Online Appendix of "Cleavages, Party Organization, and Regional Parties in India"

<Table 1 : The list of national parties>

Abbreviation	Party Name	Primary Support Base
AAP	Aam Aadmi Party	Delhi
AIIC(T)	All India Indira Congress	
BJP	Bharatiya Janata Party	
BJS	Bharatiya Jana Sangh	
BLD	Bharatiya Lok Dal	Uttar Pradesh
BSP	Bahujan Samaj Party	Uttar Pradesh
CPI	Communist Party of India	
IC(S)	Indian Congress (Socialist)	Kerala
INC	Indian National Congress	
INC(U)	Indian National Congress (Urs)	
JD	Janata Dal	
JNP	Janata Party	
JNP(S)	Janata Party (Secular)	
KMPP	Kisan Mazdoor Praja Party	
LKD	Lok Dal	
NCO	Indian National Congress (Organisation)	
PSP	Praja Socialist Party	
RPI	Republican Party of India	Maharashtra
SCF	Schedule Cast Federation	
SJP	Samajwadi Janata Party	Uttar Pradesh
SP	Socialist Party	
SSP	Samyukta Socialist Party	
SWA	Swatantra Party	

Source: Ziegfled, Adam. 2016. *Why Regional Parties? Clentelism, Elites, and the Indian Party System*. Cambridge: Cambridge University Press.

Model Specification

I perform several tests to evaluate the robustness of our statistical model (Model 1). First, I use a χ^2/df test instead of the conventional χ^2 test. This approach addresses the limitations of the χ^2 test by incorporating degrees of freedom (df), which helps reduce the bias that tends to overestimate χ^2 values as the sample size increases. The resulting value is 1.97, which indicates a well-specified model if the value is less than 2 (Kline 2016). This result suggests that my model (estimated covariance matrix) aligns well with the data (input covariance matrix).

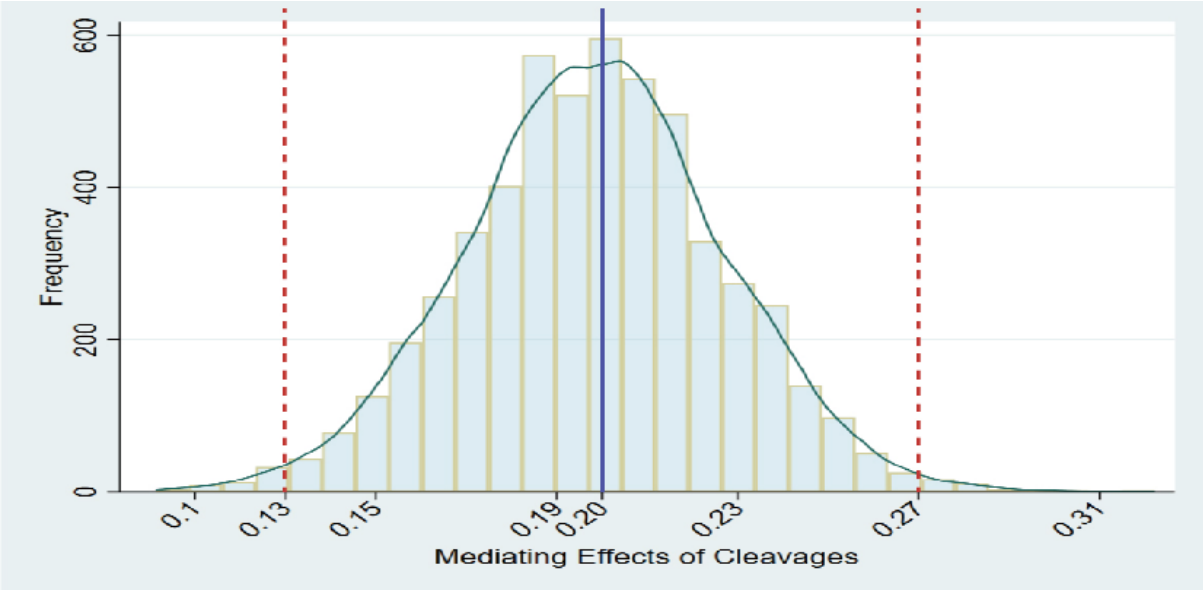
Next, using this method, I compare our model with an alternative model that excludes the direct effects of suffrage. This involves calculating the difference in χ^2 values and degrees of freedom (df) between the two models. Based on these differences, I obtain a p-value of 0.01. I interpret this result as evidence that the

existing model is superior to the alternative, as the constraint in the alternative model limits its ability to accurately specify the relationships in our data.

Third, I test this model using the Comparative Fit Index (CFI). While the χ^2 test evaluates how well my model approximates the data, the CFI measures the relative fit of my model compared to a null model, which assumes no correlation between variables. My test results indicate a CFI value of 0.96, suggesting that the model is well-specified, as a value of 1 represents perfect fit.

Given that one of my empirical contributions is the analysis of the mediating effects of party organization, I assess the robustness of this finding using the bootstrap method. This approach estimates the distribution of mediating effects by generating samples through 5,000 trials. As shown in Figure 3, I examine whether the confidence interval of estimated effects includes 0, which would indicate no effect. The results reveal that the confidence interval ranges from 0.13 (2.5th percentile) to 0.27 (97.5th percentile), with a mean of 0.2. This indicates that the mediating effects of party organization are robust.

<Figure 1: Distribution of Mediating Effects of Cleavages>



<Endnote: Solid Line: Mean / Dot Lines: 2.5th and 97.5th percentile>

Additional Tests

My measurement of cleavages in this manuscript focuses on the vertical relationship. While vertical relationship may capture regional variation relative to the national level, it shows limitation to account for intraregional dynamics. It needs to consider internal divisions (e.g. jatis) within a region, which may intensify heterogeneity beyond what is visible at the center–region level.

I realize that interacting my current measure with an indicator capturing inter-jati dynamics yields a more refined measurement of cleavages. This would better account for both vertical relationships and the layered nature of intraregional divisions.

However, there is limited data availability to capture these intra-regional dynamics. To address this, I introduce a reasonable proxy: the *Intercaste Marriage Rate* between upper and lower castes, which captures the thickness of social boundaries within each state. Intercaste marriage is defined here as a union between members of upper and lower caste groups. Castes are grouped into three categories; SC, OBC and general/others (including all the higher castes). The ascending order of class hierarchy is SC, OBC and Others but ST is excluded in this hierarchy. ST is often excluded as it reflects more of a community rather than a caste (Béteille 1986).

This indicator is constructed using data from the India Human Development Survey (IHDS), a representative household survey conducted in 2004–05. The dataset covers all major Indian states and includes 216,000 individuals. IHDS records each respondent's social group—SC, ST, OBC, and general/others. This dataset includes spouse-level linkage within households, enabling to identify inter-caste marriages.

I believe this proxy aligns with the construct my paper seeks to capture. First, it targets the social structure underpinning state politics, addressing the critique that SC/ST and religious shares fail to capture intra-state dynamics. Second, by conditioning on marriages that involve an upper-caste spouse, the indicator focuses precisely on the upper–lower boundary the reviewer identifies as pivotal.

Third, this measures varies meaningfully across large states yet is stable within states over short horizons, I use it as a contextual moderator rather than a time-varying regressor: it interacts with my cleavage measure to test whether organizational strain is systemically larger where the upper–lower boundary is thicker. Table 2 explains the national trend and state-level data, which is summarized below.

Then, I conduct additional tests to investigate whether the Intercaste Marriage Rate produces statistical effects. First, I substitute this measure for the previous variables and reestimate the models using the same technique. However, the results fail to achieve statistical significance across all paths. The coefficients themselves remain substantively weak as well. The details of this result is reported in table 3.

<Table 2: Intercaste Marriage Rate in 15 Indian States (2004-2005)>

State	Women marry men			Total Rate
	With same caste	of lower caste than hers	Of upper caste than hers	
India	90.1	5.1	4.8	9.9
Uttar Pradesh	91.4	5.0	3.6	8.6
Madhya Pradesh	96.5	1.9	1.7	3.5
Punjab	77.5	11.9	10.5	22.5
Rajasthan	97.7	21.4	0.9	2.3
Bihar	95.3	2.1	2.6	4.7
Orissa	86.1	7.5	6.4	13.9
West Bengal	90.5	5.9	3.7	9.5
Assam	83.2	9.3	7.4	16.8
Gujarat	86.3	6.3	7.4	13.7
Maharashtra	82.3	6.4	11.3	17.7
Andhra Pradesh	92.4	3.3	4.4	7.6
Karnataka	83.5	9.8	6.7	16.5
Kerala	78.7	14.6	6.7	21.3
Tamil Nadu	97.4	1.3	1.2	2.6
Haryana	82.7	11.0	6.3	17.3

<Source: Das, Kumudini, Kailash C. Das, Tapan Kumar Roy and Pradyumna Kumar Tripathy. 2010. "Dynamics of Inter-Religious and Inter-Caste Marriages in India." *Population Association of America*>

<Table 3: The Direct and Indirect Effects of *Intercaste Marrage Rates* to Regional Party Strength>

	Model 1	Model 2	Model 3 *(INC)*	Model 4 *(INC)*	Model 5	Model 6
DV: Regional Party Strength						
Organized Level of National Parties	-0.22 (0.13)	-0.31 (0.51)	-0.14 (0.39)	-0.20 (0.03)	-0.21 (0.21)	-0.19 (0.08)
Intercaste Rate	0.00 (0.01)	0.01 (0.01)	0.00 (0.32)	0.01 (0.33)	0.01 (0.57)	0.02 (0.45)
Constant	1.80*** (2.36)	2.12*** (3.31)	5.34*** (4.63)	4.38*** (3.16)	2.38 (3.76)	1.49 (4.45)
DV: Organized Level of National Parties						
Intercaste Rate	-0.14 (0.02)	-0.31 (0.12)	-0.22 (0.21)	-0.31 (0.11)	-0.18 (0.31)	-0.11 (0.03)
Constant	3.41*** (4.34)	33.12*** (5.55)	24.15 (3.64)	6.31* (4.26)	15.13 (5.32)	22.47* (7.61)
Observations	380	380	380	380	380	380
R square	0.33	0.32	0.43	0.44	0.40	0.42

Regarding the result, I interpret this as reflecting mixed considerations. My prior expectation was that higher rates of intercaste marriage would reduce the caste segmentation and may shift attention toward nationwide issues such as the economy or national security. This shift would make it easier for national parties to aggregate votes around common platforms. As intercaste marriage weakens the influence of caste brokers that outbid caste-based issues, regional fragmentation would diminish, thereby lowering the likelihood of regional party growth.

At the same time, I must also consider the possibility that, as caste boundaries lose salience with greater intercaste marriage, preferences may realign around regionally shared issues. In this scenario, local elites can more readily assemble coalitions under a unifying platform (e.g. state finances, infrastructure, or the protection of linguistic communities) and thereby found or expand regional parties. In practice, marriage networks may facilitate the formation of intraregional coalitions, enabling local elites to leverage broader relational ties that strengthen regional parties.

Then, I examine the interaction between my previous variables (ORI or RDI) and the Intercaste Marriage Rate (IMR). The rationale is that such interactions may amplify some effects of intercaste marriage on the growth of regional parties. They are very loosely correlated (ORI x IMR: 0.213 /RDI x IMR: 0.255) one another .

<Table 4: The Direct and Indirect Effects of *Interaction variables* to Regional Party Strength>

	Model 1	Model 2	Model 3 *(INC)*	Model 4 *(INC)*	Model 5	Model 6
DV: Regional Party Strength						
Organized Level of National Parties	-0.40* (0.13)	-0.41 (0.51)	-0.42*** (0.39)	-0.56*** (0.13)	-0.29 (0.41)	-0.29 (0.44)
Interaction terms	0.03 (0.11)	0.01 (0.21)	0.04* (0.01)	0.04* (0.03)	0.03 (0.27)	0.02 (0.15)
Constant	1.80*** (4.90)	2.12*** (13.11)	5.34*** (7.33)	4.38*** (9.10)	2.38 (12.06)	1.49 (14.21)
DV: Organized Level of National Parties						
Interaction terms	-0.32** (0.05)	-0.31*** (0.14)	-0.42*** (0.37)	-0.39*** (0.23)	-0.18** (0.33)	-0.10** (0.11)
Constant	6.42** (1.04)	33.12*** (6.42)	24.15 (13.04)	6.31* (11.55)	15.13 (24.12)	22.47* (9.78)
Observations	380	380	380	380	380	380
R square	0.41	0.42	0.54	0.55	0.40	0.44

The results are nuanced. Across all six models, the interaction terms are associated with a reduction in the organizational strength of national parties, significant at the 95% confidence level. However, no significant effects emerge along other paths, including the direct effects on the growth of regional parties. The explanatory power of this analysis does not differ meaningfully from that of my previous analysis.

This suggests that as caste-based social boundaries lose salience, local bosses are more likely to mobilize voter support around region-specific issues shared within the local population. This may amplify national–regional dissimilarity, which raises coordination costs between national and regional branches within a party.

This analysis necessitates narrowing my perspective to the relationship between the interaction terms and the organizational strength of national parties. However, given the methodological limitations of path analysis, these interaction effects need to be further decomposed. Then, I additionally estimate OLS models to further investigate how this interaction affects the organizational strength of national parties. Table 5 summarizes the result below.

<Table 5: Regression Table of the Factors affecting to Party Organization>

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Cleavages (RDI)	-0.026*** (0.001)	-0.036*** (0.015)	-0.025** (0.001)	-0.038*** (0.022)	-0.027 (1.368)	-0.055 (1.445)
Cleavages (ORI)	-0.016** (0.030)	-0.043** (0.010)	-0.258*** (0.030)	-0.134** (0.025)	-0.011** (0.112)	-0.013 (0.133)
Interaction (RDI)	-0.032*** (0.016)	-0.091*** (0.001)	-0.105*** (0.001)	-0.0154** (0.016)	-0.012* (0.142)	-0.061* (0.222)
Interaction (ORI)	-0.034* (0.134)	-0.066** (0.032)	-0.082* (0.234)	-0.070* (0.119)	-0.100* (0.204)	-0.092 (0.114)
Intercaste marriage	-0.060 (0.084)	-0.055 (0.076)	-0.060* (0.084)	-0.074 (0.071)	0.021* (0.422)	0.060 (0.226)
ENP	-0.039* (0.022)	-0.044** (0.022)	-0.038 (0.022)	-0.114 (0.043)	0.024* (0.142)	0.061 (0.122)
Fiscal Spending	0.021* (0.426)	0.027* (0.426)	0.026 (0.422)	0.325 (0.423)	0.018 (0.002)	0.011 (0.022)
Post-1993	-0.014*** (0.028)	-0.011*** (0.028)	-0.011** (0.027)	-0.016*** (0.028)	0.322 (1.363)	0.256 (1.440)
Electoral Volatility	0.325 (1.408)	0.328 (1.368)	0.255 (1.445)	0.244 (1.322)	0.018 (0.113)	0.017 (0.136)
Turnout	0.024* (0.080)	0.011** (0.112)	0.013 (0.133)	0.011* (0.012)	0.091* (0.022)	0.044** (0.012)
Vote Margin	0.100 (0.011)	0.104 (0.039)	0.136 (0.032)	0.140 (0.061)	0.111 (0.018)	0.145 (0.171)
Constant	15.90*** (4.545)	29.32*** (4.333)	11.39*** (5.124)	13.45*** (4.340)	23.71*** (4.335)	29.11*** (5.366)
Observations	380	380	380	380	380	380
R square	0.42	0.44	0.50	0.51	0.38	0.38

The findings are threefold. First, national-regional dissimilarity remains statistically significant. Second, intercaste marriage is positively associated with a dependent variable, but not statistically significant. Third, the interaction terms are significant but do not improve explanatory power beyond vertical dissimilarity. However, these findings are not statistically significant when party organization is measured using national parties excluding the INC (models 5 and 6). And this findings are robust when vertcial dissimilarity is measured by RDI, instead of ORI.

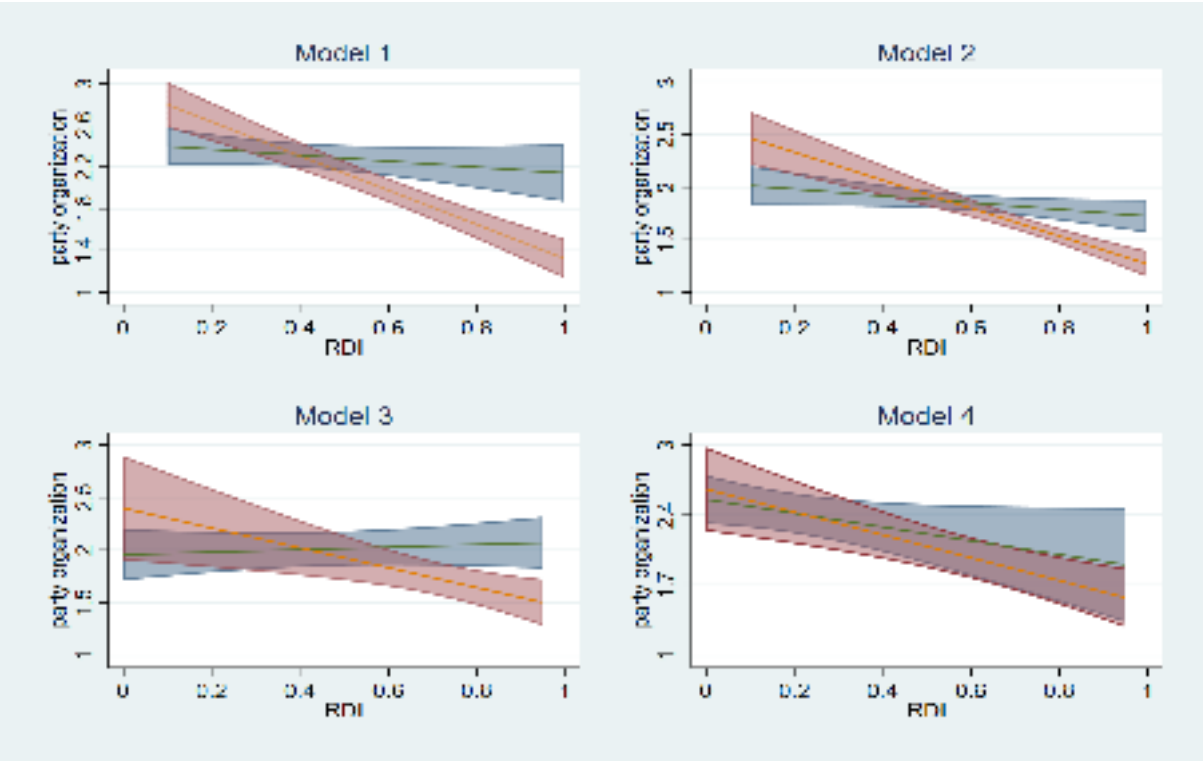
I interpret that the effect of intercaste marriage on the organizational strength of national parties is conditional on the level of vertical dissimilarity. As vertical dissimilarity increases, the impact of intercaste marriage strengthens, which further weakens the organized level of national parties. However, when vertical dissimilarity is zero, the intercaste-marriage effect disappears. By contrast, the effect of vertical dissimilarity remains significant irrespective of intercaste marriage.

Taken together, my results suggest that intercaste marriage operates not as an independent driver but as a moderator that amplifies organizational costs. By eroding caste boundaries, intercaste marriage facilitates region-wide coordination around distributive claims. On the other hand, when national–regional dissimilarity is minimal, its effect on party organization is negligible, yielding a null effect.

Figure 2 reiterates this logic. When vertical dissimilarity is measured by RDI, the interaction with intercaste marriage increasingly erodes party organization as RDI rises. By contrast, when vertical dissimilarity is weak at baseline, the difference between higher- and lower–intercaste-marriage groups is effectively null. Using the sample median intercaste-marriage rate (13.2%) as a cutoff, I classify observations into higher and lower groups.

However, Model 4 shows no difference between the two groups across all ranges; I therefore reject the marginal effect of the RDI × intercaste-marriage interaction on the organizational strength of the INC.

<Figure 2: Marginal Predictions of Intercaste Marriage
Across Vertical Dissimilartiy (RDI)>



<Endnote: *Red Plot: higher intercaste marriage rate /
Blue Plot: lower intercaste marriage rate*>

In conclusion, I maintain that vertical dissimilarity is the primary driver. Because these tests do not fundamentally alter the theoretical framework, I report them together with the regression tables in the online appendix. I have also removed the

earlier OLS analysis that identifies factors facilitating regional party strength. As the reviewer previously noted, that exercise offers limited insight into the core argument; I thus replace it with the analysis above, which is better specified and more closely aligned with the theory.