

# The Tocqueville Paradox: When Does Reform Provoke Rebellion?\*

Evgeny Finkel  
George Washington University

Scott Gehlbach  
University of Wisconsin–Madison

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## Abstract

We analyze a model of reform and rebellion to explore Alexis de Tocqueville’s conjecture that reform provokes political unrest. Our theory emphasizes the role of reform in determining expressive motivations to rebel through two forms of reference dependence: reform reduces grievances to the extent that its implementation improves on the status quo, but it also raises expectations that contribute to grievances when reform is implemented by local agents with a stake in the status quo. When reform is predominantly locally implemented and state capacity is weak, a more ambitious reform leads to greater concessions by local elites; nonetheless, the equilibrium probability of rebellion also increases. This tradeoff is robust to assuming that citizens are motivated by instrumental as well as expressive concerns and to the presence of strategic complementarities across localities. We illustrate our results with a discussion of Russia’s Emancipation Reform of 1861.

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The regime that a revolution destroys is almost always better than the one that immediately preceded it, and experience teaches that the most dangerous time for a bad government is usually when it begins to reform

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Alexis de Tocqueville ([1856] 2011, p. 157)

Contemporary models of political economy posit an intuitive relationship between reform and rebellion. By transferring utility to some excluded group, reform raises the opportunity cost of rebellion, thus reducing the probability of unrest. This logic drives numerous models of regime change and autocratic stability (e.g., Boix, 2003; Acemoglu and Robinson, 2006; Gandhi and Przeworski, 2006; Dunning, 2008; Ansell and Samuels, 2010; Svobik, 2012; Miller, 2013), reflecting the reality in authoritarian states that rebellion is often the only recourse to bad government.

This view of the relationship between reform and rebellion is entirely at odds with that famously articulated by Alexis de Tocqueville. As captured in the epigraph to this paper, Tocqueville argued that reforming governments were often at greatest risk of revolution. Tocqueville's argument is multifaceted, but at its core it emphasizes the role of reform in raising expectations that cannot be satisfied. This perspective finds echoes in important work on reform and rebellion that predates the models cited above. Key contributions include Davies' (1962) famous "J-curve" theory of revolution, in which a period of wealth and advancement is followed by backsliding and worsening of conditions, eventually leading to revolution; Gurr's (1970) theory of relative deprivation, in which expectations of improvement are juxtaposed with a much harsher reality, leading "men" to rebel; and Huntington's (1968) observation that reform may be a "catalyst" rather than "substitute" for social instability.

Tocqueville's argument that unfulfilled expectations produce unrest is intuitive, but why cannot the expectations raised by reform be fulfilled? One possibility is that reform, once announced—and expectations raised—can still be blocked by actors with a stake in the status quo. Expressing this view, Oberschall (1995, pp. 155–157) suggests that "Tocqueville's

paradox” is in fact hardly surprising, as “reform attempts tend to be half-hearted and ineffective because of institutional weakness and deliberate efforts by certain groups to undermine them.” The actual outcome is “erratic reformism,” exacerbating rather than quieting discontent.<sup>1</sup>

This perspective, in turn, raises further questions. To what extent do the “certain groups” in a position to block implementation of reform internalize the resulting rebellion? Is there always a tradeoff between stability and reform, or is it possible to pursue the latter without risking the former? What role, if any, does state capacity play in mediating the relationship between reform and rebellion?

We address these questions with a formal theory of reform and rebellion. Our modeling approach incorporates three key assumptions. First, we assume that some part of reform, modeled simply as the reallocation of a divisible resource, must be **implemented** by a strategic agent—a local elite, in our formalization—with a stake in the status quo. Even autocratic rulers cannot rule by fiat alone, but instead must rely upon formal or informal agents to carry out bureaucratically demanding tasks. Those agents with sufficient expertise to implement reform, in turn, are often those with the most to lose from the process. An instructive case, which we discuss at length below, is Russia’s emancipation of the serfs in 1861: implementation of this reform was substantially delegated to the local nobility that possessed the land on which serfs resided.<sup>2</sup> More recently, the critical tasks of corporatization and initial share allocation that accompanied enterprise privatization in postcommunist Russia were organized by managers and employees of the firms to be privatized (Boycko, Shleifer and Vishny, 1995; Frydman, Rapaczynski and Earle, 1993).

Our second key assumption is that rebellion is driven, at least in part, by **expressive mo-**

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<sup>1</sup>An alternative but complementary interpretation of the Tocqueville paradox is that reform creates an opening for collective action; see Tarrow (1989, 2011).

<sup>2</sup>More generally, land reform often provides opportunities for obstruction by local elites; see Albertus (2015).

**tivations**, although we also allow for instrumental concerns. This assumption is grounded in a long literature in various disciplines that emphasizes the role of expressive concerns in rebellion (e.g., Scott, 1976; Wood, 2003).<sup>3</sup> The idea that both expressive and instrumental motivations may be important in the decision to rebel arguably dates to Gurr (1970), with recent work in social psychology (van Zomeren et al., 2004; van Zomeren, Leach and Spears, 2012) and political science (Humphreys and Weinstein, 2008) suggesting a sometimes subtle interaction between these two “pathways” to mobilization. Our model builds especially on Passarelli and Tabellini’s (2017) formalization of the role of “emotions” in political unrest—with some key differences, as we discuss below.

Third, we assume that reform determines expressive motivations to rebel through two related forms of “**reference dependence**”—that is, the tendency of individuals to “normally perceive outcomes as gains and losses, rather than as final states of wealth or welfare,” where “gains and losses... are defined relative to some neutral reference point” (Kahneman and Tversky 1979, 274; see also Tversky and Kahneman 1991). A substantial literature demonstrates the importance of such perceptions across a range of field and laboratory environments (for reviews, see Camerer, Loewenstein and Rabin 2004 and DellaVigna 2009), though there is little consensus on the empirical nature of reference points outside of controlled settings (Koszegi and Rabin, 2006). Formal models of political behavior have considered a variety of reference points, including the status quo (Alesina and Passarelli, 2015; Lockwood and Rockey, 2015), rational expectations of future payoffs (Grillo, 2016; Acharya and Grillo, 2017), and aspirations established by parents (Besley, 2016).

In our setting, two reference points are focal: the status quo of no reform and the promise

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<sup>3</sup>Chong (2014, ch. 4) refers to expressive behavior as noninstrumental but “narrowly rational,” which accords with our assumption that such concerns enter the cost-benefit calculation in the decision to rebel. Blattman and Miguel (2010) suggest that the weak statistical evidence for such motivations in some studies may be a consequence of the crude proxies employed, and they call for the development of better measures of grievances.

of reform itself. We assume that citizens evaluate central and local implementation of reform relative to both of these reference points. Improvements on the status quo are perceived as gains, whereas failures to fully implement reform are experienced as losses; we parameterize the relative importance of these two evaluations.<sup>4</sup> Intuitively, we can think of citizens as “endowed” by the promise of reform with a share of the contested resource (Thaler, 1980; Knetsch, 1989; Kahneman, Knetsch and Thaler, 1990). The failure of elites to fulfill that promise is experienced as a loss of the endowment, though that sensation may be partially offset by gains (through the partial implementation of reform) over the status quo.<sup>5</sup>

Our key results relate to the extent to which reform is locally (rather than centrally) implemented, relative to the weight that citizens place on gains over the status quo (versus losses from incomplete implementation). When reform is predominantly locally implemented, then a more ambitious reform always leads to greater implementation by local elites; at the same time, the equilibrium probability of rebellion also increases. Our model thus suggests a tradeoff between stability and reform, such that unrest is the price of local implementation.

These sharp results are robust to varying assumptions about citizens’ motivations in

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<sup>4</sup>Our formulation of dual reference points is consistent with the “reference lotteries” in Koszegi and Rabin (2006) if one interprets the status quo and promise of reform as potential outcomes, though our analysis does not invoke that paper’s “extreme” (p. 1135) assumption that expectations under this lottery are determined by equilibrium strategies. Alternatively, one can understand expressive motivations to rebel as incorporating both backward-looking and forward-looking evaluations, much as voters may combine “retrospective” and “prospective” assessments.

<sup>5</sup>The assumption that citizens are more likely to rebel when implementation falls short of the promise of reform can also be motivated by the observation that individuals are willing to take costly actions to punish those who hurt them (Rabin, 1993) and by evidence that collective action is more likely when citizens are able to trace blame to specific, identifiable actors (Javeline, 2003*a,b*)—in our context, the elites responsible for reform’s local implementation.

choosing to rebel. In particular, we show that the same qualitative relationship between reform and rebellion holds if, in addition to the expressive concerns described above, citizens are instrumentally motivated to rebel to seize control of the local resource. We also obtain identical qualitative results if we assume that the expressive benefit from rebelling is increasing in the number of other localities that rebel—that is, that there are strategic complementarities across bargaining units.

Our analysis reveals an implicit assumption of the political-economy models discussed above: the presence of a state with sufficient capacity to administer reform without raising expectations that cannot be met. This capacity may allow for central implementation of reform, which implies greater aggregate (central and local) implementation *and* lower risk of rebellion. Alternatively, capacious states may be able to ensure that local elites implement reform as intended, which we demonstrate can also reduce rebellion.

Beyond the particular focus on reform and rebellion, a key contribution of our work is to develop a theory of contentious politics that draws on the “prospect theory” of Kahneman and Tversky (1979). As originally formulated, prospect theory posits three now-familiar departures from standard utility theory: reference dependence, loss aversion, and diminishing sensitivity (where the first and third assumptions together imply risk aversion in the realm of gains and risk acceptance in the realm of losses). Our theory employs the first, and arguably second, of these assumptions.<sup>6</sup> (Thus, we do not need risk preferences to explain the “risky” behavior of rebellion.) Although increasingly common in neighboring disciplines,<sup>7</sup> applications of prospect theory are relatively unusual in political science outside the field of international relations,<sup>8</sup> and they are rare in the study of contentious politics and political

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<sup>6</sup>As discussed above, reform provokes rebellion when citizens place a relatively small weight on gains over the status quo—that is, when they more keenly experience the loss associated with unfulfilled expectations.

<sup>7</sup>For a review and application to cost-benefit analysis, see Weimer (2017).

<sup>8</sup>Levy (2003), McDermott (2004), and Mercer (2005) provide early reviews; see also the

violence (but see Fanis, 2004; Tezcür, 2016).

One recent paper does formally explore collective action in the context of reference dependence: Passarelli and Tabellini (2017), which models the relationship between “emotions” (analogous to expressive motivations in our setting) and political unrest. Our work shares some similarities and differences with that paper. As in Passarelli and Tabellini, we model psychological grievances as an important determinant of rebellion, though our focus on the decentralized implementation of reform is novel. Moreover, as in that paper, we establish equilibrium uniqueness in the presence of strategic complementarities (here, when the incentive to rebel in any locality depends on the level of unrest elsewhere) directly through preference heterogeneity, not—as in the extensive literature on “global games”—differential information (and thus preference heterogeneity). Our approach differs from Passarelli and Tabellini in the specific reference points that determine psychological gains and losses—here, the status quo of no reform and the promise of reform itself; in Passarelli and Tabellini, the solution to a biased social-welfare maximization problem.

Our work also connects to a burgeoning literature in political economy on the causes and consequences of state capacity (e.g., Besley and Persson, 2010). Within political science, a distinction is sometimes drawn between the capacity of principals and agents (e.g., legislatures and bureaucracies, respectively; see the discussion in Gehlbach, 2013, ch. 5). Our approach is closest to the former tradition: we ask how the relationship between reform and rebellion depends on the capacity of an (unmodeled) central government to implement reform on its own. Our finding that reform provokes rebellion only when such capacity is weak relates to work by Bertrand (2013) and Haggard and Kaufman (1992, 1995), who argue that strong state institutions reduce the likelihood of pressure from below in the wake of reform.<sup>9</sup>

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various cites above.

<sup>9</sup>Numerous models consider mechanisms by which autocrats might reduce the risk of rebellion without explicitly tying unrest to reform; see Gehlbach, Sonin and Svulik (2016).

Not least, we build on a large literature on the relationship between reform and rebellion, some of which is cited above. A related body of work (Acemoglu, Egorov and Sonin, 2016; Healy, Kosec and Mo, 2017) considers Tocqueville’s varying conjectures about the relationship between social mobility (i.e., the possibility of moving up or down the income distribution) and social stability (de Tocqueville, [1835/40] 2002, [1856] 2011). Our model largely abstracts from such considerations, treating the elite and citizenry within any locality as unitary actors.

The paper proceeds as follows. In the next section, we present a model of reform and rebellion. After establishing baseline results, we discuss implications of our analysis for the optimal design of reform. We then examine robustness to the presence of instrumental motivations and spillovers across localities. In the penultimate section, we illustrate our theoretical perspective with an extensive discussion of Russia’s Emancipation Reform of 1861. We close with concluding thoughts.

## 1 Baseline model and analysis

### 1.1 Environment

To build intuition, we analyze a bargaining game featuring an *elite* and a *citizenry*, where the citizenry is motivated only by expressive concerns. It is useful to think of the elite and citizenry as local actors within a larger polity. We ignore for now the role of coordination across localities, focusing instead on strategic interaction between the citizenry and the elite *within* any particular locality. As we show in Appendix A, we can rationalize our treatment of the citizenry as a unitary actor with a simple model of collective action among citizens of that locality.

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For a model of reform and rebellion in which “capacity” takes the form of resolve, see Pond and Carroll (2016).



We are interested in the response of the citizenry to reform  $\gamma \in (0, 1]$ , where the parameter  $\gamma$  denotes the proportion of an infinitely divisible resource to be transferred from the elite to the citizenry. We do not provide a model of the process by which  $\gamma$  is chosen, though our analysis implies a number of lessons for reform design, which we discuss below. Implicitly, we model the subgame (subform, when considering multiple localities) that follows the unmodeled choice of  $\gamma$  by a central government.<sup>10</sup>

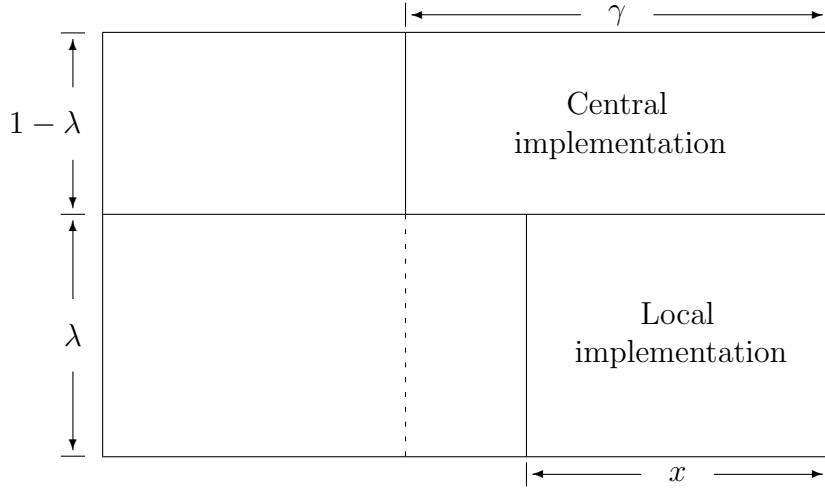
The implementation of reform depends in part on the actions of the local elite. In particular, we assume exogenous proportion  $\lambda \in (0, 1)$  of the resource to be under control of the elite, which announces a *local implementation* of reform  $x \in [0, \gamma]$ . In contrast, proportion  $(1 - \lambda)\gamma$  is transferred automatically to the citizenry—for example, because an unmodeled central government has sufficient capacity to force that decision on the elite, an intuition to which we return further below. We refer to this latter, automatic transfer as *central implementation*. Many of our key results relate to the degree to which reform is locally implemented, as captured by  $\lambda$ . Figure 1 provides a graphical illustration of this process.

Following implementation of reform, the citizenry in each locality decides whether to rebel. In the baseline model examined here, the motivation to rebel is based entirely on expressive concerns—not on any anticipated material gains from rebellion. Peering behind the veil of a unitary citizenry, one can rationalize this assumption by assuming that the material gains from rebellion are non-excludable, whereas the “warm glow” from rebellion is experienced if and only if a citizen participates in rebellion. Further below we examine the robustness of our results to assuming that the citizenry values the contested resource directly.

In particular, we assume that the citizenry is more inclined to rebel, the larger its dis-

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<sup>10</sup>In a related context, Gerber, Lupia and McCubbins (2004) analyze the implementation game (involving a legislature and bureaucracy) that follows an exogenous “reform” (citizen initiative).



**Figure 1:** The policy environment. Proportion  $\lambda$  of an infinitely divisible resource is under control of the local elite, whereas proportion  $1 - \lambda$  is under “central control.” The elite chooses how much ( $x$ ) of reform  $\gamma$  to locally implement; central control implies full implementation of  $\gamma$ .

satisfaction with the implementation of reform. Formally, the citizenry compares the payoff from not rebelling, which we normalize to zero, to the expected payoff from rebelling, which we define as

$$\Gamma(x) - \eta - \epsilon \tag{1}$$

where  $\Gamma(x)$  denotes the citizenry’s *grievance*, which is a function of the endogenous local implementation of reform  $x$ . The parameter  $\eta$  measures an exogenous (material, psychological, etc.) cost of rebellion to the citizenry, whereas the random variable  $\epsilon$  represents a cost of rebellion that is realized only after the elite chooses  $x$ .

A key assumption of the model is that the citizenry’s grievance is determined by the degree to which both local and central implementation of reform improve upon, or fall short of, two focal reference points: the status quo of no reform, which we denote  $\hat{\gamma}$ , and the promise of reform itself ( $\gamma$ ), where weight  $\beta$  is given to the former comparison and weight  $1 - \beta$  to the latter. Formally, the citizenry’s grievance is

$$\Gamma(x) = \underbrace{\lambda [-\beta (x - \hat{\gamma}) + (1 - \beta) (\gamma - x)]}_{\text{Local implementation}} + \overbrace{(1 - \lambda) [-\beta (\gamma - \hat{\gamma}) + (1 - \beta) (\gamma - \gamma)]}^{\text{Central implementation}}.$$

The first term on the right-hand side of this equation incorporates the psychological gain (improvement on the status quo  $\hat{\gamma}$ ) and loss (failure to achieve the promise  $\gamma$  of reform), respectively, that the citizenry experiences from local implementation of reform  $x$ . (Gains imply a reduction in grievances, whereas losses imply an increase.) The second term, in turn, incorporates the gain and loss that the citizenry experiences from the (assumed complete) central implementation of reform. Simplifying gives

$$\Gamma(x) = \lambda(\gamma - x) - \beta(\gamma - \hat{\gamma}). \quad (2)$$

The citizenry's grievance is thus a weighted difference of a) the degree to which local implementation falls short of the promise of reform and b) the promise of reform improves on the status quo, where the weights on the two terms correspond to the degree of local implementation ( $\lambda$ ) and the relative importance of the status quo in the citizenry's evaluation of gains and losses from reform ( $\beta$ ).

Returning to the cost of rebellion for the citizenry, we assume that  $\epsilon$  is drawn from the distribution  $F$ , where  $F$  is twice differentiable, with density  $f$ , and strictly increasing on an interval sufficiently wide to ensure that there are realizations of  $\epsilon$  such that the citizenry would choose to rebel and not rebel, respectively, for all  $x \in [0, \gamma]$ .

**Assumption 1.**  $F(-\beta(\gamma - \hat{\gamma}) - \eta) > 0$ .

**Assumption 2.**  $F(\lambda\gamma - \beta(\gamma - \hat{\gamma}) - \eta) < 1$ .

Many of our key results further exploit the assumption that the hazard rate  $H(z) \equiv \frac{f(z)}{1-F(z)}$  is strictly increasing, which is satisfied for a wide class of distributions, including the uniform and normal.

Rebellion is costly to the elite. We assume that, in the event of a rebellion, the elite loses proportion  $p \in (0, \gamma)$  of the resource under local control. (We can interpret the parameter  $p$  as the probability that the citizenry gains control of the local resource, which for reasons discussed above does not enter the calculus to rebel. Alternatively,  $p$  may represent the

destruction of some proportion of the local resource in the event of rebellion.) In contrast, if no rebellion is attempted, the elite transfers  $\lambda x$  to the local citizenry. Finally, as previously assumed, regardless of whether the citizenry rebels, the elite transfers the exogenously mandated share  $(1 - \lambda)\gamma$ . The elite's preferences are represented by its expected share of the contested resource,

$$\begin{aligned} & \Pr(\text{rebellion} \mid x) [\lambda(1 - p) + (1 - \lambda)(1 - \gamma)] \\ & + [1 - \Pr(\text{rebellion} \mid x)] [\lambda(1 - x) + (1 - \lambda)(1 - \gamma)], \end{aligned}$$

which can be equivalently represented as

$$-x + \Pr(\text{rebellion} \mid x)(x - p). \quad (3)$$

Summarizing, the game proceeds as follows: The elite chooses a level of local implementation  $x \in [0, \gamma]$  to maximize Expression 3, following which the citizenry decides to rebel, given Expression 1 and Equation 2.

## 1.2 Analysis

Equations 1 and 2 imply that the probability that the citizenry in locality  $i$  rebels is  $F(z)$ , where

$$z \equiv \lambda(\gamma - x) - \beta(\gamma - \hat{\gamma}) - \eta. \quad (4)$$

Rebellion is less likely, the closer is local implementation  $x$  to reform  $\gamma$ . The local elite anticipates this relationship in solving

$$\max_x -x + F(z(x))(x - p), \quad (5)$$

where we make explicit the dependence of  $z$  on  $x$ . Taking the first-order condition and rearranging gives the optimal local implementation of reform  $x^*$ .

**Proposition 1.** *Assume that Assumptions 1 and 2 are satisfied. If the hazard rate  $H$  is strictly increasing, the optimal local implementation of reform  $x^*$  is given implicitly by*

$$x^* = \max \left[ p - \frac{1}{\lambda} \cdot \frac{1 - F(z(x^*))}{f(z(x^*))}, 0 \right]. \quad (6)$$

*Proof.* Equation 6 follows directly from Problem 5. The assumption of a strictly increasing hazard rate ensures that the second-order condition is satisfied for an interior solution: see Appendix B.  $\square$

The next proposition uses this result to establish the relationship between local implementation and reform  $\gamma$ .

**Proposition 2.** *Assume that Assumptions 1 and 2 are satisfied. If the hazard rate  $H$  is strictly increasing and  $x^* > 0$ , a marginal increase in reform  $\gamma$  increases (decreases) local reform implementation if and only if  $\lambda$  is greater (less) than  $\beta$ .*

*Proof.* Differentiating Equation 6 implicitly with respect to  $\gamma$  for the case  $x^* > 0$  gives

$$\frac{\partial x^*}{\partial \gamma} = \frac{1}{\lambda} \cdot \frac{H'(z(x^*))}{[H(z(x^*))]^2} \left( \lambda - \lambda \frac{\partial x^*}{\partial \gamma} - \beta \right), \quad (7)$$

where  $H'$  is the derivative of  $H$ . Rearranging gives

$$\frac{\partial x^*}{\partial \gamma} = \left[ 1 + \frac{H'(z(x^*))}{[H(z(x^*))]^2} \right]^{-1} \frac{H'(z(x^*))}{[H(z(x^*))]^2} \cdot \frac{\lambda - \beta}{\lambda}. \quad (8)$$

As  $H'(z(x^*)) > 0$  by assumption of a strictly increasing hazard rate,  $\frac{\partial x^*}{\partial \gamma} \geq 0$  if and only if  $\lambda \geq \beta$ .  $\square$

When reform is predominantly locally implemented, implying that citizens' expressive motivations—and hence willingness to rebel—are driven by the degree to which local elites fail to deliver on the promise of reform, those elites unsurprisingly respond to an ambitious reform by surrendering more of the contested resource. Nonetheless, as the following proposition establishes, it is in precisely this situation that rebellion is more likely, the more ambitious is reform.

**Proposition 3.** *Assume that Assumptions 1 and 2 are satisfied. If the hazard rate  $H$  is strictly increasing, the equilibrium probability of rebellion is increasing (decreasing) in reform  $\gamma$  if and only if  $\lambda$  is greater (less) than  $\beta$ .*

*Proof.* For  $x^* = 0$ , the statement follows directly from Equation 4 and the assumption that  $F$  is strictly increasing. Now assume  $x^* > 0$ . Differentiating the probability of rebellion with respect to  $\gamma$  gives

$$\frac{\partial F(z(x^*))}{\partial \gamma} = f(z(x^*)) \left( \lambda - \lambda \frac{\partial x^*}{\partial \gamma} - \beta \right) \quad (9)$$

Using Equation 7 to substitute for the expression in parentheses, we can rewrite the previous equation as

$$\frac{\partial F(z(x^*))}{\partial \gamma} = f(z(x^*)) \frac{\partial x^*}{\partial \gamma} \lambda \frac{[H(z(x^*))]^2}{H'(z(x^*))}.$$

As  $H'(z(x^*)) > 0$  by assumption of a strictly increasing hazard rate,  $\frac{\partial F(z(x^*))}{\partial \gamma} \geq 0$  if and only if  $\frac{\partial x^*}{\partial \gamma} \geq 0$ , and thus (by Proposition 2), if and only if  $\lambda \geq \beta$ .  $\square$

Whether or not local elites choose to actually carry out reform, the equilibrium probability of rebellion is increasing in reform  $\gamma$  if  $\lambda > \beta$  and is decreasing in  $\gamma$  if  $\lambda < \beta$ . We can interpret this result as follows. Local implementation of reform drives a wedge between citizens' expectations of what reform promises and what actually happens. Elites attempt to minimize this wedge, and thus the risk of rebellion, by carrying out some of what reform demands, but they discount the grievances arising from under-implementation. At the same time, the citizenry "gives credit" (where the parameter  $\beta$  measures the degree of credit) for reforms that improve on the status quo—this reduces grievances and the propensity to rebel. The former effect dominates the latter when reform is predominantly locally implemented.

The following derivation may be useful. Observe from Equation 9 that for  $x^* > 0$ , the relationship between the equilibrium probability of rebellion and reform  $\gamma$  is proportional to

$$(\lambda - \beta) - \lambda \frac{\partial x^*}{\partial \gamma}. \quad (10)$$

The first term in this expression represents the direct effect of  $\gamma$  on rebellion, holding constant local implementation  $x^*$ , whereas the second term is the indirect effect through  $x^*$ , scaled by the degree to which reform is locally implemented. By Equation 8, we can express  $\frac{\partial x^*}{\partial \gamma}$  as

$$\alpha(x^*) \cdot \frac{\lambda - \beta}{\lambda}, \quad (11)$$

where

$$\alpha(x^*) \equiv \left[ 1 + \frac{H'(z(x^*))}{[H(z(x^*))]^2} \right]^{-1} \frac{H'(z(x^*))}{[H(z(x^*))]^2} \quad (12)$$

is a fraction bounded by zero and one. (When  $F$  is uniform,  $\alpha = \frac{1}{2}$ .) Substituting Equation 11 into Expression 10 gives

$$[1 - \alpha(x^*)](\lambda - \beta),$$

The relationship between rebellion and reform is thus proportional to the direct effect of reform on rebellion  $(\lambda - \beta)$ , holding local implementation constant, with a discount that depends on the curvature of the hazard rate  $H$ . In particular, the greater the (roughly) relative rate of change in the hazard rate in a neighborhood of  $x^*$ , the more responsive is local implementation to grievances, and thus the smaller is the relationship between rebellion and reform.

In essence, when the contested resource is predominantly under local control, reform generates a race between expectations and implementation. The latter chases the former, given the elite's desire to prevent rebellion, but never catches up. The result is a heightened chance of rebellion.

## 2 Implications for reform design

Imagine a reformist but skittish central government interested in effecting the transfer of some contested resource from local elites to the citizenry but concerned about accompanying unrest. What is the optimal reform design?

On the one hand, taking as given the degree  $\lambda$  to which reform must be locally implemented, local elites surrender more of the resource when reform is more ambitious. To see this, observe that aggregate (local and central) reform implementation is

$$\lambda x^* + (1 - \lambda)\gamma,$$

where  $x^*$  is equilibrium local implementation. Differentiating with respect to  $\gamma$  gives

$$\lambda \frac{\partial x^*}{\partial \gamma} + (1 - \lambda), \quad (13)$$

which is clearly positive if  $x^* = 0$ . Focus, then, on the case  $x^* > 0$ . Recalling that, for this case,  $\frac{\partial x^*}{\partial \gamma} = \alpha(x^*) \cdot \frac{\lambda - \beta}{\lambda}$ , where  $\alpha(x^*)$  is defined by Equation 12, we can rewrite Expression 13 as

$$\alpha(x^*)(\lambda - \beta) + (1 - \lambda),$$

which is clearly positive for  $\lambda \geq \beta$ . For the residual case in which  $x^* > 0$  but  $\lambda < \beta$ , observe that

$$\frac{1 - \lambda}{\beta - \lambda} > 1 > \alpha(x^*),$$

given that  $\alpha(x^*)$  is bounded by zero and one.

On the other hand, when reform is predominantly locally implemented (i.e., when  $\lambda > \beta$ ), a more ambitious reform implies more rebellion, as implied by Proposition 3. In principle, the central government can attempt to minimize this tradeoff by taking on more of the task of implementing reform itself. In practice, this may be costly or even impossible, depending on the nature of reform and the capacity of the state. Indeed, the key advantage of local implementation is that the burden of implementing reform can be pushed onto other actors—but as implied by Proposition 2, this works only if  $\lambda > \beta$ , which is precisely when reform carries the risk of rebellion.

In some environments, it may be possible to eliminate this tradeoff by monitoring local elites to ensure that they implement reform as intended. To model this in a simple manner, assume that the elite in locality  $i$  bears a cost  $\kappa(\gamma - x)$  if  $x < \gamma$ , where the parameter  $\kappa > 0$  measures the capacity of central state officials to observe and subsequently impose punishment on local elites for not fully implementing reform. With this modification, the elite's problem becomes

$$\max_x - (1 - \kappa)x + \Pr(\text{rebellion} \mid x)(x - p).$$



Clearly, for  $\kappa$  sufficiently large,  $x^* = \gamma$ : the elite maximally implements reform. When this is the case, rebellion is unambiguously decreasing in reform. Intuitively, when local elites fully implement reform, citizens' only grievance is that centrally implemented reform could have been more ambitious. The larger is  $\gamma$ —the greater the improvement on the status quo—the smaller is this grievance. To see this formally, observe that when  $x = \gamma$ , Equation 4 gives the probability of rebellion as

$$F(-\beta(\gamma - \hat{\gamma}) - \eta),$$

which is decreasing in  $\gamma$ .

Nonetheless, as we illustrate below in our discussion of Russian emancipation, the same limits to state capacity that discourage central implementation may prevent the central government from holding local elites accountable. Weak states are often weak in every respect.

Summarizing, if reform can be predominantly centrally implemented—if  $\lambda$  can be set below  $\beta$ —at little or no cost, then the optimal reform design is to set  $\gamma = 1$ : maximal reform results in maximal implementation and minimal rebellion. Similarly, if reform must be locally implemented but local elites can be held accountable for implementation, then  $\gamma = 1$  is again optimal. But if reform must be locally implemented and local elites cannot be held to account, then the optimal reform design may set  $\gamma < 1$ , as the central government's interest in reform implementation is balanced against its fear of rebellion.

### 3 Robustness

In this section, we briefly discuss robustness of the results above to two alternative formulations. We provide full details in the online appendix.

### 3.1 Instrumental motivations

In the model above, we assume that the citizenry is motivated by expressive concerns only. Although this reasonably captures an environment in which material gains from rebellion are non-excludable, it is straightforward to incorporate instrumental motivations. To do so, we assume that rebellion is successful with probability  $p \in (0, \gamma)$ . In the event of a successful rebellion, the elite transfers the entire resource under local control, valued at  $\lambda$ , to the citizens of that locality. If an attempted rebellion is unsuccessful (which occurs with probability  $1 - p$ ), the elite keeps the entire resource under local control for itself. Finally, if no rebellion is attempted, the elite transfers  $\lambda x$  to the citizenry. As before, regardless of whether rebellion is attempted or successful, the elite transfers the exogenously mandated share, valued at  $(1 - \lambda)\gamma$ .

With these assumptions, the elite's problem is the same as before. The motivation to rebel, however, is different. In particular, we assume that the citizenry compares the payoff from not rebelling, which is simply  $[\lambda x + (1 - \lambda)\gamma]$ , to the expected payoff from rebelling, which we define as

$$\underbrace{[\lambda p + (1 - \lambda)\gamma]}_{\text{Material payoff}} + \underbrace{\psi [\lambda (\gamma - x) - \beta (\gamma - \hat{\gamma})]}_{\text{Expressive payoff}} - \underbrace{(\eta + \epsilon)}_{\text{Cost of rebellion}}. \quad (14)$$

The parameter  $\psi > 0$  measures the degree to which expressive concerns are important. Then the equilibrium relationship between local implementation and reform can be expressed as

$$\frac{\partial x^*}{\partial \gamma} = \hat{\alpha}(x^*) \cdot \frac{\psi}{1 + \psi} \cdot \frac{\lambda - \beta}{\lambda},$$

where

$$\hat{\alpha}(x^*) \equiv \left[ 1 + \frac{H'(z'(x^*))}{[H(z'(x^*))]^2} \right]^{-1} \frac{H'(z'(x^*))}{[H(z'(x^*))]^2}$$

is analogous to Equation 12 and

$$z' \equiv \lambda(p - x) + \psi [\lambda (\gamma - x) - \beta (\gamma - \hat{\gamma})] - \eta.$$

Intuitively, the magnitude of the relationship between local implementation and reform depends on the relative importance of expressive concerns, as measured by  $\psi$ , as only the expressive payoff in Equation 14 depends on  $\gamma$ . This extends to the relationship between reform and rebellion, which as shown above has the same sign as the relationship between local implementation and reform. The robustness of our results thus depends on the degree to which citizens are motivated by the grievances central to our theory.

### 3.2 Interdependent rebellion

The baseline model assumes that local rebellions are isolated one from another: the incentive to rebel in any locality is unaffected by what happens elsewhere. In practice, unrest often spills over into neighboring areas, strengthening the resolve of citizens there to act upon their grievances. To explore the impact of such spillovers, we assume a continuum of localities, indexed by  $i$ . In each locality  $i$ , an elite chooses local implementation  $x_i$ , following which a citizenry chooses to rebel.

Similarly to Passarelli and Tabellini (2017), we assume that the expressive payoff from rebellion is proportional to the grievance and to the participation of citizens in other localities. In particular, let the net payoff from rebellion be

$$h\tilde{\Gamma}(x_i) - (\eta + \epsilon_i),$$

where  $h \in [0, 1]$  is the endogenous proportion of localities that rebel, and the grievance

$$\tilde{\Gamma}(x_i) \equiv \lambda(\gamma - x_i) - \beta(\gamma - \hat{\gamma}) + \xi. \tag{15}$$

We assume the parameter  $\xi \geq \beta(\gamma - \hat{\gamma})$ , which implies that the expressive payoff from rebellion is positive so long other localities also rebel (e.g., because of the “warm glow” from participating in collective action), even if  $x_i = \gamma$ . Then if there is sufficient heterogeneity in the idiosyncratic cost of rebellion  $\epsilon_i$  (an assumption analogous to “two-sided limit dominance” in the literature on global games; see Morris and Shin, 2003), for any common level of local implementation  $\bar{x} \in [0, \gamma]$  there is a unique level of rebellion  $h^*(\bar{x})$ .

We use this result to derive a symmetric equilibrium, in which the elite in any locality  $i$  chooses  $x_i = \bar{x}$ . Notwithstanding the different strategic environment, the equilibrium level of local implementation takes a form similar to that in Proposition 1:

$$\bar{x} = \max \left[ p - \frac{1}{h^*(\bar{x}) \lambda} \cdot \frac{1 - F \left( h^*(\bar{x}) \tilde{\Gamma}(\bar{x}) - \eta \right)}{f \left( h^*(\bar{x}) \tilde{\Gamma}(\bar{x}) - \eta \right)}, 0 \right].$$

From this it follows that the relationship between local implementation and reform can be expressed as

$$\frac{\partial \bar{x}}{\partial \gamma} = \tilde{\alpha}(\bar{x}) \cdot \frac{\lambda - \beta}{\lambda},$$

where  $\tilde{\alpha}(\bar{x})$  is a fraction bounded by zero and one. The relationship between reform and rebellion is proportional to the same expression. Our key comparative statics thus extend to the case in which elites and citizens take into account the interdependence of rebellion across localities.

## 4 Empirical illustration: Russia's emancipation of the serfs

In this section we illustrate the insights gained from the model by analyzing an important case of institutional reform: Russia's emancipation of the serfs in 1861. As we demonstrate, local implementation in a context of weak state capacity provoked unrest among precisely those that reform was designed to help.

### 4.1 Background

In Russia, serfdom developed differently from elsewhere in Europe. Indeed, through the fifteenth century, Russian peasants enjoyed legal freedom and the right to choose their place of residence and employment. The gradual introduction of serfdom was driven by two factors. First, state building and territorial expansion necessitated the creation of a large class of

military and civilian servitors, who were compensated for their service by land grants (e.g., Kimerling Wirtschafter, 2008). Second, however, territorial expansion into unsettled territories, coupled with peasants' freedom of movement, put the economic wellbeing of these servitors at risk (Domar, 1970). Ever-increasing restrictions on peasants' rights made state service more appealing for servitors, and these restrictions ultimately culminated in the formal introduction of serfdom in the mid-seventeenth century.

Russian serfs were legally "attached" to the land on which they lived, and the estate's aristocratic owner enjoyed almost unlimited powers over her serfs. By law, serfs were not allowed to own property, and the estate's owner enjoyed broad policing and judicial powers over the serfs, including the authority to administer various punishments. The majority of serf peasants were allotted a strip of land for cultivation and subsistence, in exchange for which they were required to perform certain obligations; the most significant of these were unpaid labor on the landlord's fields (*barshchina*, or *corvée*), payment in money or kind (*obrok*, or *quitrent*), or some combination of the two. Serfs were at constant risk of being stripped of their land, which belonged entirely to the landlord, resettled, or sold. Although in theory there were some limitations on landowners' behavior, such as the restriction of *barshchina* to no more than three days a week, such safeguards were tenuous at best, as the law prescribed corporal punishment for any complaints against an estate's owners (Zaionchkovskii, 1968).

The logic behind serfdom was the Russian state's model of universal service: serfs served and provided income for the nobles, who in turn were legally obligated to serve the state. Over time, however, the nobility's obligations under this social contract were eliminated. Empress Anna (1730–40) "allowed nobles to keep at least one son at home to run the estate" (Montefiore, 2016, p. 156), and in 1762 the service requirement for the nobility was abolished altogether. With this change, the moral justification for serfdom was also eliminated.

For Russia's rulers, serfdom presented a political as well as moral problem. As in any system of coerced labor, there were periodic spasms of violence, from the murder of individual landlords to large-scale peasant revolts that threatened the very survival of the monarchy,

including the Pugachev Rebellion (1773–1775). At the same time, any attempts to reform the institution were blocked by the nobility, on whose support the Romanov dynasty relied and for whom the existing economic order was quite profitable (Domar and Machina, 1984). Tsar Paul I (1796–1801), who attempted to limit the nobility’s power over their serfs and to introduce minimum land allotments, was murdered in a palace coup (Zenkovsky, 1961, p. 282). “Serfdom is a powder magazine under the state and the peasantry is an explosive mine,” admitted Tsar Nicholas I (1825–55), yet “to tamper with it now would be, of course, an even more disastrous evil” (Volin, 1943, p. 48). Any attempts at reform were restricted to the periphery of the Empire, such as the landless emancipation of the Baltic serfs between 1816 and 1819, or were extremely limited in scope, such as the introduction in the 1840s of “inventories” meant to regulate serfs’ obligations and land allotments in right-bank Ukraine.

The government’s attitude changed with Russia’s humiliating defeat in the Crimean War (1853–1856), which exposed the country’s backwardness and its inability to compete in the international order. The most important of the “Great Reforms” that followed was Russia’s emancipation of the serfs. In 1857, Tsar Alexander II (1855–1881) warned Moscow’s nobility that it would be better to emancipate the serfs “from above” than to allow this to happen “from below.” On December 4, 1858, Alexander publicly announced that serfdom would be abolished, regardless of the fears and desires of the noble class.

While the intent to emancipate the serfs was widely publicized, the exact content of the reform was subject to negotiations and pitched political battles at court. A large portion of the nobility viewed emancipation as an existential threat to their economic wellbeing and lobbied for landless emancipation. The so-called “liberal bureaucracy,” on the other hand, pushed for the distribution of land among emancipated former serfs. The emancipation act of 1861, known as the “Manifesto of February 19,” was a political compromise that left no group fully satisfied. According to the manifesto, serfs were granted immediate personal freedom and the right to own personal property. The manifesto also introduced minimum and maximum personal land allotments, which varied with soil type. The landowner and peasants

had the option to agree on an immediate “grant allotment” of one-quarter of the maximum allotment, for which the peasant would not be required to pay or provide obligations. If the peasants wished instead to receive their full land allotment, they became “temporarily obligated” until such time as the landowner chose to begin the “redemption” operation that transferred ownership to the peasantry. The terms of temporary obligation—and, typically, the subsequent redemption process—were to be established during a two-year transition period, as regulatory charters (*ustavnye gramoty*) specifying land allotments, payments, and the general framework of landlord-peasant relations were compiled by the landlord in cooperation with the peasantry.

The Russian government was fully aware that the reform’s content, while improving serfs’ lot by providing legal freedom and the distribution of some land, nevertheless did not represent the maximum possible improvement on the status quo. Indeed, the government worried that peasants would be dissatisfied with the Manifesto, and fear of unrest was such that before its publication special security measures were taken, with stallions ready to spirit the tsar from a rebelling capital (Zaionchkovskii, 1968, p. 159). Notwithstanding these fears, there was no real rebellion immediately after the Manifesto was published; the wave of peasant unrest came only later, during the period when reform was being implemented on individual estates. As Finkel, Gehlbach and Olsen (2015) show, there was a substantial increase in unrest among former serfs during the transition period described above, with no corresponding change among state peasants (peasants who lived on state lands), who were not directly affected by the reform. Across the empire, thousands of peasants refused to provide *barshchina* or *obrok*, physically attacked landowners and their families, took up arms, and engaged in other forms of resistance.

What accounted for the peasant unrest that followed emancipation? Our model suggests that reform provokes rebellion when state capacity is weak and grievances are driven by the failure of local actors to fully implement reform. We address each of these factors in the following section.

## 4.2 State capacity, local implementation, and perceptions of loss

A key feature of the emancipation reform was the inability of the central government to carry out reform on its own. Outside of major urban centers, the Russian state's control of its territory was limited at best. As Skocpol (1979) notes, “[i]mperial jurisdiction stopped just outside the doors of the noble-owned serf estates” (p. 89), which is precisely where the government needed to be to implement the reform. The state's weakness was an inevitable outcome of the monarchy's conscious policy of reliance on the nobility as its local agents. Ironically, the peasant revolts of the seventeenth and eighteenth centuries had “convince[d] the state of the value of the nobility as a police force in the provinces” (Moon, 2001, p. 27).

The government's weakness extended to the very center of the state apparatus. The Russian government did not have the institutional capacity or the manpower to carry out reform on its own. It didn't even know the lay of the land. Throughout the 1840–50s, the Russian government carried out a number of cadastral surveys, but no national cadastre existed (Evtuhov, 2011). The land surveyors who could have been tasked with carrying out a national cadastre were in short supply and of uncertain professional abilities (Khristoforov, 2011; Dower and Markevich, 2017). The political and security police (the Third Section of the Imperial Chancellery and the Special Corps of Gendarmes, respectively) had fewer than five thousand servicemen for the entire empire. The only way to carry out the reform was by delegating its implementation to local actors with a stake in the pre-existing status quo.

Reform's local implementation became its key challenge. In principle, the peasants were entitled to their existing land allotments, but so ambitious a reform and the very fact that the reform's content was a compromise among numerous conflicting policy proposals provided local elites with ample opportunities for gerrymandering. Fearful for their economic wellbeing in a new, post-serfdom world, numerous landlords jumped at the opportunity to keep the estate's best land for themselves (especially in regions with fertile soil) and to ensure that former serfs received as little valuable land as possible.

Anticipating potential conflicts between dissatisfied peasants and landlords, as part of



the emancipation reform the government created the new institution of “peace arbitrators” (*mirovie posredniki*), tasked with the verification of charters and the resolution of conflicts between landlords and the newly liberated peasants. Nonetheless, even for this institution the weak Russian state was forced to rely on local elites. Regional governors were asked to find reform sympathizers from among the local landowning (and often serf-owning) nobility to fill these positions; Leo Tolstoy was a notable example (Ust’iantseva, 1992; Easley, 2002). In some areas, however, supporters of emancipation among the nobility were nowhere to be found, and government efforts notwithstanding, individuals of “every political stripe, with varying degrees of vulnerability to local pressures” were drafted into the institution (Easley, 2002, p. 711). Many found it hard to be neutral while the interests of neighboring landlords were at stake, and some used outright violence, including flogging, to compel peasants to accept the charter terms.

Even when the arbitrators were willing to confront local elites, the landlords were often able to neutralize the “troublesome” mediators by using a combination of political, psychological, and even physical pressure. “They want to beat me up, they want me to be put on trial . . . I am simply waiting until they calm down a bit (*pougomonilis’*) and then I will retire,” wrote Tolstoy about his relations with local landlords (Ust’iantseva, 1992, p. 179). Tolstoy’s experience is far from being unique: from 1861 to 1863, more than 25 percent of arbitrators quit their roles, often as a result of pressure and hostility from landowners (Easley, 2002, p. 727). With peace arbitrators sidelined and with no accountability to the central government, the implementation of reform became a purely local process.

Against this backdrop, it is not surprising that former serfs blamed the local nobility for their failure to fully implement reform.<sup>11</sup> The design of reform played to this tendency. Most serfs learned of emancipation when the Manifesto was read out in Sunday church services. This public articulation of the tsar’s intention may have set a new (and common) reference

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<sup>11</sup>Russian culture may have also played a role, as peasants were unlikely to hold the “good tsar” accountable for any shortcomings (e.g., Whittaker, 1992; Montefiore, 2016).

point against which the implementation of reform was measured. The actual outcome of reform would thus have been substantially experienced as a loss, relative to that with which peasants were “endowed” by the reform’s formal design.

With peasant grievances directed toward local elites with a stake in the status quo, a weak state could not hope to pacify the peasantry. The price of reform was rebellion.

## 5 Conclusion

Tocqueville’s conjecture was that citizens would be most likely to rebel precisely when reform promised to improve their lives for the better. We provide a microfoundation for this claim, showing that reforms that are introduced centrally but implemented locally create the conditions for rebellion by driving a wedge between what citizens expect and what they receive. By setting a reference point against which local implementation falls short, reform creates grievances that may be only partially offset by reform’s improvement over the status quo. It is the failure of officials to fully internalize these grievances that produces the Tocqueville paradox.

At the same time, our analysis places bounds on the effect that Tocqueville describes. When reform is predominantly centrally rather than locally implemented, reform reduces rebellion. And when the state has capacity to sanction local officials who refuse to carry out reform, then reform unambiguously reduces rebellion, regardless of the degree of local implementation.

Our results imply a need to recalibrate theories of regime change and autocratic stability. Even ignoring intertemporal commitment problems of the sort emphasized by Acemoglu and Robinson (2006), the ability of governments to buy off excluded groups should not be taken for granted. An implicit assumption of extant models seems to be the existence of a state with sufficient capacity to guarantee that reform will actually be implemented as intended. In the absence of such capacity, the implementation of reform will typically fall short of its

promise, producing feelings of loss that encourage rebellion against those responsible.

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## Appendix A: Microfoundations

In Section 1, we analyze a model in which the probability that the citizenry rebels is  $F(z)$ , where

$$z \equiv \lambda(\gamma - x) - \beta(\gamma - \hat{\gamma}) - \eta. \quad (16)$$

Here we derive this relationship from a simple model of strategic interaction among local citizens, whose coordinated participation is necessary for rebellion to be successful, and a leader who decides whether to allow rebellion to proceed.

There is a continuum of citizens, indexed by  $j$ . Each citizen decides whether to participate in a local rebellion. Any citizen who chooses not to rebel receives a payoff normalized to zero. Consider now the payoff from participation. Any citizen  $j$  has a grievance

$$\tilde{\Gamma}(x) \equiv \lambda(\gamma - x) - \beta(\gamma - \hat{\gamma}) + \xi. \quad (17)$$

We assume  $\xi \geq \beta(\gamma - \hat{\gamma})$ . Following Passarelli and Tabellini (2017), we assume that the expressive payoff from participating in rebellion is proportional to the grievance and the (endogenous) proportion  $g$  of citizens who rebel. Any citizen who participates further bears a cost  $\varepsilon + u_j$ . We treat  $\varepsilon$  as exogenous—that is, as realized prior to the decision of individual citizens to participate (but after the choice of  $x$  by the local elite). The idiosyncratic component  $u_j$ , in turn, is drawn from a uniform distribution on  $[-\phi, \phi]$ , where  $\phi$  is sufficiently large to ensure that  $g \in (0, 1)$ . With these assumptions, the marginal benefit of participation is

$$g\tilde{\Gamma}(x) - \varepsilon - u_j.$$

To guarantee a unique level of rebellion in equilibrium (see Lemma A1 and the surrounding discussion for an analogous argument when strategic complementarities are across rather than within localities), we assume that there is sufficient heterogeneity in the idiosyncratic cost of rebellion:

**Assumption 3.**  $\tilde{\Gamma}(0) < 2\phi$ .

Depending on its distribution,  $\varepsilon$  (realized before citizens decide whether to participate) may take values sufficiently low or high such that all or no citizens, respectively, choose to rebel. For moderate values of  $\varepsilon$ , the proportion of citizens who participate is given implicitly by

$$g = \frac{g \cdot \tilde{\Gamma}(x) - \varepsilon + \phi}{2\phi},$$

which follows from the assumption that  $u_j$  is distributed uniformly on  $[-\phi, \phi]$ . Solving for  $g$  gives

$$g = \frac{\phi - \varepsilon}{2\phi - \tilde{\Gamma}(x)}.$$

Assumption 3 guarantees that the denominator of this expression is positive for all  $x \in [0, \gamma]$  and thus that there is a unique level of rebellion in equilibrium.

To derive  $F(z)$  as defined above, we additionally assume that there is a local citizen leader who allows rebellion to proceed if and only if  $g \geq \bar{g}$ , where  $\bar{g}$  is an exogenous threshold that determines that rebellion is “worth it.” Intuitively, we can think of the citizen leader as being in a position to apply selective incentives not to participate if it appears that rebellion is unlikely to be successful. From the perspective of the local elite, which treats  $\varepsilon_i$  as a random variable, the probability of rebellion is therefore

$$\Pr\left(\frac{\phi - \varepsilon}{2\phi - \tilde{\Gamma}(x)} \geq \bar{g}\right),$$

or

$$\Pr\left(\frac{\varepsilon}{\bar{g}} \leq \tilde{\Gamma}(x) - \frac{\phi}{\bar{g}}(2\bar{g} - 1)\right) = \Pr\left(\frac{\varepsilon}{\bar{g}} \leq \lambda(\gamma - x) - \beta(\gamma - \hat{\gamma}) + \xi - \frac{\phi}{\bar{g}}(2\bar{g} - 1)\right).$$

where the equality uses the definition of  $\tilde{\Gamma}(x)$  in Equation 17. Defining  $\epsilon \equiv \varepsilon/\bar{g}$  and  $\eta \equiv -\xi + \frac{\phi}{\bar{g}}(2\bar{g} - 1)$  gives the relationship in Equation 16.

## Appendix B: Proof of Proposition 1

The derivation of  $x^*$  follows the discussion in the text. To see that a strictly increasing hazard rate ensures that the second-order condition is satisfied for an interior solution, observe that the second derivative of the maximand in Problem 5 with respect to  $x$  is

$$-f(z(x))\lambda - [f(z(x)) - (x-p)f'(z(x))\lambda]\lambda,$$

which is less than zero in a neighborhood of  $x = x^*$  if

$$\frac{f'(z(x^*))}{f(z(x^*))} > -\frac{2}{(p-x^*)\lambda},$$

where we note from Equation 6 that  $p > x^*$ . Substituting from Equation 6 gives

$$\frac{f'(z(x^*))}{f(z(x^*))} > -2 \cdot \frac{f(z(x^*))}{1-F(z(x^*))}. \quad (18)$$

Now observe that a strictly increasing hazard rate implies, for all  $z$ ,

$$\frac{f'(z)[1-F(z)] + f(z)^2}{[1-F(z)]^2} > 0,$$

which in turn implies

$$\frac{f'(z)}{f(z)} > -\frac{f(z)}{1-F(z)}. \quad (19)$$

Clearly, if Condition 19 holds for all  $z$ , then Condition 18 must also hold.  $\square$

# The Tocqueville Paradox: Additional Material

## Instrumental motivations

The following assumptions ensure that the random variable  $\epsilon$  is strictly increasing on an interval sufficiently wide to ensure a non-degenerate probability of rebellion.

**Assumption A1.**  $F(\lambda(p - \gamma) - \psi\beta(\gamma - \hat{\gamma}) - \eta) > 0$ .

**Assumption A2.**  $F(\lambda(p + \psi\gamma) - \psi\beta(\gamma - \hat{\gamma}) - \eta) < 1$ .

Define

$$z' \equiv \lambda(p - x) + \psi[\lambda(\gamma - x) - \beta(\gamma - \hat{\gamma})] - \eta.$$

The next three propositions immediately follow.

**Proposition A1.** *Assume that Assumptions A1 and A2 are satisfied. If the hazard rate  $H$  is strictly increasing, the optimal local implementation of reform  $x^*$  in the model with instrumental motivations is given implicitly by*

$$x^* = \max \left[ p - \frac{1}{(1 + \psi)\lambda} \cdot \frac{1 - F(z'(x^*))}{f(z'(x^*))}, 0 \right]. \quad (\text{A1})$$

*Proof.* Analogous to that for Proposition 1. □

**Proposition A2.** *Assume that Assumptions A1 and A2 are satisfied. If the hazard rate  $H$  is strictly increasing and  $x^* > 0$ , a marginal increase in reform  $\gamma$  increases (decreases) local reform implementation in the model with instrumental motivations if and only if  $\lambda$  is greater (less) than  $\beta$ .*

*Proof.* Analogous to that for Proposition 2, with

$$\frac{\partial x^*}{\partial \gamma} = \left[ 1 + \frac{H'(z'(x^*))}{[H(z'(x^*))]^2} \right]^{-1} \frac{H'(z'(x^*))}{[H(z'(x^*))]^2} \cdot \frac{\psi}{1 + \psi} \cdot \frac{\lambda - \beta}{\lambda}.$$

□

**Proposition A3.** *Assume that Assumptions A1 and A2 are satisfied. If the hazard rate  $H$  is strictly increasing, the equilibrium probability of rebellion in the model with instrumental motivations is increasing (decreasing) in reform  $\gamma$  if and only if  $\lambda$  is greater (less) than  $\beta$ .*

*Proof.* Analogous to that for Proposition 3. □

## Interdependent rebellion

The analysis to follow assumes for verisimilitude that citizens observe local implementation only in their own locality, but this is without loss of generality: the analysis is similar, and our results identical, if the choice of  $x_i$  for each locality  $i$  is commonly observed. Letting  $I$  denote the set of all localities, we define an equilibrium as follows.

**Definition A1.** *An equilibrium of the model with spillovers is a strategy profile*

$$\beta = ((x_i)_{i \in I}, (\rho_i(e_i))_{i \in I}),$$

*and a belief assessment  $\mu$ , such that*

1. *For all  $i$ ,  $x_i = \bar{x}$ .*
2. *The pair  $(\beta, \mu)$  is sequentially rational and consistent.*

Condition 1 restricts attention to equilibria that are symmetric, in the sense that elites choose a common level of reform implementation. Condition 2 is simply the definition of sequential equilibrium applied to our setting.

The assumption of symmetric equilibrium implies that the “rebellion game” (i.e., the subform that follows choice of  $x_i$  in each locality  $i$ ) takes a particular form. Consider the decision to rebel in any locality  $i$ . The citizenry in  $i$  chooses to rebel if

$$\epsilon_i < h\tilde{\Gamma}(x_i) - \eta. \tag{A2}$$

In principle, localities may differ not only in their idiosyncratic cost of rebellion  $\epsilon_i$ , but also in their beliefs about the level of reform implementation in localities other than their own,

which by assumption is unobserved. Condition 1 of the equilibrium definition, however, requires that elites in all localities  $i$  choose a common  $x_i = \bar{x}$ . Moreover, the consistency requirement of sequential equilibrium implies that citizens believe that  $\bar{x}$  has been chosen in all localities other than their own. Together, these considerations imply that the proportion of localities that rebel is defined implicitly by

$$h = F\left(h\tilde{\Gamma}(\bar{x}) - \eta\right). \quad (\text{A3})$$

It is straightforward to establish that Equation A3 has a unique fixed point for all  $\bar{x} \in [0, \gamma]$  if there is sufficient heterogeneity in the idiosyncratic cost of rebellion  $\epsilon_i$ .

**Assumption A3.**  $F(-\eta) > 0$ .

**Assumption A4.**  $F\left(\tilde{\Gamma}(0) - \eta\right) < 1$ .

**Lemma A1.** *[Passarelli and Tabellini, 2017] Assume that Assumptions A3 and A4 are satisfied. For all  $\bar{x} \in [0, \gamma]$ , there exists a fixed point  $h^*(\bar{x}) \in (0, 1)$  of Equation A3. This fixed point is unique if*

$$\tilde{\Gamma}(\bar{x}) \cdot f\left(h^*(\bar{x})\tilde{\Gamma}(\bar{x}) - \eta\right) < 1. \quad (\text{A4})$$

*Proof.* Define

$$d(h) = F\left(h\tilde{\Gamma}(\bar{x}) - \eta\right) - h.$$

By Assumption A3, for all  $\bar{x} \in [0, \gamma]$ , there are localities that would choose to rebel if no others do so, implying  $d(0) > 0$ . Similarly, by Assumption A4,  $d(1) < 1$  for all  $\bar{x} \in [0, \gamma]$ , as there are localities that would choose not to rebel even if all others do so. Together, these two conditions imply that any fixed point of Equation A3 is interior. Existence of such a fixed point is guaranteed by Brouwer's fixed-point theorem, given the continuity (because differentiable) of  $F$ . Uniqueness, in turn, is established by Condition A4, which implies that  $d(h)$  is decreasing in  $h$  in the neighborhood of any solution.  $\square$

In what follows, we use the following assumption, which ensures that Condition A4 holds for all  $\bar{x} \in [0, \gamma]$ .

**Assumption A5.** For all  $\bar{x} \in [0, \gamma]$ ,  $\tilde{\Gamma}(\bar{x}) \cdot f\left(h^*(\bar{x})\tilde{\Gamma}(\bar{x}) - \eta\right) < 1$ .

Substituting  $h^*(\bar{x})$  into Condition A2 gives the probability that the citizenry in locality  $i$  rebels as

$$F\left(h^*(\bar{x})\tilde{\Gamma}(x_i) - \eta\right). \quad (\text{A5})$$

The elite in locality  $i$  anticipates the relationship between reform implementation and rebellion captured by this expression in solving

$$\max_{x_i} -x_i + F\left(h^*(\bar{x})\tilde{\Gamma}(x_i) - \eta\right)(x_i - p). \quad (\text{A6})$$

Taking the first-order condition and imposing  $x_i = \bar{x}$  gives the equilibrium level of local implementation.

**Proposition A4.** Assume that Assumptions A3–A5 are satisfied. If the hazard rate  $H$  is strictly increasing, the common local implementation of reform  $\bar{x}$  in the model with spillovers is given implicitly by

$$\bar{x} = \max \left[ p - \frac{1}{h^*(\bar{x})\lambda} \cdot \frac{1 - F\left(h^*(\bar{x})\tilde{\Gamma}(\bar{x}) - \eta\right)}{f\left(h^*(\bar{x})\tilde{\Gamma}(\bar{x}) - \eta\right)}, 0 \right]. \quad (\text{A7})$$

*Proof.* Equation A7 follows directly from Problem A6. A proof analogous to that for Proposition 1 ensures that the second-order condition is satisfied for an interior solution.  $\square$

The next two propositions immediately follow.

**Proposition A5.** Assume that Assumptions A3–A5 are satisfied. If  $\bar{x} > 0$ , a marginal increase in reform  $\gamma$  increases (decreases) local reform implementation in the model with spillovers if and only if  $\lambda$  is greater (less) than  $\beta$ .

*Proof.* Differentiating Equation A7 implicitly with respect to  $\gamma$  for the case  $\bar{x} > 0$  gives

$$\frac{\partial \bar{x}}{\partial \gamma} = \frac{1}{\lambda} \left[ \frac{h'}{h^2} \cdot \frac{1}{H} \cdot \frac{\partial \bar{x}}{\partial \gamma} + \frac{H'}{H^2} \cdot \frac{1}{h} \left( h' \tilde{\Gamma}(\bar{x}) \frac{\partial \bar{x}}{\partial \gamma} + h \left( \lambda - \lambda \frac{\partial \bar{x}}{\partial \gamma} - \beta \right) \right) \right], \quad (\text{A8})$$

where  $H'$  is the derivative of  $H$  and  $h'$  is the derivative of  $h$ ; we drop arguments for notational compactness. Rearranging gives

$$\frac{\partial \bar{x}}{\partial \gamma} = \left[ 1 - \frac{1}{q\lambda} \cdot \frac{h'}{h^2} \cdot \frac{1}{H} - \frac{1}{\lambda} \cdot \frac{H'}{H^2} \cdot \frac{1}{h} \cdot h' \tilde{\Gamma}(\bar{x}) + \frac{H'}{H^2} \right]^{-1} \frac{H'}{H^2} \cdot \frac{\lambda - \beta}{\lambda}.$$

By assumption of a strictly increasing hazard rate,  $H' > 0$ . Further, differentiating Equation A3 implicitly with respect to  $\bar{x}$  and rearranging gives

$$\frac{\partial h}{\partial \bar{x}} = -\frac{h\lambda f(\cdot)}{1 - \tilde{\Gamma}(\bar{x}) f(\cdot)} < 0.$$

Thus,  $\frac{\partial \bar{x}}{\partial \gamma} \geq 0$  if and only if  $\lambda \geq \beta$ . □

**Proposition A6.** *Assume that Assumptions A3–A5 are satisfied. The equilibrium probability of rebellion in any locality  $i$  in the model with spillovers is increasing (decreasing) in reform  $\gamma$  if and only if  $\lambda$  is greater (less) than  $\beta$ .*

*Proof.* Differentiating Equation A5 with respect to  $\gamma$  gives

$$f(\cdot) \left( h' \tilde{\Gamma}(\bar{x}) \frac{\partial \bar{x}}{\partial \gamma} + h \left( \lambda - \lambda \frac{\partial \bar{x}}{\partial \gamma} - \beta \right) \right).$$

For  $\bar{x} = 0$ ,  $\frac{\partial \bar{x}}{\partial \gamma} = 0$  and the statement in the proposition immediately follows. For  $\bar{x} > 0$ , we can use Equation A8 to substitute for the equation in parentheses, giving

$$f(\cdot) \frac{\partial \bar{x}}{\partial \gamma} \left( 1 - \frac{1}{\lambda} \cdot \frac{h'}{h^2} \cdot \frac{1}{H} \right) \lambda \frac{H^2}{H'}.$$

As  $H' > 0$  (by assumption of a strictly increasing hazard rate) and  $h' < 0$  (see the proof to Proposition A5), the equilibrium probability of rebellion is increasing (decreasing) in  $\gamma$  if and only if  $\bar{x}$  is increasing (decreasing) in  $\gamma$ , and thus (by Proposition A5) if and only if  $\lambda$  is greater (less) than  $\beta$ . □