary default model results presented in Appendix Figure 1 presented earlier in this appendix. We engage in some discussion of these results following the presentation of Figure 3.

Appendix Table 11: Default Model Values

|  |  |  |
| --- | --- | --- |
| Variables held constant | Default Value | Sensitivity Check |
| Patches of Territory[[31]](#footnote-31) | 1,089 | 841; 1,369 |
| Rounds per Model Run | 200 | 100; 250 |
| Dispersion | 10 | 5; 15 |
| *N* – Number of Nations | 10 | 8; 12 |
| *I* – Number of Individuals | 50 | 25; 75 |
| – Median Transfer Preferences | 0.5 | 0.25, 0.75 |
| – Median Public Goods Preferences | 0.5 | 0.75; 0.25 |
| *hi* – Preference Heterogeneity | 1.5 | 1.2; 1.8 |
| *ei* – Nation Preference Heterogeneity | 1.5 | 1.2; 1.8 |
| – Distance Scale Correction | 5 | 2, 8 |
| – Public Goods/Transfer Scale Correction | 300 | 200, 600 |
| *ps* – Starting Proportion of Private to Public | 0.5 | 0.25, 0.75 |

Appendix Figure 3: Graphical Results from Sensitivity Analysis



Discussion:

Across the vast majority of our analyses, the results follow the same pattern as those presented in the main text of the paper. We see that there are two clusters: majoritarian systems and military/personalist systems have higher incidences of irredentism than proportional electoral systems and single party authoritarian systems. Put differently, majoritarian systems and military/personalistic systems are not statistically differentiated from each other, but they are statistically differentiated from and see higher predicted irredentist events than proportional electoral systems and single party electoral systems, and these two latter systems also are not statistically differentiated from each other.

There are 3 models in the sensitivity analysis that do not follow this general pattern, although they do not deviate greatly, and they do not give us a great deal of pause. In each case, majoritarian and military personalistic systems have higher predicted values of irredentism than proportional electoral and single party systems, but proportional and military systems are occasionally not statistically differentiated from each other. The models that deviate slightly from the typical model include: 1) when the level of dispersion is set to 5 (rather than the default value of 10), 2) when the number of individuals is set to 75 (rather than the default value of 50), and 3) when the public goods correction is set to 200 (rather than the default value of 300).

When the level of dispersion is set to 5, we are not surprised to see that this setting produces some mild degree of difference from our main results. To have irredentism, there need to be opportunities for it. With nations clustered more tightly together, there are fewer opportunities (and subsequently incidences) of irredentism and thus fewer opportunities for the various political regimes to differentiate themselves. The general pattern, however, is largely the same except that proportional electoral systems are not statistically differentiated from military/personalistic authoritarian regimes.

When the number of individuals in each nation is set to 75 and when the public goods correction is set to 200, we see that while military/personalistic regimes have a higher number of predicted irredentist events in the model than proportional electoral systems, that difference is not statistically significant. Military/personalistic regimes often having the highest number of predicted irredentist events, but they also demonstrate the greatest variability across model runs. It may be that when the prediction is on the low end of this spectrum, there is a tendency for military/personalistic regimes to not be statistically differentiated from proportional electoral systems.

7a. Multiple Interacting Regimes

Our primary model looks at interacting states who all share the same regime type. We do this for two reasons. First, it allows us to experimentally isolate the impact of regime type. Second, it allows a more efficient means to run our various model analyses. However, some readers may wonder the extent to which our results might change if we examined a world of interacting states who shared different regime characteristics.

To assesses this, we ran a version of our model with all the same attributes as the main model described in this appendix. However, rather than look at a world of 10 interacting states of all the same regime type, we ran one thousand iterations of a model where the regime type for each of the interacting states was randomly chosen between majoritarian, proportional, single-party, and military. We ran 1,000 model iterations to approximately match the number of total observations for each regime in our main model analyses.

To further clarify with an example, consider that in our original model we ran 200 iterations of a model with 10 interacting majoritarian states. This provided us with 10 examples of majoritarian regimes in each run and subsequently 2,000 total observations across 200 model iterations. However, in the model runs with 10 states where the regime type of each state is randomly chosen, we had an average of between 2 and 3 majoritarian observations in each model run. To approach 2,000 total observations, we needed to run 1,000 model iterations. We tracked, as separate variables, the number of irredentist instances from each regime type across 1,000 model runs.

Appendix Table 12(a-d) below presents summary statistics and paired t tests for all paired variable combinations. The summary statistics in Appendix Table 12a inform us that for each model run of 10 interacting states averaged slightly less than 1 act of irredentism (0.979) across 1,000 runs. Majoritarian regimes averaged 0.33 acts of irredentism per model run, proportional regimes averaged 0.177 acts of irredentism, while single-party and military regimes averaged 0.149 and 0.323 acts of irredentism per model run, respectively. These results closely mirror the results of our main models in that majoritarian and military regimes average relatively high propensities for irredentism while proportional and single-party regimes average relatively low propensities for irredentism.

To assess the statistical significance of these differences, Appendix Tables 12b through 12c present paired t tests. Appendix Table 12b demonstrates whether statistically significant differences exist between majoritarian regimes against proportional, single party, and military regimes. We see majoritarian regimes have a statistically different and higher irredentist events than both proportional and single party regimes, while, as in the main models, there is not statistically significant difference between majoritarian and military regimes. Similarly, Appendix Table 12c demonstrates that proportional systems are not statistically differentiated from single party dictatorships, but they have fewer instances of irredentism than military regimes and this difference is statistically significant. Finally, Appendix Table 12d demonstrates that single party dictatorships have significantly fewer instances of irredentism than do military regimes. There is no table for military regimes as, obviously, its paired comparisons have already been examined by the previous tables. All results are consistent with the predictions coming from our primary model.

Appendix Table 12a: Summary Statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean Irred. | Std. Dev. | Min | Max |
| Total Incidences | 1,000 | .979 | 2.015595 | 0 | 16 |
| Majoritarian | 1,000 | .33 | 1.210192 | 0 | 16 |
| Proportional | 1,000 | .177 | .7267731 | 0 | 13 |
| Party | 1,000 | .149 | .7651042 | 0 | 13 |
| Military | 1,000 | .323 | 1.140163 | 0 | 11 |

Appendix Table 12b: Majoritarian Paired Reference

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean Irred. | Std. Err. | Std. Dev. | [95% Conf. | Interval] |
| Maj. | 1,000 | .33 | .0382696 | 1.210192 | .2549019 | .4050981 |
| Proportion. | 1,000 | .177 | .0229826 | .7267731 | .1319003 | .2220997 |
| diff | 1,000 | .153 | .0433759 | 1.371668 | .0678816 | .2381184 |

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.9998 Pr(T > t) = 0.0004 Pr(T > t) = 0.0002

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean Irred. | Std. Err. | Std. Dev. | [95% Conf. | Interval] |
| Maj. | 1,000 | .33 | .0382696 | 1.210192 | .2549019 | .4050981 |
| Party | 1,000 | .149 | .0241947 | .7651042 | .1015217 | .1964783 |
| diff | 1,000 | .181 | .0453464 | 1.433979 | .0920149 | .2699851 |

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 1.0000 Pr(T > t) = 0.0001 Pr(T > t) = 0.0000

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean Irred. | Std. Err. | Std. Dev. | [95% Conf. | Interval] |
| Maj. | 1,000 | .33 | .0382696 | 1.210192 | .2549019 | .4050981 |
| Military | 1,000 | .323 | .0360551 | 1.140163 | .2522476 | .3937524 |
| diff | 1,000 | .007 | .0531204 | 1.679813 | -.0972403 | .1112403 |

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.5524 Pr(T > t) = 0.8952 Pr(T > t) = 0.4476

Appendix Table 12c: Proportional Paired Reference

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean Irred. | Std. Err. | Std. Dev. | [95% Conf. | Interval] |
| Proportion. | 1,000 | .177 | .0229826 | .7267731 | .1319003 | .2220997 |
| Party | 1,000 | .149 | .0241947 | .7651042 | .1015217 | .1964783 |
| diff | 1,000 | .028 | .0333816 | 1.055618 | -.0375061 | .0935061 |

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.7991 Pr(T > t) = 0.4018 Pr(T > t) = 0.2009

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean Irred. | Std. Err. | Std. Dev. | [95% Conf. | Interval] |
| Proportion. | 1,000 | .177 | .0229826 | .7267731 | .1319003 | .2220997 |
| Military | 1,000 | .323 | .0360551 | 1.140163 | .2522476 | .3937524 |
| diff | 1,000 | -.146 | .0411628 | 1.301683 | -.2267755 | -.0652245 |

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.0002 Pr(T > t) = 0.0004 Pr(T > t) = 0.9998

Appendix Table 12d: Party Paired Reference

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean Irred. | Std. Err. | Std. Dev. | [95% Conf. | Interval] |
| Party | 1,000 | .149 | .0241947 | .7651042 | .1015217 | .1964783 |
| Military | 1,000 | .323 | .0360551 | 1.140163 | .2522476 | .3937524 |
| diff | 1,000 | -.174 | .0433775 | 1.371716 | -.2591214 | -.0888786 |

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.0000 Pr(T > t) = 0.0001 Pr(T > t) = 1.0000

1. There is no set period of time for the Prehistory. The Prehistory is in effect until all units of territory have been incorporated into a state. [↑](#footnote-ref-1)
2. Each stylized state is divided into three subnational districts that are represented in the national legislature and that are responsible for supplying public goods to citizens. We build on the model provided by Milesi-Ferretti, Perotti, and Rostagno (2002), which also assumes three stylized districts in each nation-state. [↑](#footnote-ref-2)
3. We certainly do not claim that such ethnic, or national, identities are immutably fixed or that they cannot be changed. We also recognize individuals may take on multiple identities, the implications of which are at least partially captured within our model by individuals sharing heterogeneous preferences (as described below) even within their particular national groups. [↑](#footnote-ref-3)
4. The world is “closed,” which means agents located on the boundaries do not interact with agents on the other side of the world. [↑](#footnote-ref-4)
5. Dispersion is constrained by being within 10 patches of the capitol. The simulation places 10 capitols randomly across the 1,089 patches of territory. Each nation initially consists of approximately 50 individuals. Across 10 nations that means the model includes approximately 500 individuals. [↑](#footnote-ref-5)
6. Of course, in reality geographic territories likely possess substantially different resource endowments and populations with important implications for the political development of states. Our aim here is to create a system of interacting states where individuals who identify with one nation find themselves within another nation-state’s borders. Modeling every factor that would contribute to the relative strength and political development of nation states is (far) beyond our goals. [↑](#footnote-ref-6)
7. As in Cederman’s model, the capitol of each state has both fixed and mobile resources. “A preset share of each actors’ resources is considered to be fixed and has to be evenly spread to all external fronts.” Unlike Cederman’s model, resources are not sent to fronts based on the opponent’s strength or previous activity on the front. [↑](#footnote-ref-7)
8. Some may find this to be a gross oversimplification of the policy-making process. Clearly some degree of public goods is provided by national states to peripheral regions even if they are not influential in setting national policy. This is intended as a stylized and simplified version of the allocation of public goods and transfers. Whether marginalized districts receive some smaller share of public goods is immaterial to the model’s results. [↑](#footnote-ref-8)
9. The capitol makes similar calculations of public goods, transfers, and the tax rate during the prehistory. However, the implications of those decisions only become relevant to the model once the prehistory is over. [↑](#footnote-ref-9)
10. See Milesi-Ferretti et al. (2002) for how the capitol arrives at these different calculations for majoritarian and proportional systems. [↑](#footnote-ref-10)
11. For the sake of space, here we only demonstrate how majoritarian capitols decide upon the tax rate based on majoritarian median preferences for transfers and public goods (). The proportional calculations work similarly except we replace () with (). [↑](#footnote-ref-11)
12. We want to be clear that it is not our intention to recreate all the implications of selectorate theory here. While it provides a very useful starting point for modeling individual utilities, we are interested in the differential impacts of transfers versus public goods which necessitates revising that general framework. Selectorate theory and the frameworks provided by both Milesi-Ferretti et al. and Alesina and Spolaore think about public goods in different ways. We combine their insights for our own explanation that draws from each. In our framework, state leadership can provide either private goods or, if they decide not to do so, can provide funds to either transfers or geographically fixed public goods, and the preferences for these public goods vary systematically across ethnic groups. [↑](#footnote-ref-12)
13. Majoritarian systems fund one transfer while proportional systems fund two transfers. [↑](#footnote-ref-13)
14. The individual utility from capitol spending on transfers (sj) equals total revenue (vs) multiplied by the proportion of capitol spending devoted to transfers ( in majoritarian systems, in proportional systems). [↑](#footnote-ref-14)
15. The capitol calculates the value of goods and transfers it provides if it either raises (*RAISEsj*and *RAISEgk* ) or lowers (LOWER*sj* and *LOWERgk*) the tax rate. To do so, the capitol recalculates expected productivity (equation 5a) at higher and lower tax rates of interval is. It then recalculates expected revenue (equation 6) at higher and lower tax rates, and the revenue expected from raising or lowering taxes is then multiplied by the proportion of spending devoted to transfers ( in majoritarian systems, in proportional systems) and public goods (ck). [↑](#footnote-ref-15)
16. Given the scale of units involved in the model, any act of irredentism has the potential to increase the utility of individual agents with regard to public goods to a degree that overwhelms any consideration of differences in transfers. To correct, we divide the impact of the distance between the individual preference for public goods and the median by . [↑](#footnote-ref-16)
17. In the models run for the paper, this ratio was initially set to an even 50/50 split. [↑](#footnote-ref-17)
18. As specified in equations 12 through 12e above. [↑](#footnote-ref-18)
19. Specifically to equation 12c [↑](#footnote-ref-19)
20. Equations 14d and 14e are identical to 12d and 12e above [↑](#footnote-ref-20)
21. We do not explicitly model the leader’s residual share of state resources after allocating resources to public goods and private goods as does selectorate theory because we see no compelling argument regarding its implications for irredentism. While engaging in irredentism may have implications for a leader’s immediate residual share of wealth, we contend leadership would be unlikely to engage in such an act if it risked angering the median member of his or her winning coalition and the long-term gains associated with leadership. The leader will keep the interests of the median member of the winning coalition in mind above all. [↑](#footnote-ref-21)
22. Bruce Bueno de Mesquita et al. (2003, 68) call this the ‘loyalty norm’. [↑](#footnote-ref-22)
23. We collected data from 200 simulated experimental runs from each of our four regime types. This resulted in a total of 800 model runs. We pooled these runs into a single dataset with each run representing a single observation. [↑](#footnote-ref-23)
24. During each round, each state decides upon a tax rate and then whether to annex territory with co-ethnics from neighboring states. [↑](#footnote-ref-24)
25. For example, in our assessment of military dictatorships, we examine the average count of irredentist events over 200 runs when ten military dictatorships interact with each other 200 individual rounds within each run. For military dictatorships, we set *S* to 0.02 (as a proportion of the population, ranging from 0 to 1) and *W* to 0.01 (small selectorate/small winning coalition). For single party dictatorships, we set S to 1 and W to 0.01 (large selectorate/small winning coalition). [↑](#footnote-ref-25)
26. Although rare, it is possible for the model world to establish itself in such a fashion that it structurally enables one state to take over the entire system, resulting in an inflated number of irredentist takeovers. This occurred in 1 of our 800 model runs, and we have removed the outliers in our main analyses where the number of irredentist takeovers was greater than 20, the top 0.12% of observations. Including the model run has no substantive impact on these results. [↑](#footnote-ref-26)
27. There are observations that are present in Siroky et al. 2017 and missing in Geddes, Wright, and Frantz (2014), and vice versa. Given our institutional variables are mutually exclusive categories interpreted in reference to each other, we coded any such observations as missing in the dataset presented in this paper. [↑](#footnote-ref-27)
28. In order to use software commands facilitating comparison of model fit statistics across our statistical models, we run a logit model, rather than rare events logit utilized by Siroky and Hale in the previous paper. Siroky and Hale note in the 2017 paper that the rare events logit results are nearly identical to logit results, and we demonstrate the same for the current model in Appendix Table 2. [↑](#footnote-ref-28)
29. In the primary models presented in the main text, Majoritarian systems are the omitted reference category. However, because we must interact the margin variable with majoritarian, majoritarian is included here, and Military is used as the omitted reference category. [↑](#footnote-ref-29)
30. Though included here, we do not run the asymmetric inequality variables utilized in Siroky and Hale (2017) or presented in Appendix Table 8 in in this paper’s main model. Their inclusion is not essential for the theoretical orientation of the paper and excluding them gains us several hundred observations. [↑](#footnote-ref-30)
31. The default 1,089 patches results from NetLogo’s default 33x33 grid. The sensitivity analysis assesses our results if we instead employ a 29x29 grid (841 patches) or a 37x37 grid (1,369 patches). [↑](#footnote-ref-31)