Appendix

Measuring Revolts in South America

Various attempts have been made to count revolts in South America during the 19th century, but none of them provide a comprehensive list of revolts in the region. Indeed, the sheer number of revolts has led some scholars to despair of the possibility of counting them all (Centeno 2002, 61; Loveman 1999, 43). Some historians have provided exhaustive accounts of revolts in individual countries (Álvarez 1987; Aranzaes 1918; Arboleda 1907; Arráiz 1991; Bento and Giorgis 2016; Camogli 2009; Pardo Rueda 2004), but the different definitions used in these works make cross-country comparisons infeasible. Others like Coatsworth (1998) supply valuable surveys of specific subsets of revolts (e.g., popular rebellions in rural areas) but exclude most revolt types. Scheina (2003) provides the most comprehensive study of revolts during this period, but even he omits some major rebellions and fails to provide selection criteria and a clear definition of the phenomena he examines.

Social scientists have developed various conflict databases that set out clear definitions and selection criteria, but they typically do not cover domestic conflict in the 19th century. The Correlates of War (CoW) data set is an important exception, but it only includes intra-state conflicts that generated more than 1,000 battle deaths, excluding numerous insurgencies that involved thousands of participants and had significant effects such as the secession of a territory or the overthrow of a president (Sarkees and Wayman 2010). To be sure, it is essential to set some minimum size requirement for inclusion in a database of civil wars, but 1,000 battle deaths is an excessively high threshold for revolts, particularly for nineteenth-century Latin America where populations were small, and the instruments of warfare were still relatively primitive. For a country like Uruguay 1,000 men represented 1.3 per cent of the population in 1830. Simply arming 1,000 men represented an impressive degree of mobilization, equivalent to the proportion of the French

population in the Grande Armée in 1812. Thus, using that threshold, a country like Uruguay is virtually excluded from the possibility of experiencing a civil war—even when our dataset registers nine outsider revolts in Uruguay that historians refer to as civil wars. CoW also excludes some rebellions that reach the 1,000-deaths threshold according to our sources (See also Gleditsch 2004) in part because it does not appear to have used the most comprehensive Spanish- and Portuguese-language sources available on these conflicts to determine reliable estimates.[1] As a result, whereas CoW only counts 37 civil wars in South America between 1830 and 1929, we identify 60 South American revolts that produced more than 1,000 battle deaths, 253 revolts that involved at least 500 rebels, and 499 revolts in total. Our database thus presents a fuller picture of political violence in South America.

When CoW scholars noted that a 1,000-battle-deaths threshold for wars led to a lot of missing information about militarized inter-state interaction, they came up with the concept of a militarized interstate dispute (or MID) to capture all episodes of threat or use of force short of war (Palmer et al. 2022). In the civil war literature lower thresholds (of 25 battle deaths) are sometimes used to address this concern, but the datasets that use this do not reach beyond 1946 (Gleditsch et al 2002). Our dataset adopts a logic similar to that of MIDs but at the domestic level and we do not require any battle-death threshold. We define a revolt as a militarized intra-state dispute or *an instance of the use or the credible threat of violence by an identifiable domestic political group that defies the authority of the state*.[2] We record a credible threat of violence when militarization occurs—that is, when the rebel group takes up arms.

[1] In their short discussion of the Latin American revolts of the 19th century, Sarkees and Wayman (2010, Ch. 5) cite only English-language sources.

[2] This definition excludes common banditry or criminal activity that does not involve political goals; it also excludes efforts by the legislature to remove the president through impeachment or other measures when those moves do not involve force or the threat of force. Self-coups or repression directed by the ruler do not count as revolts, except when those actions prompt a

To identify and code revolts in South America between 1830 and 1929, we reviewed more than 250 historical works. The sources consulted included general histories and compendia of revolts as well as studies focusing on specific revolts.[3] We coded numerous revolt characteristics including: the type of rebellion; the duration and location of the revolt; the identity, leadership, and aims of the rebels; the number of participants and casualties; and the outcome of each revolt.

Any effort to identify and code revolts during this period is fraught with pitfalls. Perhaps, the most serious problem is the absence of data on some revolts, particularly smaller ones. Indeed, some smaller revolts may have been overlooked altogether because they are not covered in the sources that we consulted. Moreover, the missing data is presumably non-random since it is harder to obtain data on certain types of revolts, time periods, or geographic areas. In addition, biases may stem from the sources themselves: for example, some of the sources may have incentives to exaggerate or understate the size of revolts or the number of casualties.

We attempted to minimize the impact of these problems in several ways. First, we opted to focus on major revolts in our analyses, which we define as those in which at least 500 people rebelled. These revolts warrant emphasis because they had the potential to wreak substantial political and economic havoc. Equally important, data on them is more plentiful, which reduces measurement and identification error. Although it is difficult to know what percentage of all revolts we have identified, we feel confident that we have identified the vast majority of major revolts. Second, we consulted multiple sources for each revolt, which enabled us to gather more data and triangulate among various sources. We also used numerous Spanish- and Portuguese-language sources, which was particularly important given that the most comprehensive studies of revolts in

coordinated, violent response. Nor do international conflicts count as revolts unless they cause an internal rebellion in one of the participating countries.

[3] We identified sources based on bibliographic searches but also by seeking out the references in the initial sources consulted.

each country have typically not been published in English. Third, we depended most heavily on those sources that we deemed to be most reliable—these included studies by well-regarded historians and works that provide extensive details. Fourth and finally, we used consistent and transparent methods to code the variables, which are detailed in the codebook (in the appendix). To facilitate replication, in the database we also listed the sources used to code each revolt.

Alternative Model Specifications

In this section we provide further discussion of alternative model specifications and robustness checks. Our aim is to better explain our decision to use Poisson models, to ease concerns about multicollinearity among our military strength variables, and to further explore causal pathways discussed in the main text.

To check the suitability of specific count models to our data, we checked the robustness of our results to different assumptions that could apply to the distribution of unobservables and the error terms in our panel. The variance of our outcome variable (.30) is slightly below its mean (.32), with a dispersion parameter that is not statistically different from zero. A likelihood-ratio test comparing a negative binomial model to the Poisson model suggested that the latter model is more appropriate. Because our zeroes are true zeroes and extend to more than two thirds of the country-years under analysis, we also tested for the appropriateness of zero-inflated models (using the presence of any major revolt as the inflation factor), but both the Akaike's Information Criteria (AIC) and Bayesian Information Criteria (BIC) are not significantly lower than those of a standard Poisson model. Importantly, the results reported below not only hold in all these specifications, but they are strengthened in substantive and statistical significance. We therefore conclude that a Poisson regression is both the best available specification given the structure of our count data, and the most conservative in terms of the results, providing a sort of lower-bound estimate.

Convinced of the suitability of Poisson models, we focused on the robustness of the results and sensitivity to specific variables. After checking that variance inflation factors for all three main independent variables in our models remained under a value of 2, we adopted different model specifications to address concerns about multicollinearity and reverse causality. Table 1 shows how the results of Model 2 change when we drop individual variables measuring military strength and when we drop all of them at once. Two main conclusions can be derived from these models. First, the statistical and substantive significance of each indicator of military strength does not change importantly when others are excluded, which alleviates concerns about multicollinearity and demonstrates that each variable captures a theoretically relevant aspect of military strength. Second, the statistical and substantive significance of other indicators only increases when the three military strength variables are excluded (in Model 4), indicating that they have precedence in the causal pathway. The most prominent example is total exports, which more than duplicates its substantive impact and becomes significant (at $p<.05$) when all military strength variables are excluded. This suggests the effect of total exports on the number of outsider revolts is mediated by military strength variables. This hypothesis is confirmed when we run bivariate panel regressions on each of the military variables as outcomes and exports as a predictor: total exports—both concurrent and lagged—predict military outcomes consistently.

Finally, we address some remaining concerns about the coverage of the outcome variable in Figures 1 and Figure 2 below. Besides illustrating the good coverage of positive values for this count variable—see the discussion in the text—these figures show the specific years in which revolts take place. In line with our expectations, the figures show a dramatic decrease in outsider, but not insider revolts, in all countries other than Ecuador and Paraguay, during the first three decades of the 20th century.

Table 1. Varying Specifications of Model 2

	Model 2a	Model 2b	Model 2c	Model 2d
Military personnel (in 10,000)		-0.331**	-0.453***	
		(0.141)	(0.17)	
Number of military academies	-0.554**		-0.397*	
	(0.27)		(0.18)	
Military appointments by skills and merit	-0.364***	-0.363**		
	(0.13)	(0.15)		
Urbanization rate	-0.273	-0.096	-0.062	-0.140
	(0.59)	(0.56)	(0.48)	(0.37)
V-Dem electoral democracy index	-0.449	-0.287	0.012	-0.045
	(0.41)	(0.45)	(0.43)	(0.44)
V-Dem electoral democracy index^2	0.111	0.047	0.030	0.049
	(0.10)	(0.11)	(0.10)	(0.10)
Militarized interstate Disputes	0.122	0.161	0.116	0.087
	(0.17)	(0.17)	(0.17)	(0.18)
Defeat in international war (15-year period)	0.107	-0.020	0.067	0.196
	(0.29)	(0.26)	(0.27)	(0.33)
Total exports	-0.601	-0.478	-0.444	-1.082**
	(0.42)	(0.40)	(0.39)	(0.23)
Hundreds of miles of telegraph lines	0.207	0.047	0.016	0.184
	(0.20)	(0.19)	(0.17)	(0.23)
Hundreds of miles of railway track	-0.011	-0.036	-0.043	-0.152
	(0.13)	(0.13)	(0.12)	(0.15)
Population (log)	-0.004	-0.031	0.039	0.036
	(0.10)	(0.11)	(0.07)	(0.06)
Constant	-3.112	-4.059	-20.622	2.692
	(7.29)	(13.99)	(6.96)	(3.19)
Pseudo r-squared	0.2164	0.2207	0.2271	0.1845
Fixed effects	Two-way	Two-way	Two-way	Two-way
Standard errors	Clustered	Clustered	Clustered	Clustered
N of observations	793	775	788	892

Standard errors in parentheses. Country and year dummies not shown.
*p<.10; **p<.05; ***p<.01

Figure 1. Number of major outsider revolts (active) per country-year

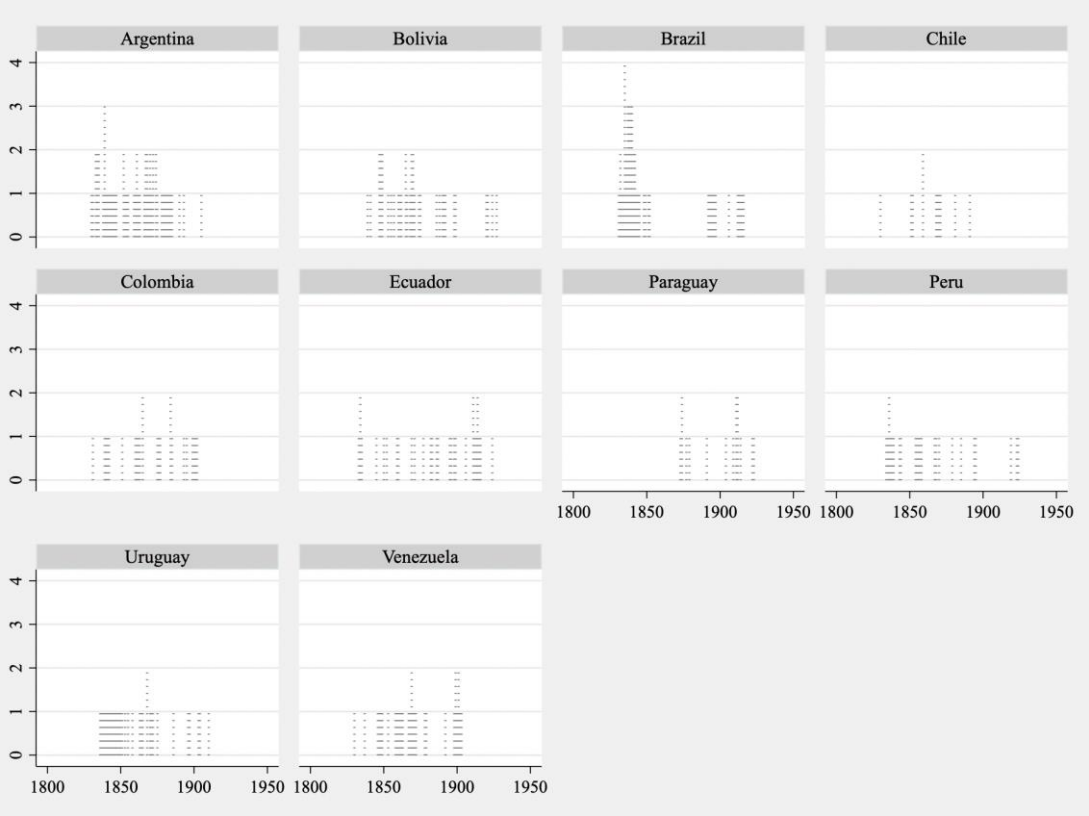
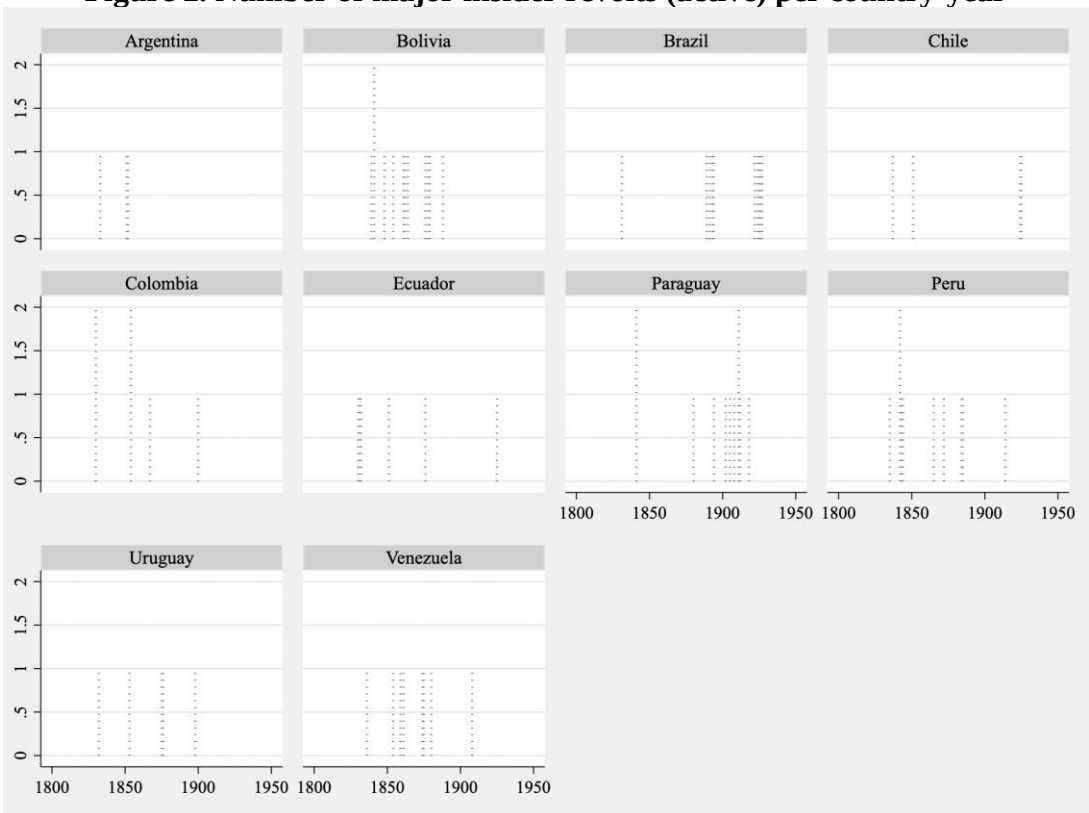


Figure 2. Number of major insider revolts (active) per country-year



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