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**Abstract**

We revisit the simultaneous equations model of rebellion, mobilization, grievances and repression proposed by Gurr and Moore (1997). Our main contribution is to clarify and improve on the underlying identification strategy by resorting to the well-known colonization instruments recently constructed by Acemoglu, Johnson and Robinson (2001, 2002). We also emphasize the role played by the institutional environment. Instrumental variables estimates for post-colonial societies reveal that the strength of the state, as proxied empirically by an index of bureaucratic quality, exerts a strong preventive effect on rebellion. On the other hand, working institutions also influence the likelihood of rebellion indirectly, through mobilization. Our estimates suggest that this indirect effect increases rebellion. As such, the total net effect of better institutions on rebellion is ambiguous.

## 1 Introduction

Over the past several decades, civil conflicts have constituted one of the major concerns of scholars in the field of political violence. Recent tragedies, such as the bloody wars in ex-Yugoslavia and Rwanda, have contributed to a high degree of attention being paid both by academics and the public to the issue of ethnopolitical rebellion. Among political scientists, the debate has largely been articulated around the grievances-mobilization nexus.

A first approach, personified by Gurr (1968, 1970, 1993a, 1994), places grievances in the driver's seat. The principal cause of political violence is assumed to be the discrepancy between a group's aspirations and its achievements, often referred to as relative deprivation. The crux of Gurr's work has been ethnopolitical rebellion, in large part thanks to his creation of the *Minorities At Risk* (henceforth, MAR) database, which documents the situations faced by minority groups worldwide. Pervasive poverty, various forms of discrimination, or unemployment affecting a population creates the necessary and sufficient conditions for upheaval through an underlying mechanism which is essentially psychological. This vision was challenged by the proponents of the "mobilization approach", personified by Tilly (1975, 1978). According to this alternative view, the necessary condition for violence is the capacity for a group to organize its interests. The presence of grievances among groups is too frequent in practice for it to be able to predict the outbreak of episodes of violence. A typical example is given by Jenkins and Perrow (1977) who explain that farm workers revolted in the late 1960s and not in the 1940s because of differences between the two decades in terms of their capacity for mobilization, whereas the level of their grievances was comparable throughout the period. Besides contrasting these two approaches, a number of scholars have tried to synthesize them, in particular by assuming that grievances affect mobilization, while both grievances and mobilization affect rebellion (see, for example, Gurr (1993b)).

A number of studies have tried to disentangle the puzzle econometrically. Broadly speaking, one can distinguish two approaches. A first strand of the empirical literature confines its attention to single-

equation techniques. Examples include Collier and Hoeffler (2004), Reynal-Querol (2002) and Fearon and Laitin (1999, 2003) whose dependent variable is the outbreak of civil war. In these studies, identification is "achieved" by lagging the explanatory variables suspected of endogeneity, without resorting either to an explicit structural model or to a clearly motivated identification strategy. A second strand of the literature, typified by Gurr (1993b), Lindström and Moore (1995), or Gurr and Moore (1997) adopts a simultaneous equation approach in which the interractions between key variables are explicitly specified as are the exclusion restrictions that result in identification. The main goal of the present paper is to attempt to clarify the identification strategy that must be adopted be it in a limited (single equation) or full-information (simultaneous equation) context. Roughly speaking, our proposed identification strategy is based on introducing institutional factors explicitly into the analysis.

The first point that we make in this paper is that accounting explicitly for the institutional environment is both conceptually important and empirically necessary if one is to consistently estimate the parameters of interest in a model such as Gurr and Moore's. North (1990) defines institutions to be "the rules of the game in a society, or, more formally, [as] the humanly devised constraints that shape human interactions". Acemoglu, Johnson, and Robinson (2001, 2002), Engerman and Sokoloff (1997, 2005) and Banerjee and Iyer (2005), among others, show that institutional arrangements are one of the main determinants of the observed pattern of economic development worldwide. Acemoglu, Johnson and Robinson (2001, henceforth, AJR), in a widely-cited article, show that the form taken by colonization in the nineteenth century has had a persistent and quantitatively important impact on the GDP per capita of the colonized countries right up to the 1990s. They distinguish "extractive" institutions from "settlement" institutions. In the former case, the colonial power faced a high rate of settler mortality and often disposed of valuable natural resources in the colony. It therefore built a barebones administration whose sole goal was to secure the fruits of colonization and repatriate profits to the home country. In the latter case, in which the aforementioned conditions were reversed, colonization took the shape of stable and substantial settlement by white colonists, who proceeded to create institutions mimicking those of the colonial power.

The upshot is that when institutions are extractive, economic development does not obtain, whereas institutions of the "settlement" type have yielded the so-called neo-Europes (the USA, Canada, New Zealand and Australia). Given that the institutional environment is such an important determinant of economic development, it seems reasonable to posit that it is an important determinant of conflict as well, in that many of the same incentives are at work. More specifically, our hypothesis is that when extractive institutions are in place, it is likely that the state confines its control to areas of economic value (such as mining, see Herbst (2000)) and is unlikely to furnish growth-promoting public goods since its role is largely confined to rent-seeking (McGuire and Olson (1996)). According to Fearon and Laitin (2003), lack of control by the state over its jurisdiction as a whole is conducive to conflict, while dependence on natural resources has been found to be an important determinant of conflict both by Collier and Hoeffler (2004) and Collier, Elliott, Hegre, Hoeffler, Reynal-Querol, and Sambanis (2003).

The second point, which is related to the first, is that omitting institutional variables, as is done in many empirical papers on the determinants of rebellion, may lead one to identify a spurious correlation between two variables that is largely driven by a third, omitted, variable that influences both. A case in point is provided by the link between GDP per capita and the outbreak of civil war. In general, and in an effort to avoid problems of reverse causality, GDP per capita is often lagged by one period in a rebellion equation. But if GDP per capita and the outbreak of civil war are both explained by institutions, and institutions (which are likely to be highly persistent) are left out of the specification, then any purported link between GDP per capita and the outbreak of civil war may not, in fact, exist. In this paper, we attempt to deal with just this sort of problem through our use of the AJR instrument set in the framework of a simultaneous equations model.

In what follows, we base ourselves on the model of Gurr and Moore (1997), which consists of four endogenous variables (and thus four structural equations): rebellion, mobilization, repression and grievances. Gurr and Moore (henceforth, GM) estimate the system by three-stage least squares (3SLS) and show that mobilization affects rebellion, contrary to grievances, which do not. Grievances, on the other hand, are a strong predictor of mobilization. To begin with, we reconsider their identification strategy, which is based in part upon the assumption that political and economic discrimination are exogenous. We argue that this maintained hypothesis is potentially dubious. We then propose to endogenize the discrimination variables by instrumenting them using the AJR instrument set. Though the results we obtain are unconvincing in terms of the underlying identification strategy (more specifically, the AJR instruments do not appear to be sufficiently "strong" predictors of the discrimination variables), they do highlight the key role played by institutions. In particular, bureaucratic quality appears to exert a significant negative effect on rebellion, leading us to delve more deeply into the relationships linking institutions, mobilization and grievances. Setting aside the instrumentation of the discrimination variables (and thus appealing to the same exogeneity assumption as GM), we focus on the structural role played by institutions, and include them in the mobilization and grievances equations. Our main finding within the 3SLS context is that bureaucratic quality exerts a significant positive effect on mobilization. Its net effect on rebellion is then ambiguous.

As a test of the robustness of our findings, we relax our functional assumptions and consider two-stage least squares (2SLS) estimation of each individual equation. Though this results in a loss of efficiency, in that we do not exploit the information stemming from the correlations among the disturbance terms of all four equations, there is reason to be cautious concerning results based on 3SLS. This is because, in contrast to single-equation methods, 3SLS can result in the "contamination", through the joint variance-covariance matrix, of all of the results even if *only one* of the equations in the system is mis-specified. The outcome of this exercise is that our earlier results regarding institutions based on the 3SLS specification are confirmed, and that the omission by GM of the institutional variables in several of their equations is an unwarranted restriction.

As a final robustness check, we consider whether functioning institutions increase legally-based mobilization at the expense of its military counterpart. Having found no evidence of such a phenomenon, we conclude that good institutions do indeed have an ambiguous effect on rebellion.

The outline of the paper is as follows. In section 2 we briefly summarize the theoretical approaches based on grievances on the one hand, and mobilization on the other, as well as the attempts to synthesize the two. In section 3 we discuss the identification strategy adopted by GM as well as our initial approach based on endogenizing the discrimination variables. In section 4 we present our 3SLS estimation results and compare them with the GM specification. Section 5 is devoted to ascertaining whether the relationships that we identified, linking institutions, mobilization and grievances; using 3SLS, hold up to more robust single equation methods. We also delve more deeply into the relationship between institutions and mobilization. Section 6 concludes.

## 2  Grievances *versus* mobilization

The influential work of Gurr (1968, 1970, 1973) led to a widely-held belief that relative deprivation, also referred to as grievances, was the principal cause of political violence. Based on the frustration-aggression model of Davies (1962), Gurr (1968) defined relative deprivation as the perception by members of a group of a cleavage between their aspirations (in terms of what they perceive to be their rightful lot, materially and politically) and their capacities (that which they can actually achieve). For Gurr, as well as for Galtung (1964) or Feierabend and Feierabend (1966, 1972), such cleavages are the sources of

violent collective action.

This approach was put in doubt by Snyder and Tilly (1972), Oberschall (1973), Tilly (1975, 1978), Gamson (1975), Jenkins and Perrow (1977), McCarthy and Zald (1977) and Collier and Hoeffler (2004), who highlighted the key role played by mobilization as a source of conflict. Violent collective action is no longer seen as an "irrational" consequence of frustration, but rather as the result of cool economic calculus. The creation and survival of a critical mass of violent armed individual depends on their ability to generate private benefits through their actions, as has been stressed recently by Collier and Hoeffler, leading to a further weakening of the grievances hypothesis.

The Tilly *versus* Gurr dichotomy has led to a number of attempts at compromise, either by including mobilization in a theory of relative deprivation (Korpi (1974), Moore and Jaggers (1990), Gurr (1993a, 1993b, 1997)), or by recognizing that grievances can facilitate mobilization. Gurr (1993b), for example, assumes that relative deprivation simultaneously affects rebellion (protest) and mobilization; relative deprivation and mobilization, in turn, then both affect the intensity of rebellion. On the other hand, his empirical results do not allow one to reject the null hypothesis that grievances have a direct impact on rebellion.

Lindström and Moore (1995) have called Gurr's (1993b) empirical strategy into doubt and suggest a simultaneous equations approach, which is also implemented with minor changes in Gurr and Moore (1997). Their principal empirical finding is that grievances do not have a direct effect on rebellion, in contrast to mobilization, which thereby becomes the key determinant of violent collective action. Moreover, the relative deprivation variables (economic and political discrimination) increase mobilization, thereby indirectly influencing (and increasing) violence.

# 3   Identification strategy

## 3.1   The Gurr and Moore approach

The empirical basis for both Lindström and Moore (1995) and GM is the estimation by 3SLS of a system of four equations: rebellion (protest), grievances, mobilization and repression (or group coherence). All variables stem from the MAR dataset.

In order to render our results comparable with those of GM, we begin by adopting their empirical framework, though we shall consider the instrumentation issue in greater detail. Ignoring intercepts, their basic econometric specification is then given by:

$$
\begin{aligned}
Rebellion \quad = \quad & \beta_{11}Grievances + \beta_{12}Mobilization \\
& +\beta_{13}DemocraticPower + \beta_{14}InternationalRebellion
\end{aligned}
\tag{1}
$$

$$
Mobilization \quad = \quad \beta_{21}GroupCoherence + \beta_{22}Repression + \beta_{23}Grievances
\tag{2}
$$

$$
\begin{aligned}
Grievances \quad = \quad & \beta_{31}PoliticalDiscrimination + \beta_{32}EconomicDiscrimination \\
& +\beta_{33}DemographicDistress + \beta_{34}LostAutonomy + \beta_{35}PastRepression
\end{aligned}
\tag{3}
$$

$$
Repression \quad = \quad \beta_{41}Democracy + \beta_{42}PastRepressionSuccess
\tag{4}
$$

Our first econometric critique of the GM approach focuses on the grievances equation which potentially suffers, in our opinion, from significant endogeneity bias, given that it is difficult to argue that the two discrimination variables are exogenous. Intuitively, observed levels of discrimination stem from a rational decision by the state which is the outcome of a trade-off between institutional constraints on discriminatory behavior and the ability of the minority to resist. As such, excluding rebellion from the determinants of discrimination is untenable, leading to a failure of their identification strategy.

The ability to discriminate is an increasing function of effective political power. Following Acemoglu, Johnson, and Robinson (2005) and Acemoglu and Robinson (2005, 2006), political power can be divided into *de jure* power (defined by constitutional constraints) and *de facto* power (which includes the ability of a minority to subject the state to costs). As an illustration of the trade-off between these two forms of power, Acemoglu and Robinson (2000) argue that it was only under the threat of worker revolt that the United Kingdom progressively extended the franchise during the course of the 19th century. Aumann and Kurz (1977) argue that a defeated minority can destroy its assets, while Acemoglu (2005) suggests that minorities may choose to evade their taxes. In the same paper, Acemoglu (2005) associates *de facto* power with the ability of the minority to engage in successful and violent rebellion, as in Grossman and Noh (1990). In the absence of minority *de facto* power, the state sets its taxation rate at the maximum level that is compatible with the Laffer curve (McGuire and Olson (1996)), and this remains potentially true in terms of other forms of discrimination. The upshot is that one would expect, in countries with working institutions and where the state is strong, to see, *ceteris paribus*, a greater capacity to discriminate.

## 3.2   The *AJR* instruments

Our identification strategy is based on the instruments initially introduced by Acemoglu, Johnson, and Robinson (2001). In particular, we assume that settler mortality at the time of colonization, as well as democracy, constraints on the executive, the proportion of white settlers in 1900, and population density in 1500, affect current levels of rebellion only *indirectly* through their impact on discrimination.

In order to be admissible, an instrumental variable must satisfy two conditions. First, it must be correlated with the endogenous variable, once other exogenous covariates have been "partialled out" of the specification. This is known as the issue of instrument "strength" or "weakness", and has been the object of a great deal of recent econometric research.[1]   Second, a valid instrument must be orthogonal with respect to the disturbance term of the structural equation, meaning that it must have no *direct* effect on the dependent variable. This is known as an "exclusion restriction" in that it must be theoretically and empirically palatable for the instrument in question to be excluded from the structural equation that one is interested in estimating. Combining both conditions implies that a valid instrumental variable must only affect the dependent variable *indirectly* through the jointly endogenous right-hand-side variable. In section 1, we mustered various heuristic arguments that would lead one to expect a link between the AJR instruments and various measures of discrimination. The validity of the exclusion restrictions, on the other hand, is predicated on controlling for observable covariates that may be correlated with the AJR instruments and which appear in the rebellion equation. Such covariates include ethnolinguistic fragmentation, GDP per capita, and institutions, the latter being proxied by variables that quantify law and order and bureaucratic quality. In order to increase the likelihood that the exclusion restrictions on the AJR instruments are valid, we systematically control for these variables each time the AJR instruments come into play.

# 4   Results based on 3SLS

## 4.1   Discrimination variables assumed exogenous

Results are presented in Table 1. In column (1), we reproduce the GM results, while in column (2) we keep their specification while restricting ourselves to the subsample constituted by ex-colonies. The subsample of ex-colonies is almost exclusively constituted by developing countries except for three of

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[1] See also the excellent survey by Hahn and Hausman (2003), and a recent very short primer on the ensuing biases by Hahn and Hausman (2002).

the four so-called neo-Europes: Australia, the United States and Canada. As Australia and Canada disappear when additional variables are included, we decided to exclude the United States from the estimations in order to preserve a homogeneous sample of developing countries.[2]

As should be obvious, very little changes with respect to the GM results when estimating over this subsample. In particular, in the rebellion equation, grievances remain statistically indistinguishable from zero, mobilization continues to exercise a positive and statistically significant impact (with the point estimate being even larger than that in the original GM results), and the coefficient associated with democratic power is negative and statistically significant at usual levels of confidence. The only minor difference is that the coefficient associated with international rebellion is estimated less precisely, although the point estimate is very similar.

In the mobilization equation, all variables continue to be statistically significant as in GM, while the magnitudes of the point estimates are somewhat smaller. In the grievances equation, the point estimates associated with demographic distress, lost autonomy, and past repression, as well as the associated standard errors, are similar to those reported by GM, while the statistical significance of the discrimination variables is enhanced: in GM, economic discrimination has a positive and statistically significant impact on grievances, while the effect of political discrimination is negative and statistically indistinguishable from zero. For the ex-colonies subsample, in contrast, political discrimination exerts a negative, and statistically significant, effect on grievances while the effect of economic discrimination is still significant. Finally, in the repression equation, democracy continues to be statistically insignificant, while past repression success increases repression in a statistically significant manner for both samples.

## 4.2   Discrimination variables assumed jointly endogenous

In column (3) of Table 1, political and economic discrimination are allowed to be endogenous, and we achieve identification using the AJR instrument set. The coefficient associated with grievances in the rebellion equation becomes positive and statistically significant. Conversely, the effect of international rebellion vanishes, while the coefficient associated with mobilization is divided by more than three, though it remains statistically significant at the usual levels of confidence. The effect of democratic power is still indistinguishable from zero, as in GM.

Allowing the discrimination variables to be jointly endogenous increases their associated coefficients markedly. For political discrimination, the coefficient increases ten-fold, going from $-0.36$ to $-3.69$. For economic discrimination, the increase is less impressive, though still substantial, with the coefficient increasing from 0.52 to 2.40. As is to be expected once a variable is allowed to be jointly endogenous, the associated standard errors also increase, but to a lesser extent than the coefficients themselves.

In terms of the other equations that make up the system, very little changes except that the coefficients associated with group coherence and repression in the mobilization equation increase, with the former becoming statistically significant. The quantitative impact of lost autonomy increases in the third equation, while the coefficient associated with past repression success (in the repression equation) falls and is no longer statistically significant.

In summary, instrumenting the discrimination variables leads to grievances becoming significantly positive in the rebellion equation as well as strengthening the impact of the discrimination variables on grievances. On the other hand, the specification presented in column (3) is questionable in that variables that are potentially affected by the instruments are not included. If those variables influence rebellion, then the exclusion restrictions that underly our results will no longer be valid. As such, columns (4) to (7) sequentially increase the richness of the specification of the rebellion equation, by adding the

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[2]The results are very similar if these countries are kept in the sample, except for specifications that include our institutional variables. We will discuss this point in greater detail in the next sections.

logarithm of GDP per capita (column (4)), ethnolinguistic fragmentation (column (5)), law and order (column (6)), and bureaucratic quality (column (7)). These last two variables should in large part control for the state of institutions today. Given that it is highly unlikely that GDP per capita and the current state of institutions are exogenous in this setting (the level of rebellion should affect both wealth and institutions), both GDP per capita and the institutional variables are also allowed to be jointly endogenous. We have enough degrees of freedom to do this because of the wealth of the AJR instrument set.

When GDP per capita is added in column (4), the coefficient associated with this variable displays the expected (negative) sign but the point estimate is very imprecise. The remaining results are unchanged with respect to the baseline specification. When we add ethnolinguistic fragmentation in 1960 in column (5) (the form taken by colonization may have affected the ethnic diversity of the population), its effect is indistinguishable from zero and the other coefficients and standard errors are unaffected.

Finally, the two last columns add the institutional variables. In column (6), law and order appears to have no effect on rebellion while all other coefficients remain unchanged. The exception is constituted by the coefficients associated with political and economic discrimination, which are significantly lower, though still statistically significant at the usual levels of confidence. This confirms that part of the effect of the instruments was incorrectly attributed to discriminations in the previous regressions.

When bureaucratic quality replaces law and order in column (7), interesting changes in the results appear. First, the impact of grievances in the rebellion equation diminishes drastically and is no longer statistically significant. Conversely, the coefficient associated with mobilization increases to 1.79 and is estimated more precisely. Second, bureaucratic quality exerts a significantly negative effect on rebellion. Third, the points estimates associated with political and economic discrimination in the grievances equation return to the levels they displayed in columns (3) to (6).

Table 2 presents the first-stage regressions that correspond to the 3SLS results reported in Table 1. As should be apparent, the instruments perform very poorly, explaining no more than 7% of the variance of the discrimination variables. As such, we are very far from the recommendations of Stock, Wright, and Yogo (2002), namely, a partial $R^2$ of 20% and a partial $F-$statistic of 10. In addition, there is reason to be suspicious of the results presented in columns (3), (4) and (5) of Table 1. Given that these results do not control for the other channels through which the AJR instruments may also operate, the coefficients associated with discrimination are likely to be upwardly biased. When we add bureaucratic quality, which is highly correlated with the AJR instruments, the effect of both forms of discrimination on rebellion vanishes, revealing that most of the impact attributed to discrimination in columns (3-5) actually stemmed from the omission of controls for the institutional environment. Given that law and order would appear to have no effect on rebellion, only the last column of Table 1 can be said to satisfy the exclusion restrictions that identify our specification.

To a certain extent, our results show that the GM findings are robust: grievances only affect rebellion indirectly through mobilization, while the latter is highly significant in the rebellion equation. The contribution of the preceding discussion, however, has been to highlight the importance of taking the institutional context into account, with our preferred proxy being bureaucratic quality. In the next subsection, we delve more deeply into this question by investigating whether institutions have an impact on mobilization and grievances as well.

## 4.3 Institutions, mobilization and grievances

Table 3 reports 3SLS results in which institutions appear only in the mobilization equation (columns 1-2), in the rebellion and mobilization equations (columns 3-4) and in the rebellion, mobilization and grievances equations (columns 5-6). The discrimination variables are allowed to be exogenous given that

we showed above that endogenizing these variables leads to a severe weak instruments problem.[3] As should be obvious from the results presented in columns (1) and (2), our previous insights concerning the rebellion equation are preserved when institutions enter the mobilization equation instead of the rebellion equation: grievances have little or no direct effect on rebellion, while they affect mobilization. Somewhat surprisingly, bureaucratic quality appears to significantly increase mobilization, whereas the effect of law and order is statistically indistinguishable from zero. In the grievances equation, the coefficient associated with political discrimination is negative and statistically significant, whereas the coefficient associated with economic discrimination is statistically indistinguishable from zero, as in GM.

The specifications presented in columns (3-4), where institutions enter both the mobilization and the rebellion equations, confirm the results of columns (1-2). The only notable difference is that the logarithm of GDP per capita is now (surprisingly) positive in the rebellion equation when bureaucratic quality is the proxy for the current institutional context.

Columns (5-6) report results in which institutions enter the first three equations. While all results remains stable with respect to columns (3-4), it is apparent in column (6) that the coefficient associated with bureaucratic quality becomes insignificant in the mobilization equation whereas the corresponding coefficient in the grievances equation is positive and statistically significant. Once again, law and order is insignificant in all equations.

In our discussion of our identification strategy of section 3.1, we argued that strong states should be more able to discriminate against or tax minorities. An efficient and pliable administration is a prerequisite for such policies to be implemented. If the maximization of the ruling elite's welfare implies a high level of taxation of minorities, it is necessary to possess an efficient bureaucracy that can collect taxes locally and hand them over to central authorities. Thus, predatory policies are predicated on the central government being able to impose its authority upon peripheral areas of the country. As such, bureaucratic quality should, indirectly, increase rebellion. In columns (3-4), bureaucratic quality is positively associated with mobilization, which may at first seem surprising as there is no obvious direct link between the two. However, the results reported in columns (5-6) reveal that bureaucratic quality significantly increases grievances, while its effect on mobilization is no longer statistically significant.

An obvious condition for the previous line of reasoning to hold water is that a system of democratic checks and balances on the central government's authority is lacking, thereby allowing the state's bureaucracy to be used in a predatory manner. Given that the sample of countries being considered here is largely drawn from the developing world, and does certainly not correspond to what would be termed "democracies" in the western sense of the word, this assumption is likely to be reasonable.

Table 4 presents the first-stage reduced forms that correspond to the previous set of 3SLS results. The endogenous variables that we focus on are law and order and bureaucratic quality. In contrast to the discrimination reduced forms presented in Table 2, the quality of the instrument set is much more satisfactory, with the AJR instruments explaining 31% of the variation of law and order and 13% of bureaucratic quality. The corresponding partial $F-$statistics are close to the critical values advocated by the usual rules of thumb alluded to above.

The upshot of this section is that the complex interplay among rebellion, mobilization and grievances is both enriched and complicated when institutions are taken into account. On the one hand, it would appear that the institutional environment was a crucial omitted variable in the GM framework. Institutions, captured here by bureaucratic quality, exert a powerful preventive effect on rebellion, which one might term the "direct deterrence effect". When minorities face a strong state characterized by an efficient bureaucracy, there is little room to engage in military adventures. Fearon and Laitin (2003) attributed this role to GDP per capita, which is negatively associated with the likelihood of civil conflict

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[3]Note, however, that the results presented in this section remain largely unchanged even when we assume that the discrimination variables are endogenous. The corresponding results are available upon request.

in almost all cross-country regressions. The results presented here suggest, on the other hand, when institutions and GDP per capita are *both* taken into account, that the latter is insignificant whereas the former approximates the deterrence effect of state power. Moreover, bureaucratic quality also influences rebellion indirectly, through mobilization and grievances. Such indirect effects lead to an increase in the likelihood of conflict, probably because strong states are more prone to adopt predatory policies against minorities and since such states are less vulnerable to rebellions. Another way of putting this is that a strong state implies that rebellions do not constitute a serious threat to the authorities in power. There is an apt analogy here with the political economy of taxation literature (see, e.g., the classic paper by Buchanan and Faith (1987)): when the threat of secession is low, the level of taxes is high. The only minor difference here is that, in our analysis, the threat in question is not constituted by secession *per se*, but by the deleterious effects of the *attempted* secession.

One potential weakness of the analysis presented in the preceding sections is that (i) we restrict mobilization to an aggregate measure, without distinguishing between its military and institutional incarnations and (ii) that the simultaneous equation (full information) setup is predicated on the correct specification of *all four* equations that go into the model. The first point is that working institutions may increase the likelihood of mobilization through legal channels, while reducing mobilization that takes on a military form. In other words, the preceding analysis could be driven by aggregation bias over the form taken by mobilization. The second point is essentially econometric in nature. Though the 3SLS procedure increases efficiency by exploiting the variance-covariance matrix of the disturbance terms of all four equations, it is "fragile" in that specification error in one equation can be transmitted to the other equation, even if they are correctly specified. Disaggregating our measure of mobilization and adopting a less demanding 2SLS approach are therefore the topics of the next section.

# 5 Results based on 2SLS

## 5.1 Institutions, mobilization and rebellion

Tables 5, 8 and 9 present the results of the GM model estimated by 2SLS. In the first column of each table, we report a benchmark OLS specification. In Table 5 we present results corresponding to the rebellion equation. All variables are highly significant and display the expected signs, except for grievances, which are statistically insignificant. Column (2) reports the 2SLS estimation of the rebellion equation as it appears in the GM model. The coefficients associated with mobilization and repression increase dramatically with respect to OLS, while the effects of democratic power and international rebellion become statistically indistinguishable from zero. Note that the Hansen test of the overidentifying restrictions rejects, as shown by the extremely low reported $p-$value. Column (3) adds GDP per capita and makes use of the AJR instrument set. Column (4) adds institutions. In contrast to the specification of column (2), the overidentifying restrictions are not rejected, thereby providing support for our earlier intuition that the absence of GDP per capita and institutions in the GM model leads to severe omitted variable bias. While the overidentifying restrictions are no longer rejected, introducing GDP per capita and institutions leaves the basic results unchanged: repression, institutions and mobilization are all statistically significant determinants of rebellion, whereas grievances are not.

Results of the corresponding first-stage reduced forms are reported in Tables 6 and 7. As is apparent in the columns labelled "(2)" (so as to correspond to column (2) of Tables 5, 8 and 9, which report the results that correspond to the GM specification for the structural equations) the quality of the GM identification strategy is questionable, with the grievances equation being the only one in which the partial $R^2$ and partial $F-$statistics achieve appropriate levels. Economic discrimination, demographic distress and past repression are significantly correlated with grievances and induce a substantial exogenous varia-

tion in grievances. The instrument for mobilization, group coherence, is significantly associated with this endogeneous variable, but produces a low partial $R^2$ (5%). *None* of the instrumental variables appear to offer any identification for repression. In contrast, when GDP per capita and bureaucratic quality are added to the specification, the identifying power of the instruments is reduced somewhat for grievances but improves substantially for mobilization. Finally, as has been known since the publication of their highly influential papers, the AJR (2001, 2002) colonization instruments explain more than 60% of the variation in GDP per capita while the associated partial $F-$statistic is equal to 25%. For the case of bureaucratic quality, the reduced form is the same as the one presented in Table 4.

Table 8 reports similar results, but for the mobilization equation. Using OLS, only grievances are a significant determinant of mobilization. This remains true when one moves to 2SLS, with the coefficient associated with grievances being larger. In our preferred specification, which is reported in column (4), GDP per capita exerts a negative and significant effect on mobilization, while the opposite is true for bureaucratic quality. This result confirms our finding of section 4, concerning the two-pronged effect of institutions on rebellion. On the one hand, a good institutional environment deters rebellion by minorities while, on the other, the same institutional environment encourages the formation of organizations representing the minority. At first glance, it would appear to be reassuring that bureaucratic quality promotes institutional lobbying at the expense of military activities. But once one recalls, from our previous results, that mobilization promotes violent conflict, the net effect of working institutions becomes ambiguous. At this stage in the analysis, however, we are unable to distinguish between legal (institutional) and illegal (military) forms of mobilization. Similarly, we do not know whether these two types of mobilization differ in terms of their impact on rebellion. This question will be dealt with in the last section of the paper.

Finally, Table 9 presents OLS and 2SLS results for the GM grievances equation. The endogenous variables that we add are statistically insignificant while the test of the overidentifying restrictions rejects. Contrary to the two previous equations, the GM grievances specification would therefore not appear to suffer from omitted variable bias.

## 5.2 The nature of mobilization

The MAR dataset codes mobilization (in terms of the organizations that represent the minority group) as follows: 1 for open political organizations, 2 for non-legal and non-militant organizations, 3 for non-legal and militant organizations and 4 for clandestine and militant organizations. So as to ascertain whether the effect of institutions on mobilization is differentiated by the type of mobilization at work, we replace the previous mobilization variable either by the type of mobilization (as coded in the MAR dataset —this is an average of the scores attributed to the various groups that purportedly represent a given minority) or by an interactive variable given by the original mobilization variable times the type of mobilization involved. The "type (continuous)" mobilization variable is therefore increasing in the violent and illegal nature of the organizations representing a given minority group. A second mobilization variable can be constructed as a dummy which is equal to 1 when the average score of the organizations representing the minority group corresponds to the militant category (i.e. the average score is strictly greater than 2), and zero otherwise; we refer to this as the "type (binary)" variable. A third mobilization variable is constructed by multiplying the original mobilization variable by the "type (continuous)" variable.

We report 2SLS results in Table 10. Results based on 3SLS (not reported) are similar. In the right-hand portion of the table, we omit ethnolinguistic fragmentation from the specification in order to ascertain whether this variable, which is often associated with violent mobilization, is driving the results.

Several findings stand out. First, only GDP per capita has a statistically significant impact on the

type of mobilization, whether it appears in continuous or in binary form. The richer a country is, the less groups organize themselves into violent organizations. Hence, GDP per capita, which does not significantly affect mobilization when this concept is taken at the aggregate level (see Sections 3 and 4 above), *does* affect the *form* taken by mobilization. Our empirical results therefore suggest that economic development is a manner of deterring the formation of violent and clandestine organizations in favor of groups that operate within the confines of the law. Second, bureaucratic quality has no significant impact on the form taken by mobilization. Given our previous findings that bureaucratic quality is a significant determinant of mobilization as a whole, this implies that the effect of institutions on mobilization was not driven by aggregation bias.

A robustness check of these results is provided by columns (3) and (6) of Table 10. Here, the dependent variable is mobilization weighted by the type taken by the organization. Given the manner in which type is coded in the MAR database, more weight is given to violent organizations than to those of a legal ilk. If institutions influenced mobilization solely through legal organizations, then the coefficient associated with bureaucratic quality in these regressions should vanish or, at least, should decrease with respect to our previous findings. The corresponding coefficient reported in Table 5, 0.70, remains largely unchanged in column (3) (0.68) and in column (6) (0.83) of Table 10. Though the point estimates are of a similar magnitude, they are estimated much less precisely, with a standard error in column (3) that is sufficiently large for the coefficient to be statistically indistinguishable from zero.

# 6  Concluding Remarks

In this paper, we have reconsidered the well-known results of the Gurr and Moore (1997) simultaneous equations model of rebellion, mobilization, grievances and repression by focusing both on the validity of the underlying identification strategy, and on the impact of institutions on the structural equations themselves. We have argued that institutions are likely to influence rebellion and mobilization given their key roles in shaping the nature of the state as well as the incentives for the ruling elite to protect property rights and adhere to democratic norms.

Adding institutional variables to 3SLS and 2SLS estimation of the GM model suggests that they exert an ambiguous effect on rebellion. On one hand, bureaucratic quality directly prevents rebellion, probably through a deterrence effect linked to the strength of the state and its bureaucratic (including its military) apparatus. On the other hand, bureaucratic quality increases mobilization, which is itself an important determinant of rebellion. This effect of bureaucratic quality does not appear to be due to the emergence of institutional lobbying in response to a better institutional climate. To the contrary, working institutions increase all types of mobilization, probably as a result of predatory policies pursued by the state. Such policies are impossible to implement in the absence of an efficient and pliable bureaucracy at the service of the ruler. As such, bureaucratic quality, *ceteris paribus*, would appear to be a necessary condition for predatory policies, with these predatory policies provoking mobilization.

The findings reported in this paper have identified a reduced-form relationship, directly linking state power to mobilization. What is lacking is an intermediate relationship connecting bureaucratic quality to the type of policies that are implemented, given that it must be these policies that affect grievances and mobilization. Contrary to our initial intuition, discrimination and grievances do not react to bureaucratic quality. Identifying the specific channels through which state power affects policies will be a stimulating topic for future research.

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| Sample | Original | | Ex-colonies | | | | |
|---|---|---|---|---|---|---|---|
| Discrimination variables assumed | Exogenous | | Endogenous | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| *Equation 1: Rebellion* | | | | | | | |
| Grievances | −0.13 (0.12) | −0.51 (0.25) | 0.59 (0.18) | 0.69 (0.19) | 0.67 (0.21) | 0.98 (0.34) | 0.13 (0.26) |
| Mobilization | 1.83 (0.41) | 3.12 (0.71) | 0.89 (0.31) | 0.78 (0.31) | 0.75 (0.29) | 0.79 (0.45) | 1.79 (0.35) |
| Democratic Power | −0.05 (0.01) | −0.05 (0.02) | −0.07 (0.02) | −0.06 (0.02) | −0.06 (0.02) | −0.06 (0.03) | −0.01 (0.03) |
| International Rebellion | 0.57 (0.16) | 0.46 (0.27) | −0.03 (0.24) | −0.18 (0.26) | −0.13 (0.26) | −0.21 (0.30) | 0.21 (0.30) |
| GDP per capita | | | | −0.58 (0.48) | −0.64 (0.69) | −0.73 (0.53) | 0.63 (0.69) |
| Ethnolinguistic Fragmentation | | | | | 0.00 (0.01) | 0.01 (0.02) | 0.02 (0.02) |
| Law and Order | | | | | | −0.01 (0.44) | |
| Bureaucracy Quality | | | | | | | −3.09 (0.86) |
| *Equation 2: Mobilization* | | | | | | | |
| Group Coherence | 0.27 (0.11) | 0.19 (0.15) | 0.49 (0.18) | 0.48 (0.18) | 0.60 (0.20) | 0.50 (0.24) | 0.67 (0.21) |
| Repression | −0.59 (0.31) | −0.46 (0.28) | −1.33 (0.35) | −1.43 (0.34) | −1.58 (0.36) | −1.19 (0.40) | −1.74 (0.40) |
| Grievances | 0.34 (0.05) | 0.41 (0.07) | 0.42 (0.07) | 0.43 (0.07) | 0.51 (0.09) | 0.63 (0.10) | 0.61 (0.10) |
| *Equation 3: Grievances* | | | | | | | |
| Political Discrimination | −0.04 (0.21) | −0.36 (0.26) | −3.69 (0.70) | −3.64 (0.71) | −3.00 (0.70) | −1.25 (0.71) | −3.17 (0.81) |
| Economic Discrimination | 0.67 (0.24) | 0.52 (0.28) | 2.40 (0.75) | 2.35 (0.74) | 2.10 (0.73) | 1.55 (0.84) | 2.69 (0.80) |
| Demographic Distress | 0.34 (0.07) | 0.34 (0.09) | 0.35 (0.10) | 0.36 (0.10) | 0.33 (0.10) | 0.32 (0.10) | 0.34 (0.10) |
| Lost Autonomy | 0.89 (0.30) | 0.60 (0.36) | 1.10 (0.47) | 1.10 (0.47) | 0.89 (0.50) | 0.57 (0.60) | 1.25 (0.54) |
| Past Repression Success | 0.48 (0.15) | 0.58 (0.17) | 0.60 (0.20) | 0.59 (0.20) | 0.51 (0.20) | 0.45 (0.21) | 0.25 (0.21) |
| *Equation 4: Repression* | | | | | | | |
| Democracy | −0.02 (0.01) | 0.01 (0.02) | 0.02 (0.02) | 0.01 (0.02) | 0.02 (0.02) | 0.02 (0.03) | 0.02 (0.02) |
| Past Repression Success | 0.34 (0.10) | 0.32 (0.14) | 0.24 (0.16) | 0.19 (0.16) | 0.16 (0.16) | 0.12 (0.21) | 0.14 (0.17) |
| Observations | 202 | 120 | 101 | 99 | 94 | 80 | 91 |

Table 1: Rebellion, mobilization, grievances and repression: 3SLS estimates

| Dependent variable | Political discrimination | | | | Economic discrimination | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Corresponding col. in Table 1 | (3) | (4) | (5) | (6) | (3) | (4) | (5) | (6) |
| *AJR* instruments | | | | | | | | |
| Settler mortality | −0.15 | −0.17 | −0.15 | −0.36 | −0.29 | −0.31 | −0.25 | −0.17 |
| | (0.15) | (0.15) | (0.16) | (0.20) | (0.15) | (0.15) | (0.16) | (0.19) |
| Democracy in 1900 | −0.05 | −0.05 | −0.06 | −0.21 | −0.18 | −0.18 | −0.22 | −0.27 |
| | (0.14) | (0.14) | (0.14) | (0.18) | (0.14) | (0.14) | (0.14) | (0.17) |
| Constr. on executive in 1900 | 0.00 | 0.00 | 0.02 | 0.16 | 0.09 | 0.09 | 0.18 | 0.25 |
| | (0.16) | (0.16) | (0.17) | (0.18) | (0.16) | (0.16) | (0.17) | (0.18) |
| Prop. of white settlers in 1900 | 0.00 | 0.00 | 0.00 | −0.01 | 0.00 | 0.00 | 0.01 | 0.01 |
| | (0.01) | (0.01) | (0.01) | (0.02) | (0.01) | (0.01) | (0.01) | (0.02) |
| Log of population density in 1500 | 0.01 | 0.01 | 0.00 | −0.19 | 0.05 | 0.04 | 0.03 | 0.09 |
| | (0.11) | (0.11) | (0.12) | (0.17) | (0.11) | (0.11) | (0.12) | (0.17) |
| Exogenous controls | | | | | | | | |
| Demographic Distress | 0.07 | 0.07 | 0.07 | 0.09 | 0.09 | 0.09 | 0.09 | 0.08 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| Lost Autonomy | 0.20 | 0.20 | 0.18 | 0.22 | −0.18 | −0.19 | −0.27 | −0.32 |
| | (0.15) | (0.15) | (0.16) | (0.16) | (0.15) | (0.15) | (0.16) | (0.16) |
| Past Repression | 0.04 | 0.04 | 0.01 | −0.06 | 0.26 | 0.26 | 0.23 | 0.20 |
| | (0.07) | (0.07) | (0.07) | (0.08) | (0.07) | (0.07) | (0.07) | (0.08) |
| International Rebellion | −0.27 | −0.26 | −0.23 | −0.28 | −0.29 | −0.28 | −0.26 | −0.27 |
| | (0.10) | (0.10) | (0.10) | (0.11) | (0.10) | (0.10) | (0.10) | (0.11) |
| Democratic Power | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | −0.01 | −0.01 | 0.00 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Ethnolinguistic Fragmentation | | | 0.00 | 0.01 | | | 0.01 | 0.01 |
| | | | (0.01) | (0.01) | | | (0.01) | (0.01) |
| Group Coherence | −0.13 | −0.14 | −0.17 | −0.12 | −0.17 | −0.18 | −0.18 | −0.22 |
| | (0.10) | (0.10) | (0.11) | (0.12) | (0.11) | (0.10) | (0.11) | (0.12) |
| Democracy | −0.07 | −0.06 | −0.07 | −0.06 | 0.03 | 0.03 | 0.02 | 0.00 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| Past Repression Success | 0.10 | 0.12 | 0.14 | 0.36 | −0.08 | −0.07 | −0.01 | −0.01 |
| | (0.16) | (0.16) | (0.18) | (0.20) | (0.16) | (0.16) | (0.17) | (0.20) |
| $R^2$ | 0.23 | 0.23 | 0.23 | 0.29 | 0.40 | 0.42 | 0.42 | 0.44 |
| $F$-statistic | 2.00 | 1.99 | 1.66 | 1.93 | 4.40 | 4.76 | 4.01 | 3.69 |
| "Partialled out" reduced form | | | | | | | | |
| $R^2$ | 0.02 | 0.02 | 0.01 | 0.07 | 0.06 | 0.07 | 0.06 | 0.06 |
| $F$-statistic | 0.32 | 0.36 | 0.25 | 1.15 | 1.33 | 1.47 | 1.20 | 1.00 |
| Observations | 101 | 99 | 94 | 80 | 101 | 99 | 94 | 80 |

Table 2: Reduced forms for political and economic discrimination

|                              | (1)              | (2)              | (3)              | (4)              | (5)              | (6)              |
| ---------------------------- | ---------------- | ---------------- | ---------------- | ---------------- | ---------------- | ---------------- |
| *Equation 1: Rebellion*      |                  |                  |                  |                  |                  |                  |
| Grievances                   | 0.36<br>(0.30)   | 0.48<br>(0.20)   | 0.43<br>(0.31)   | −0.31<br>(0.25)  | 0.45<br>(0.31)   | −0.18<br>(0.24)  |
| Mobilization                 | 1.40<br>(0.42)   | 1.08<br>(0.30)   | 1.29<br>(0.44)   | 2.47<br>(0.37)   | 1.28<br>(0.43)   | 2.43<br>(0.35)   |
| Democratic Power             | −0.04<br>(0.03)  | −0.04<br>(0.03)  | −0.04<br>(0.03)  | 0.02<br>(0.03)   | −0.03<br>(0.03)  | 0.02<br>(0.03)   |
| International Rebellion       | 0.18<br>(0.30)   | 0.02<br>(0.27)   | 0.20<br>(0.30)   | 0.48<br>(0.30)   | 0.19<br>(0.30)   | 0.35<br>(0.29)   |
| GDP per capita               | −0.23<br>(0.62)  | −0.77<br>(0.53)  | −0.27<br>(0.64)  | 1.28<br>(0.72)   | −0.30<br>(0.63)  | 0.77<br>(0.66)   |
| Ethnolinguistic Fragmentation| 0.00<br>(0.02)   | −0.01<br>(0.02)  | 0.00<br>(0.02)   | 0.02<br>(0.02)   | 0.00<br>(0.02)   | 0.01<br>(0.02)   |
| Law and Order                |                  |                  | 0.31<br>(0.41)   |                  | 0.61<br>(0.47)   |                  |
| Bureaucratic Quality         |                  |                  |                  | −4.51<br>(0.80)  |                  | −4.42<br>(0.78)  |
| *Equation 2: Mobilization*   |                  |                  |                  |                  |                  |                  |
| Group Coherence              | 0.44<br>(0.23)   | 0.52<br>(0.19)   | 0.45<br>(0.23)   | 0.46<br>(0.18)   | 0.42<br>(0.23)   | 0.42<br>(0.17)   |
| Repression                   | −0.83<br>(0.37)  | −1.21<br>(0.35)  | −0.87<br>(0.37)  | −1.05<br>(0.35)  | −0.84<br>(0.37)  | −1.01<br>(0.34)  |
| Grievances                   | 0.64<br>(0.09)   | 0.57<br>(0.09)   | 0.64<br>(0.09)   | 0.56<br>(0.09)   | 0.65<br>(0.09)   | 0.54<br>(0.09)   |
| Law and Order                | 0.17<br>(0.23)   |                  | 0.32<br>(0.26)   |                  | 0.36<br>(0.32)   |                  |
| Bureaucratic Quality         |                  | 0.58<br>(0.25)   |                  | 0.62<br>(0.25)   |                  | 0.30<br>(0.27)   |
| *Equation 3: Grievances*     |                  |                  |                  |                  |                  |                  |
| Political Discrimination     | −0.70<br>(0.30)  | −0.60<br>(0.28)  | −0.70<br>(0.30)  | −0.47<br>(0.31)  | −0.66<br>(0.30)  | −0.47<br>(0.28)  |
| Economic Discrimination      | 0.24<br>(0.32)   | 0.11<br>(0.29)   | 0.24<br>(0.32)   | 0.31<br>(0.31)   | 0.18<br>(0.32)   | 0.12<br>(0.29)   |
| Demographic Distress         | 0.37<br>(0.09)   | 0.40<br>(0.09)   | 0.37<br>(0.09)   | 0.39<br>(0.09)   | 0.35<br>(0.09)   | 0.37<br>(0.09)   |
| Lost Autonomy                | 0.42<br>(0.40)   | 0.39<br>(0.37)   | 0.43<br>(0.40)   | 0.43<br>(0.39)   | 0.37<br>(0.39)   | 0.47<br>(0.36)   |
| Past Repression              | 0.49<br>(0.18)   | 0.59<br>(0.17)   | 0.48<br>(0.18)   | 0.44<br>(0.19)   | 0.50<br>(0.17)   | 0.54<br>(0.19)   |
| Law and Order                |                  |                  |                  |                  | −0.64<br>(0.42)  |                  |
| Bureaucratic Quality         |                  |                  |                  |                  |                  | 1.77<br>(0.51)   |
| *Equation 4: Repression*     |                  |                  |                  |                  |                  |                  |
| Democracy                    | 0.01<br>(0.03)   | 0.01<br>(0.02)   | 0.01<br>(0.03)   | 0.01<br>(0.02)   | 0.01<br>(0.03)   | 0.02<br>(0.02)   |
| Past Repression Success      | 0.16<br>(0.12)   | 0.22<br>(0.18)   | 0.15<br>(0.22)   | 0.16<br>(0.18)   | 0.17<br>(0.22)   | 0.20<br>(0.17)   |
| Observations                 | 80               | 91               | 80               | 91               | 80               | 91               |

Table 3: GM model augmented with institutions: 3SLS estimates

| Dependent variable | Law and Order | Bureaucratic Quality |
|---|---|---|
| Corresponding col. in Table 3 | (1-3-5) | (2-4-6) |
| *AJR* instruments | | |
| Settler mortality | −0.37 (0.25) | −0.36 (0.16) |
| Democracy in 1900 | 0.44 (0.22) | −0.24 (0.14) |
| Constr. on executive in 1900 | −0.21 (0.23) | 0.09 (0.16) |
| Prop. of white settlers in 1900 | −0.05 (0.02) | −0.01 (0.01) |
| Log of population density in 1500 | −0.74 (0.22) | −0.12 (0.12) |
| Exogenous controls | | |
| Political Discrimination | −0.15 (0.17) | 0.12 (0.12) |
| Economic Discrimination | −0.03 (0.17) | 0.09 (0.12) |
| Demographic Distress | 0.01 (0.04) | −0.03 (0.03) |
| Lost Autonomy | −0.19 (0.21) | −0.09 (0.16) |
| Past Repression | −0.02 (0.11) | −0.22 (0.08) |
| International Rebellion | 0.06 (0.15) | 0.06 (0.11) |
| Democratic Power | −0.04 (0.01) | 0.03 (0.01) |
| Ethnolinguistic Fragmentation | 0.02 (0.01) | 0.00 (0.01) |
| Group Coherence | 0.27 (0.15) | 0.14 (0.11) |
| Democracy | 0.04 (0.04) | −0.01 (0.03) |
| Past Repression Success | −0.05 (0.26) | 0.30 (0.17) |
| $R^2$ | 0.42 | 0.43 |
| $F$-statistic | 2.87 | 3.53 |
| "Partialled out" reduced form | | |
| $R^2$ | 0.31 | 0.13 |
| $F$-statistic | 6.81 | 2.63 |
| Observations | 80 | 91 |

Table 4: Reduced forms for rule of law and bureaucratic quality

| Dependent variable | Rebellion | | | |
|---|---|---|---|---|
| Estimator | OLS | 2SLS | | |
| | (1) | (2) | (3) | (4) |
| *Endogeneous* | | | | |
| Grievances | 0.03 (0.08) | −0.23 (0.30) | 0.14 (0.21) | −0.33 (0.31) |
| Mobilization | 0.79 (0.19) | 2.27 (0.73) | 1.20 (0.30) | 1.79 (0.52) |
| Repression | 0.93 (0.19) | 1.29 (0.80) | 1.82 (0.50) | 1.91 (0.75) |
| Log of GDP per capita | | | −0.46 (0.64) | 0.66 (0.98) |
| Bureaucratic Quality | | | | −3.02 (1.19) |
| Exogenous controls | | | | |
| Democratic Power | −0.05 (0.01) | −0.06 (0.08) | −0.05 (0.02) | 0.02 (0.04) |
| International Rebellion | 0.74 (0.21) | 0.27 (0.37) | 0.16 (0.25) | 0.46 (0.36) |
| Ethnolinguistic Fragmentation | | | −0.01 (0.02) | 0.01 (0.03) |
| $R^2$ | 0.45 | | | |
| $F$-statistic | 19.03 | 11.29 | 6.28 | 7.01 |
| Hansen $p-$value | | 0.06 | 0.37 | 0.96 |
| Observations | 120 | 111 | 94 | 91 |

Table 5: Rebellion equation: OLS and 2SLS estimates

| Dependent variable | Grievances | | | Mobilization | | |
|---|---|---|---|---|---|---|
| Corresponding col. in Tab. 5 | (2) | (3) | (4) | (2) | (3) | (4) |
| Instruments | | | | | | |
| Group coherence | | | | 0.35 (0.16) | 0.41 (0.15) | 0.41 (0.15) |
| Political Discrimination | 0.30 (0.36) | 0.12 (0.39) | −0.01 (0.41) | | | |
| Economic Discrimination | 0.66 (0.34) | 0.31 (0.39) | 0.37 (0.41) | | | |
| Demographic Distress | 0.23 (0.10) | 0.22 (0.11) | 0.26 (0.12) | | | |
| Lost Autonomy | 0.42 (0.48) | 0.66 (0.55) | 0.68 (0.55) | | | |
| Past Repression Success | 0.46 (0.23) | 0.34 (0.26) | 0.28 (0.27) | | | |
| Exogenous controls | | | | | | |
| Democratic Power | 0.02 (0.03) | 0.04 (0.04) | 0.04 (0.04) | 0.00 (0.01) | −0.02 (0.01) | −0.02 (0.01) |
| International Rebellion | 0.56 (0.26) | 0.23 (0.36) | 0.30 (0.37) | 0.46 (0.12) | 0.06 (0.15) | 0.11 (0.15) |
| Ethnolinguistic Fragmentation | | 0.01 (0.02) | 0.02 (0.02) | | −0.01 (0.01) | 0.00 (0.01) |
| Political Discrimination | | | | 0.15 (0.17) | 0.08 (0.16) | 0.01 (0.17) |
| Economic Discrimination | | | | 0.08 (0.16) | −0.01 (0.16) | 0.05 (0.17) |
| Democracy | 0.15 (0.09) | 0.04 (0.11) | 0.03 (0.11) | | | |
| Past repression Success | −0.34 (0.44) | 0.10 (0.57) | 0.04 (0.60) | | | |
| Group Coherence | 0.19 (0.34) | 0.10 (0.37) | 0.08 (0.37) | | | |
| Demographic Distress | | | | 0.09 (0.05) | 0.10 (0.05) | 0.11 (0.05) |
| Lost Autonomy | | | | −0.26 (0.22) | −0.03 (0.22) | −0.01 (0.22) |
| Past Repression Success | | | | 0.30 (0.11) | 0.36 (0.11) | 0.34 (0.11) |
| Settler mortality | | −0.54 (0.54) | −0.51 (0.54) | | −1.23 (0.22) | −1.21 (0.22) |
| Democracy in 1900 | | 0.17 (0.49) | 0.17 (0.49) | | 0.06 (0.20) | 0.07 (0.20) |
| Constr. on executive in 1900 | | −0.23 (0.56) | −0.18 (0.57) | | −0.33 (0.23) | −0.32 (0.23) |
| Prop. of white settlers in 1900 | | 0.10 (0.05) | 0.10 (0.05) | | −0.04 (0.02) | −0.03 (0.02) |
| Log of population density in 1500 | | 0.86 (0.39) | 0.80 (0.40) | | −0.03 (0.16) | −0.04 (0.16) |
| $R^2$ | 0.35 | 0.37 | 0.38 | 0.32 | 0.55 | 0.57 |
| $F$-statistic | 5.32 | 2.89 | 2.84 | 4.69 | 5.93 | 6.18 |
| "Partialled out" reduced form | | | | | | |
| $R^2$ | 0.19 | 0.13 | 0.13 | 0.05 | 0.09 | 0.09 |
| $F$-statistic | 6.22 | 2.54 | 2.56 | 5.20 | 8.89 | 8.83 |
| Observations | 111 | 94 | 91 | 111 | 94 | 91 |

Table 6: Reduced forms for grievances and mobilization

| Dependent variable | GDP per capita | | Repression | | |
|---|---|---|---|---|---|
| Corresponding col. in Tab. 5 | (3) | (4) | (2) | (3) | (4) |
| **Instruments** | | | | | |
| Democracy | | | −0.02 (0.04) | −0.01 (0.05) | −0.01 (0.05) |
| Past Repression Success | | | 0.29 (0.19) | 0.24 (0.27) | 0.06 (0.27) |
| Settler mortality | −0.31 (0.07) | −0.32 (0.07) | | | |
| Democracy in 1900 | 0.13 (0.07) | 0.12 (0.07) | | | |
| Constr. on executive in 1900 | −0.35 (0.08) | −0.35 (0.08) | | | |
| Prop. of white settlers in 1900 | 0.03 (0.01) | 0.03 (0.01) | | | |
| Log of population density in 1500 | −0.20 (0.05) | −0.20 (0.05) | | | |
| **Exogenous controls** | | | | | |
| Democratic Power | 0.03 (0.01) | 0.03 (0.01) | 0.01 (0.01) | 0.01 (0.02) | 0.01 (0.02) |
| International Rebellion | −0.08 (0.05) | −0.10 (0.05) | −0.17 (0.11) | −0.30 (0.17) | −0.24 (0.17) |
| Group Coherence | −0.05 (0.05) | −0.05 (0.05) | 0.20 (0.14) | 0.17 (0.17) | 0.17 (0.17) |
| Past Repression | −0.07 (0.03) | −0.06 (0.03) | −0.12 (0.10) | −0.08 (0.12) | −0.06 (0.12) |
| Political Discrimination | −0.08 (0.05) | −0.05 (0.05) | −0.12 (0.15) | −0.12 (0.18) | −0.14 (0.18) |
| Economic Discrimination | 0.05 (0.05) | 0.02 (0.06) | −0.12 (0.15) | −0.19 (0.18) | −0.12 (0.19) |
| Demographic Distress | −0.01 (0.02) | −0.01 (0.01) | 0.10 (0.04) | 0.13 (0.05) | 0.13 (0.05) |
| Lost Autonomy | 0.02 (0.08) | 0.01 (0.07) | 0.31 (0.20) | 0.43 (0.25) | 0.46 (0.25) |
| Past Repression Success | 0.09 (0.08) | 0.13 (0.08) | | | |
| Democracy | −0.05 (0.01) | −0.05 (0.01) | | | |
| Ethnolinguistic Fragmentation | −0.02 (0.01) | −0.02 (0.01) | | 0.01 (0.01) | 0.01 (0.01) |
| Settler mortality | | | | 0.07 (0.25) | 0.09 (0.24) |
| Democracy in 1900 | | | | −0.16 (0.23) | −0.12 (0.22) |
| Constr. on executive in 1900 | | | | 0.16 (0.26) | 0.11 (0.26) |
| Prop. of white settlers in 1900 | | | | 0.01 (0.02) | 0.01 (0.02) |
| Log of population density in 1500 | | | | 0.17 (0.18) | 0.21 (0.18) |
| $R^2$ | 0.84 | 0.85 | 0.14 | 0.17 | 0.18 |
| $F$-statistic | 25.10 | 26.69 | 1.57 | 1.01 | 1.01 |
| "Partialled out" reduced form | | | | | |
| $R^2$ | 0.61 | 0.62 | 0.02 | 0.01 | 0.00 |
| $F$-statistic | 27.68 | 28.07 | 1.40 | 0.51 | 0.08 |
| Observations | 94 | 91 | 111 | 94 | 91 |

Table 7: Reduced forms for bureaucratic quality and GDP per capita

| Dependent variable | Mobilization | | | |
|---|---|---|---|---|
| Estimator | OLS | 2SLS | | |
| | (1) | (2) | (3) | (4) |
| *Endogeneous* | | | | |
| Grievances | 0.17 (0.04) | 0.34 (0.06) | 0.47 (0.11) | 0.48 (0.11) |
| Repression | −0.05 (0.08) | −0.15 (0.50) | −0.94 (0.60) | −0.77 (0.58) |
| Log of GDP per capita | | | −0.17 (0.28) | −0.55 (0.27) |
| Bureaucratic Quality | | | | 0.70 (0.37) |
| Exogenous controls | | | | |
| Group coherence | 0.21 (0.15) | 0.28 (0.19) | 0.52 (0.22) | 0.42 (0.26) |
| Ethnolinguistic Fragmentation | | | 0.01 (0.01) | 0.00 (0.01) |
| $R^2$ | 0.13 | | | |
| $F$-statistic | 6.68 | 10.47 | 5.95 | 4.25 |
| Hansen $p$−value | | 0.27 | 0.38 | 0.19 |
| Observations | 120 | 111 | 94 | 91 |

Table 8: Mobilization equation: OLS and 2SLS estimates

| Dependent variable | Grievances | | |
|---|---|---|---|
| Estimator | OLS | 2SLS | |
| | (1) | (2) | (3) |
| *Endogenous* | | | Log GDP per capita |
| Log of GDP per capita | | 0.61 (0.58) | 0.30 (0.92) |
| Bureaucratic Quality | | | 0.76 (1.01) |
| *Exogenous controls* | | | |
| Political Discrimination | −0.29 (0.30) | −0.29 (0.36) | −0.43 (0.40) |
| Economic Discrimination | 0.86 (0.32) | 0.48 (0.42) | 0.43 (0.50) |
| Lost Autonomy | 0.68 (0.42) | 0.72 (0.37) | 0.77 (0.40) |
| Demographic Distress | 0.33 (0.10) | 0.36 (0.11) | 0.40 (0.11) |
| Past Repression | 0.36 (0.19) | 0.36 (0.18) | 0.40 (0.27) |
| Ethnolinguistic Fragmentation | | 0.01 (0.02) | 0.01 (0.02) |
| $R^2$ | 0.27 | | |
| $F$-statistic | 8.46 | 3.14 | 3.13 |
| Hansen $p$−value | | 0.03 | 0.01 |
| Observations | 120 | 94 | 91 |

Table 9: Grievances equation: OLS and 2SLS estimates

| Dependent variable | Type (Continuous) | Type (Binary) | Mobilization ×Type | Type (Continuous) | Type (Binary) | Mobilization ×Type |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Endogenous* | | | | | | |
| Grievances | −0.01 (0.04) | 0.00 (0.03) | 0.61 (0.20) | 0.00 (0.03) | 0.00 (0.02) | 0.63 (0.17) |
| Repression | 0.22 (0.15) | 0.01 (0.67) | 0.22 (0.15) | 0.18 (0.16) | 0.08 (0.08) | −0.23 (0.67) |
| Log of GDP per capita | −0.18 (0.13) | −1.28 (0.55) | −0.18 (0.13) | −0.28 (0.08) | −0.21 (0.05) | −1.57 (0.47) |
| Bureaucratic Quality | −0.05 (0.12) | −0.01 (0.07) | 0.68 (0.55) | 0.00 (0.11) | 0.01 (0.07) | 0.83 (0.47) |
| *Exogenous* | | | | | | |
| Group Coherence | 0.00 (0.11) | −0.04 (0.07) | 0.26 (0.52) | −0.01 (0.13) | −0.04 (0.07) | 0.20 (0.56) |
| Ethnolinguistic Fragmentation | 0.00 (0.11) | 0.00 (0.01) | 0.01 (0.02) | | | |
| $F$-statistic | 4.95 | 4.21 | 9.04 | 5.33 | 4.84 | 10.14 |
| Hansen $p$−value | 0.21 | 0.09 | 0.23 | 0.15 | 0.21 | 0.37 |
| Observations | 63 | 63 | 63 | 66 | 66 | 66 |

Table 10: Institutions and type of mobilization: 2SLS estimates