An Inquiry into the Ripple Effect of Coups d'État

The concepts of fractionalization and "cross-cuttingness"[1] found most frequently in the

conflict studies literature seek to operationalize the diversity that can be found across the many

cultures of the world, such that its impact can be quantified. Of great interest is to what extent

various cultural cleavages — of which ethnicity, language, and religion generally receive the

greatest focus — impede or enhance the transfer of information from one polity to another.

The types of information transfers that could be analyzed are myriad — domestic unrest, types

of torture used or prohibited, the signing of treaties and alliances — but one area that begs

further exploration is that of military takeovers of government, or coups d'état. It has been

argued that coups taking place in one state have a spillover or contagion effect, thus making

the likelihood of a coup in a nearby country more likely.[2] As Egil Fossum wrote, "Finally we have

shown that coups in many instances were not without consequences for other countries, in

that they contributed to triggering off coups in neighboring countries."[3] However, the quality of

the evidence used to support this trend has proved to be less than satisfactory.[4] In order to be

able to determine the potential effects of culture, one must establish a baseline relationship

between coup events and their coup-triggering effects on neighboring states. If in fact a

relationship can be found, the discovery of a link between culture and the transmission of

information will be that much more powerful. In the pursuit of this greater inquiry, one must

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[1] Selway, Joel Sawat. "The Measurement of Cross-Cutting Cleavages and Other Multidimensional Cleavage Structures." *Political Analysis* 19, no. 1 (2011): 48–65.
[2] Pitcher, Brian L., Robert L. Hamblin, and Jerry L. L. Miller. "The Diffusion of Collective Violence." *American Sociological Review* 43, no. 1 (February 1978): 23.
[3] Fossum, Egil. "Factors Influencing the Occurrence of Military Coups D'Etat in Latin America." *Journal of Peace Research* 4, no. 3 (September 1967): 228–51.
[4] Belkin, Aaron, and Evan Schofer. "Toward a Structural Understanding of Coup Risk." *Journal of Conflict Resolution* 47, no. 5 (October 2003): 594–620.

ask a question comprised of two parts: (1) is a state more likely to experience a coup if a nearby state recently experienced a coup; and (2) does a similar cultural demographic have an enhancing effect on this likelihood? This paper seeks to answer the first part of this question, via a logistic time-series analysis of Argentina and Bolivia from 1950 to 1995. As states that have been plagued by hostile military takeovers of their governments, these two states provide more coup events for study compared to any other polities in the world.

Review of the Literature

Coups and their associated risks are important insofar as they relate to human rights because of the higher degree of human rights abuses that take place under the resulting non-democratic-regimes. After decades of study, the literature addressing the causes of coups is vast. This has allowed for a wide variety of contributing factors to be tested and analyzed in the quest to create an ever more predictive model. On the other hand, so many studies have been done that it becomes difficult to sort out what are the most significant factors. One of the first and most logical causes identified was military officers' personal grievances against the ruling group.[5] While likely a factor in almost every case, the highly individualistic nature of personal grievances makes it also likely that there is always a certain segment of military officers that look unkindly upon the current regime at any particular time. Similarly, the concept of military organizational grievances suffers from statistical difficulties related to measurement and identification, as all militaries have grievances on one level or another. Other attributes of the

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[5] Thompson, William R. "Corporate Coup-Maker Grievances And Types Of Regime Targets." *Comparative Political Studies* 12, no. 4 (January 1980): 485–96.

military, like its national security doctrine[6], officer political culture, and level of professionalism,[7] have been found to play a role in the likelihood of a coup but suffer from issues of classification, measurement, and a lack of data for large-N studies.[8]

In his 1967 analysis of factors contributing to coups in Latin America, Egil Possum showed that "some socio-economic characteristics of countries seem particularly conducive to the occurrence of military coups, notably size and poverty."[9] Possum first theorized that larger nations possessed more regional rivalries, creating conflicting interest groups that may choose to overthrow the government in order to secure their dominance. Second, Possum argued that based on the empirical evidence, poverty contributes to coups by making the vast majority of the population unable to challenge the elite. As a result, one is left with a "big-poor nation" where local elites exercise a disproportionate amount of control in the governance of the state, up to and including that ability to pursue extrajudicial takeovers. Additionally, Possum "demonstrated that the coups often concentrated around election times and in periods with a deteriorating economy." Other authors, including S.E. Finer,[10] D. A. Hibbs,[11] and E. Luttwak,[12] defined "domestic political crisis" as another related cause of coups d'état, the theory being that as increased uncertainty breeds increased discomfort, the military will act to bring a

[6] Stepan, Alfred C. *The Military in Politics: Changing Patterns in Brazil*. Princeton Legacy Library, Book 1795. Princeton University Press, 2015.

[7] Huntington, Samuel P. *The Soldier and the State: The Theory and Politics of Civil-Military Relations*. 19. print. Cambridge, Mass: Belknap Press, 2002.

[8] Belkin, Aaron, and Evan Schofer. "Toward a Structural Understanding of Coup Risk." *Journal of Conflict Resolution* 47, no. 5 (October 2003): 594–620.

[9] Fossum, Egil. "Factors Influencing the Occurrence of Military Coups D'Etat in Latin America." *Journal of Peace Research* 4, no. 3 (September 1967): 228–51.

[10] Finer, S. E., and Jay Stanley. *The Man on Horseback: The Role of the Military in Politics*. New Brunswick, N.J: Transaction, 2002.

[11] Hibbs, Douglas A. *Mass Political Violence: A Cross-National Causal Analysis*. New York, NY: John Wiley & Sons, 1973.

[12] Luttwak, Edward. *Coup D'état: A Practical Handbook*. Revised edition. Cambridge, Massachusetts: Harvard University Press, 2016.

semblance of order back to the nation and head off the opportunity for a government hostile or unfavorable to the military to form.

In 2003, Arron Berlin and Evan Schofer carried out a robust survey of the causes of coups that had been proffered over the years. Of the 21 causes identified, they found five amenable to large-N analyses, supported by high quality statistical evidence, and linked by a compelling theoretical mechanism to coups: participation in war/military defeat; economic development/wealth; the strength of civil society; regime legitimacy; and past coups in the same country.[13] Subsequent analyses revealed that the size of the military played a significant role in affecting the likelihood of a coup after one had taken place. Since Belkin and Schofer focused exclusively on the structural or "background" causes of coups, they chose to exclude several immediate or "triggering" causes of coups in their analysis (like a recent military defeat). As this inquiry has no such limitation, the independent variables under consideration include controls for several causes found to be significant in the literature as well as other exploratory and "triggering" variables.

Theory, Hypotheses, and Methodology

A challenge faced by all studies of coups d'état is the infrequency of the phenomena. In order to compensate, many statistical explorations have been forced to look globally, pooling all coups d'état events together. Unfortunately, such an approach here would be impractical. In order to gain any insight regarding the transfer of information between states (in this case, via coups d'état), each state would need to be matched with every other state over some period of

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[13] Belkin, Aaron, and Evan Schofer. "Toward a Structural Understanding of Coup Risk." *Journal of Conflict Resolution* 47, no. 5 (October 2003): 594–620.

time. For example, looking 200 states over a period of 40 years would result in more than 800,000 country-pair-years (e.g. France-Germany 1960), most of which would yield little to no useful information (i.e. it is unlikely that the Angolan coup d'état of 1974 contributed to coups d'état in Asia or South America the next year). Furthermore, the literature suggests there is a cumulative effect coups d'état have on the likelihood of subsequent coups d'état. As a result, the model should account for the effects of a coup d'état over time within the state as well.

For these reasons, Argentina and Bolivia in the period from 1950 to 1995 were selected for analysis as 1) both states experienced numerous coup d'état during this time; 2) both states occupy the same world region to allow for the theorized coup d'état spillover effects; and 3) the cultural attributes they share (e.g. colonial history) help to minimize the statistical noise caused by variables not included in the proposed model. As the dependent variable, whether at least one coup d'état took place in a given year, is binomial, this analysis is carried out using time-series logistic regression. One of the benefits of using this particular type of regression analysis is that it allows for a probabilistic investigation into what factors are most useful in predicting the occurrence of coups d'état. This paper argues that the likelihood that a coup d'état will occur is related to several factors, and that the effects of these factors are sensitive to the passage of time. For the sake of brevity, these variables can be summarized in two general categories: those that increase the likelihood of a coup d'état (a recent domestic coup [RC], a coup taking place in a bordering country [BC], a successful border coup [BCS], military expenditures [ME], and the number of military personnel [MP]), and those that decrease the likelihood of a coup d'état (an unsuccessful border coup [BCU], real GDP per capita [rGDP],

growth rate of real GDP per capita (lagged one year)[GR], political contestation [Con], and

political inclusiveness [Inc]).

Analysis of Findings

Preliminary analysis of the tolerance values (i.e. the degree to which a variable captures

unique information not already accounted for by other variables) for each independent variable

showed that two pairs, political contestation/inclusiveness and military expenditures/number

of personnel, experienced a significant degree of overlap. Therefore, these variables were

combined (Strength of Polyarchy [SP] and Overall Military Capability [OMC], respectively),

reducing the number of independent variables from ten to eight. In the interest of parsimony,

the variables "border coup (unsuccessful)" and "real GDP per capita" were dropped from the

final model due to a lack of statistical significance (p>0.9), a lack of substantively significant

effects (absolute value of β < 0.0001) in the case of "real GDP per capita," and extreme

multicollinearity in the case of "border coup (unsuccessful)" (VIF $\approx \infty$). This resulted in six

independent variables for this statistical model, written algebraically as follows:

$$H_{final} : \log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_{RC}X_{RC} + \beta_{BC}X_{BC} + \beta_{BCS}X_{BCS} - \beta_{GR}X_{GR} - \beta_{SP}X_{SP} + \beta_{OMC}X_{OMC} + \varepsilon$$

The Durbin-Watson statistic reveals the amount of serial correlation, also called

autocorrelation, between error terms over time. Serial correlation can result in an

underestimate of the standard error in a statistical model, which then can cause variables to

appear to be statistically significant when they are in fact not. Analysis of the Durbin-Watson

statistic in this model allows us to accept the null hypothesis that no positive serial correlation

exists in the Argentina case. However, in the case of Bolivia the test is inconclusive. Attempts to

correct for potential serial correlation of the error term include lagging variables, reintroducing

previously excluded variables, and removing statistically insignificant variables. None of these

attempts were successful in affecting the Durbin-Watson statistic for Bolivia; in fact, the

statistic showed remarkable stability regardless of whichever attempt at correcting for serial

correlation was applied. A deeper exploration of the Bolivian case can be found later in this

section.

Table 1: Logistic Analysis of Argentina from 1950-1995					
-2 Log likelihood: 39.183			Cox & Snell R Square: 0.288		
Variable Name	Beta Value	Significance (p)	Exp(B)	Odds Ratio	Probability
Recent Coup [RC]	0.186	0.900	1.204	3.33	76.92%
Border Coup [BC]	-2.537	0.078*	0.079	1.08	51.97%
Border Coup (Successful) [BCS]	3.248	0.040**	25.751	$> 1.5 \times 10^{11}$	~100%
Growth Rate of Real GDP per capita [rGDP]	-0.184	0.050**	0.832	2.30	69.68%
Strength of Polyarchy [SP]	-0.738	0.029**	0.478	1.61	61.73%
Overall Military Capability [OMC]	-0.795	0.066*	0.452	1.57	61.11%
Constant	-2.257	0.008**	0.099		

Notes: * = $p < 0.1$; ** = $p < 0.05$; all odds ratios should be understood as the listed value:1

Table 1 shows the results of the time series logistic regression for Argentina from the

years 1950 to 1995. The model was able to correctly predict whether a coup d'état event would

take place or not for 76.1% of the years analyzed, with the same total number of coups d'état

predicted as was observed, but at different times. The log likelihood and Cox & Snell R Square

values are other descriptions of the fit of the model when compared to the data. Unfortunately,

both are best used to compare the fit of the same model with different specifications, making both somewhat difficult to interpret independent of comparable studies. This is further exacerbated by the fact that the Cox & Snell R Squared measure has an upper bound of less than 1, which varies with the marginal proportion of cases with events. Thus, these statistics have been provided in the spirit of transparency and replicability but are of limited utility.

The far more interesting results can be found within the lower sections of the Table 1. First, "recent coup" has the expected sign (+) suggesting that previous coups d'état do indeed encourage subsequent coups d'état. However, this variable has an almost shockingly low level of significance, suggesting that at least in the case of Argentina it makes for a poor predictor, even after controlling for the effects of other variables. All other variables achieve statistical significance at or near the traditional 5% cutoff level, and therefore warrant further discussion.

The variable "border coup" shows an unexpected sign (-) suggesting that coups d'état in bordering countries actually decrease the likelihood of a coup d'état in Argentina. While the magnitude of the B value is high, this does not translate into an impressive effect on the odds; as can be seen in the table, a coup d'état in a bordering state gives 1.08:1 odds (or roughly a 52% chance) of a coup d'état not occurring in Argentina, amounting to little more than a coin flip. The negative sign and unimpressive predictive power of this variable is likely due to the fact that the "border coup" variable includes both successful and unsuccessful coups d'état, especially when compared to the next predictor variable.

"Border coup (successful)," highlighted in green, not only is statistically significant and shows the expected sign (+), but also provides near certain predictive power. Based on the Exp(B) value, if a state bordering Argentina experiences a successful coup d'état event, there

are better than 150,000,000,000 to 1 odds (virtually a 100% chance) that Argentina will experience a coup d'état in the next year. This somewhat surprising result is by far the most impressive of all the predictor variables tested.

Both "growth rate of real GDP per capita" and "strength of polyarchy" show the expected signs (-) supporting the hypotheses that they have a negative relationship with the likelihood of a coup d'état event taking place. Thus, higher real GDP growth rates and stronger democratic elements of society lower the likelihood of a coup d'état, with odds of 2.30 to 1 (~70%) and 1.61 to 1 (~62%) of a coup d'état not occurring, respectively.

While statistically significant as a predictor, "overall military capacity" shows an unexpected sign (-), suggesting that greater military expenditures and more personnel decrease the likelihood of a coup d'état event. This may be because of a lack of nuance in the measure. Higher levels of military expenditure may denote a stronger economy overall, while greater numbers of military personnel may also denote a more established military structure. Both of these elements may in fact be more descriptive of established governmental norms, rather than the military itself. Repeated studies of this phenomenon may enjoy more success by focusing instead on the proportion of government spending that goes to the military and military personnel per capita as better measures of the strength of the military relative to the state under investigation.

Table 2: Logistic Analysis of Bolivia from 1950-1995					
-2 Log likelihood: 49.566			Cox & Snell R Square: 0.213		
Variable Name	Beta Value	Significance (p)	Exp(B)	Odds Ratio	Probability
Recent Coup [RC]	0.503	0.721	1.653	5.22	83.93%
Border Coup [BC]	0.552	0.702	1.737	5.68	85.03%

Border Coup (Successful) [BCS]	0.425	0.763	1.529	4.61	82.19%
Growth Rate of Real GDP per capita [rGDP]	-0.092	0.302	0.913	2.49	71.36%
Strength of Polyarchy [SP]	-0.415	0.052*	0.660	1.93	65.93%
Overall Military Capability [OMC]	-0.370	0.158	0.690	1.99	66.60%
Constant	-1.649	0.033**	0.192		

Notes: * = $p < 0.1$; ** = $p < 0.05$; all odds ratios should be understood as the listed value:1

Table 2 shows the results of the time series logistic regression for Bolivia from the years 1950 to 1995. The model was able to correctly predict whether a coup d'état event would take place or not for 67.4% of the years analyzed, with the same total number of coups d'état predicted as was observed, but at different times.

All three "coup" variables show the expected sign in the Bolivian case (+), suggesting that coups d'état in Bolivia or in bordering countries (successful or not) promote subsequent domestic coups d'état. Furthermore, all three variables do so at approximately 5 to 1 odds, or with an ~83% chance of a coup d'état event taking place. However, none of the three "coup" variables achieved statistical significance, making them poor predictors overall of coups d'état in Bolivia.

The variable "overall military capacity" again possesses an unexpected sign (-), most likely for the same aforementioned reasons, with nearly 2 to 1 odds (~66%) that a coup d'état will not occur for every one unit increase in the predictor variable. However unlike in Argentina, this variable does not come close to reaching statistical significance, making predictions based off this variable untrustworthy at best.

As in the case of Argentina, "growth rate of real GDP per capita" and "strength of polyarchy" show the expected signs (-) supporting the hypotheses that they have a negative relationship with the likelihood of a coup d'état event taking place. Thus, higher real GDP growth rates and stronger democratic elements of society lower the likelihood of a coup d'état, with odds of 2.49 to 1 (~71%) and 1.93 to 1 (~66%) of a coup d'état not occurring respectively. However, unlike in Argentina, "growth rate of real GDP per capita" failed to achieve statistical significance, making it a worthwhile predictor in the Argentinean but not the Bolivian case. In fact, "strength of polyarchy" is the only variable that achieves statistical significance at or near the 5% cutoff.

When attempting to discover reasons for why this is so, one must reflect back on the indeterminate results of the Durbin-Watson statistic. Potential serial correlation between the error terms from one year to another could result in poor estimations of significance. Serial correlation can be caused by dramatic shocks to the system, which ripple along the timeline in the form of inflated or deflated error. Interestingly the primary subject of this study, coups d'état, is one such example of a "shock" making it difficult to point to any one event as severe enough to cause serial correlation of the error terms. Instead, the problem may be that that this study begins in the middle of a tumultuous period in Bolivia. From 1932-1935, Bolivia fought an inconclusive war with Paraguay that left more than 100,000 dead. In 1941, the leftist Movimiento Nacionalista Revolucionario (MNR) was formed, serving as the primary opposition force to the government and participating in a series of violent coups d'état and counter-revolutions from the 40s onwards.[14] This missing data could in fact be contributing to the lack

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[14] Gascoigne, Bamber. "HistoryWorld." History of Bolivia. *HistoryWorld* (blog).

of significance across the board for the model. A refinement of this study would be wise to widen the range of years analyzed, assuming data could also be found for the predictor variables over the same time period (which was the main limitation in compiling the dataset).

Another possibility is that Bolivia simply differs markedly from Argentina, in ways not captured by the current model. While these two states make excellent cases for analysis due to their high number of coup d'état events, shared border, and legacy of colonialism, they still possess marked differences. Demographically, Bolivia has the largest indigenous population of all of South America; so much so that indigenous people constitute the majority of the state, whereas Argentina is far more European both ethnically and culturally.[15] This divide is evidenced further by the high levels of poverty and low levels of education for much of the indigenous population in Bolivia, particularly during the earlier segment of the timeframe investigated.[16] This may also help to explain why the "strength of polyarchy" variable was found to be significant, where other predictors were not. During the first two decades of the 20th century, the electorate doubled in size (a dramatic change to say the least), but only from 2.5% to 5% of the population.[17] Any expansion in the size of the electorate (captured by the inclusiveness measure, which is then folded into the "strength of polyarchy" predictor variable) would be relatively significant. If this is indeed the case, correcting the timeline should cause the "strength of polyarchy" to become an increasingly powerful predictor.

Conclusions

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[15] "Bolivia." *The World Factbook*. Central Intelligence Agency, May 25, 2018.

[16] Osborne, Harold. *Bolivia, a Land Divided*. Westport, Conn: Greenwood Press, 1985.
[17] Gascoigne, Bamber. "HistoryWorld." History of Bolivia. *HistoryWorld* (blog).

This study provides tentative evidence for the hypothesis that coups d'état in one state can contribute to coups d'état in other states nearby. However, the results also raise the specter of whether such a generalization can be made for all states. In the case of Argentina, there is great support; however, the Bolivian case raises far more questions than it resolves. The comparatively poorer fit for the model also suggests that a better theoretical framework should be created for Bolivia before hard and fast conclusions can be drawn, but this paper will attempt to elucidate one overarching concept that can guide future investigations.

Based on the results of the Argentinian and Bolivian cases, it appears that states that have experienced a coup d'état can be divided into two groups, hereafter referred to as "seeder" states and "feeder" states. Seeder states can be defined as ones in which coups d'état are caused by intrinsic or domestic factors. Economic destabilization, a dramatic military defeat, weak institutional norms, or a military apparatus unwilling to cede control to the civilian population are all potential contributing factors in a seeder state. Once the coup d'état occurs, a seeder state has a rippling effect on those states unlucky enough to share a border - so called feeder states. Seeder states can then be understood as a type of "patient zero" in regards to the contagion effect of coups d'état, whereas feeder states are ones in which coups d'état are triggered by the destabilization effect of a neighbor's successful coup d'état – i.e. the coup has been "fed" due to the perpetrators' enhanced estimation of success. If this is true, the prevention of coups d'état becomes all the more important, due to the magnifying, rippling impact an otherwise relatively powerless state may have on more influential neighbors.

Of course, more case-by-case analyses would need to be undertaken to fully support such a theory. But even taken as is the results of this study answer, at least in part, one of the

questions asked at the outset; namely (1) is a state more likely to experience a coup if a nearby

state recently experienced a coup? The answer is yes, at least in some cases. Therefore, there

appear to be grounds for further inquiry into the latter question: (2) does a similar cultural

demographic have an enhancing effect on this likelihood? A refinement of this study, followed

by the pursuit of the second question, should provide a rich program for future research.