Online Appendixes for "Does Reform Prevent Rebellion? Evidence from Russia's Emancipation of the Serfs"

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Appendix A: A simple model of rebellion

In this appendix we present a simple model to illustrate the various channels by which reform might affect rebellion. Our model takes the form of a global game, a class of models of collective action under incomplete information.[1] The key assumption of such models is that there is some feature of this environment that is not common knowledge but about which actors receive correlated private signals. In our setting, we assume this to be the cost of rebelling, though we could instead assume incomplete information about some other characteristic, so long as the model continues to satisfy strategic complementarity (actors are better off taking an action if others take the same action) and two-sided limit dominance (there are some signals such that an actor would prefer to take an action even if nobody else does so and other signals such that an actor would prefer not to take that action however many others do so).

In particular, consider a continuum of peasants, indexed by i. Each peasant makes a decision ρ_i to rebel or not, where $\rho_i = 1$ indicates that the peasant rebels. Rebellion is costly, where peasant i bears a cost η_i if $\rho_i = 1$. We assume that the cost of rebellion is correlated across peasants, with $\eta_i = \eta + \epsilon_i$, where η is drawn from a uniform density on the real line and ϵ_i is drawn from a distribution with continuous density with support on the real line. (We follow Morris and Shin (2003) in assuming an "improper" prior belief about η, noting as they do that conditional probabilities are well defined.) Each peasant observes her own idiosyncratic cost but not that of any other peasant before deciding whether to rebel.

The probability of a successful rebellion depends on how many peasants choose to rebel. For simplicity, assume that the probability of a successful rebellion is qh, where h is the (endogenous) proportion of peasants who choose $\rho_i = 1$ and $q \in (0,1)$ is a parameter of the model that captures the ease of rebellion. If a rebellion is successful, then proportion $\gamma \in (0,1)$ of land valued at $\theta > 0$ is divided equally among all peasants who chose $\rho_i = 1$; peasants who chose $\rho_i = 0$ receive a payoff of zero. In contrast, if a rebellion is unsuccessful,

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[1]For an introduction to such models, see Gehlbach (2013).

then any peasant who chose $\rho_i = 1$ receives a payoff of zero, whereas any peasant who chose $\rho_i = 0$ receives a payoff of $\lambda > 0$, where the parameter λ can be understood as the value to any peasant of the existing distribution of land.

This formalization follows, for example, Popkin (1979), who observes that the "political economy approach emphasizes that peasants weigh the risk of trading the status quo for a lottery between successful action and failure. Of course, *no contribution* [i.e., no participation; italics in original] is also a risky situation with lottery elements" (p. 258). In particular, the payoffs capture the idea that there is a benefit to choosing the winning side: rebelling when rebellion is successful, not rebelling when rebellion is unsuccessful. Put differently, we assume the existence of selective incentives to rebellion, as have been documented in various studies of peasant unrest (e.g., Lichbach, 1994). At the cost of additional notation, this stylized assumption can be somewhat relaxed, such that there is a collective benefit to (non)participation (e.g., Bueno de Mesquita, 2010), possibly different for successful and unsuccessful rebellions.

The payoff to any peasant i from choosing $\rho_i = 1$ is therefore

$$qh\left(\frac{\gamma\theta}{h}\right) + (1 - qh) \cdot 0 - \eta_i,$$

whereas the payoff from choosing $\rho_i = 0$ is

$$qh \cdot 0 + (1 - qh)\lambda.$$

The marginal benefit of choosing $\rho_i = 1$ is thus

$$q\gamma\theta - (1 - qh)\lambda - \eta_i.$$

As this expression satisfies assumptions A1–A5 in Morris and Shin (2003), we can use the results there to establish that there is a cutpoint equilibrium, where any peasant i rebels if $\eta_i < \eta^*$ and does not rebel if $\eta_i > \eta^*$, where

$$\eta^* \equiv q\gamma\theta - \lambda \int_0^1 (1 - qh)dh = q\gamma\theta - \lambda\left(1 - \frac{q}{2}\right). \tag{A1}$$

Up to indifference at $\eta_i = \eta^*$, this is the unique strategy surviving iterated elimination of strictly dominated strategies.

Equation A1 says that peasants are more likely to rebel when the ease of rebellion q is high, the payoff from successful rebellion $\gamma\theta$ is large, and the value from the existing distribution of land λ is small. We can use this theoretical framework to think about the potential effects of reform on rebellion. First, reform may affect peasant welfare through the status quo payoff λ, which on average (e.g., across villages with possibly different costs of rebellion) would change the incidence of peasant unrest by moving the cutpoint η^*. Second, by raising expectations about what peasants could claim through collective action, reform may increase the (expected) payoff from successful rebellion $\gamma\theta$, which would have the effect of raising the cutpoint η^*. Notably, this effect would be greatest in regions where land is particularly valuable, that is, where θ is large. Finally, reform may change the ease of rebellion, expressed in the model by the parameter q.

References

Bueno de Mesquita, Ethan. 2010. "Regime Change and Revolutionary Entrepreneurs." *American Political Science Review* 104(3):446–466.

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Lichbach, Mark I. 1994. "What Makes Rational Peasants Revolutionary? Dilemma, Paradox, and Irony in Peasant Collective Action." *World Politics* 46(3):383–418.

Morris, Stephen and Hyun Song Shin. 2003. Global Games: Theory and Applications. In *Advances in Economics and Econometrics: Theory and Applications, 8th World Congress of the Econometric Society*, ed. Mathias Dewatripont, Lars Peter Hansen and Stephen J. Turnovsky. New York: Cambridge University Press.

Popkin, Samuel L. 1979. *The Rational Peasant: The Political Economy of Rural Society in Vietnam.* Berkeley, CA: University of California Press.

Appendix B: Coding of event data

Chronicle Location (*Krest'ianskoe dvizhenie v Rossii*)

- Volume (`volume`)
- Page number (`pagenum`)

Event Date

- Start month (`startmonth`: 1–12, 13–16 correspond to winter/spring/summer/fall, 17 unknown, 18 start of year)
- Start year (`startyear`)
- End month (`endmonth`: 1–12, 13–16 correspond to winter/spring/summer/fall, 17 unknown, 18 start of year)
- End year (`endyear`)

Event Duration (`eventtimeframe`)

1. Single date
2. Multiple dates
3. Date range
9999. Not specified

Guberniya (multiple locations possible: `guberniya1`, etc.)

1. Arkhangelsk
2. Astrakhan
3. Bessarabia
4. Chernigov
5. Courland
6. Estonia
7. Hrodna
8. Kaluga
9. Kazan
10. Kharkov
11. Kherson
12. Kiev
13. Kostroma
14. Kovno
15. Kursk
16. Minsk
17. Mogilev
18. Nizhni Novgorod
19. Novgorod
20. Olonets
21. Orel
22. Orenburg
23. Penza

24. Perm
25. Petersburg
26. Podolia
27. Poltava
28. Pskov
29. Ryazan
30. Samara
31. Saransk
32. Saratov
33. Simbirsk
34. Smolensk
35. Suwalki
36. Tambov
37. Taurida
38. Tiflis
39. Tula
40. Tver
41. Vilna
42. Vitebsk
43. Vladimir
44. Volhynia
45. Voronezh
46. Vyatka
47. Yaroslavl
48. Yekaterinoslav
49. Moscow
50. Kurliandia
51. Vologda
52. Kutaisi
53. Stavropol
54. Erivan
55. Livonia
56. Don Voisko
57. Dagestan
58. Ufa
9999. Not specified

Number of districts (`numuyezd`)

1. 1
2. 2
3. 3
4. 4
5. 5
6. > 5 (see `uyezdnum`)
7. Multiple (number unspecified)

9999. Not specified

Number of villages (`numvillage`)

1. 1
2. 2
3. 3
4. 4
5. 5
6. > 5 (see `villagenum`)
7. Multiple (number unspecified)

9999. Not specified

Number of estates (`numestate`)

1. 1
2. 2
3. 3
4. 4
5. 5
6. > 5 (see `estatenum`)
7. Multiple (number unspecified)

9999. Not specified

Peasant Type (`peasanttype`)

1. Former appanage
2. State
3. Landowner
4. Former landowner
5. Former state
6. Appanage
7. Rebel detachment
8. Temporarily obligated
9. Landowner and state
10. Soldiers
11. Landowner, state, and appanage
12. State and appanage
13. Landowner and soldier

9999. Not specified

Cause (multiple causes possible: `peasantcause1`, etc.)

Landlord-Peasant Relations

1. *Barshchina*
2. Brutal treatment
3. Provisioning/compensation (from landlord to peasants)

4. Debts
5. Dissatisfaction with land allotment
6. Military enlistment
7. *Obrok*
8. Taxes
9. Violation of inventory/regulatory charter
16. Eviction
17. Seizure of crops/livestock
18. Seizure of land
22. Resettlement
23. Sale of peasants
24. Imprisonment

Serf status

10. Desire to be state peasant
11. Desire to be released from serf status
12. Serf status

Liberation

13. Anticipation of (second) liberation
14. Rumors of liberation
15. Terms of liberation
28. Printed materials dealing with liberation

Estate

19. Dissatisfaction with management
20. Dissatisfaction with municipal government
21. Transfer of estate ownership
26. Dissatisfaction with alcohol prices

Other

27. Other cause

Action (multiple actions possible: `peasantaction1`, etc.)

Refusal

1. Refusal to accept terms of liberation (general)
2. Refusal to obey (general)
3. Refusal to provide obligations
4. Refusal to pay for land
5. Refusal to pay *obrok*
6. Refusal to pay tax

7. Refusal to provide *barshchina*
8. Refusal to purchase (other)
9. Refusal to purchase lumber
10. Refusal to purchase/drink alcohol
34. Unauthorized leave
39. Refusal to elect representatives

Complaint

11. Complaint to governor
12. Complaint to grand duke
13. Complaint to justice minister
14. Complaint to minister of internal affairs
15. Complaint to police
16. Complaint to tsar
17. Complaint to other
18. Complaint to unknown

Theft and violence

20. Prisoners freed
21. Seizure of landowner's property (forest/lumber)
22. Seizure of public property
23. Seizure of landowner's property (general)
24. Violence against landlord/family
25. Violence against landlord/family (murder)
26. Violence against management
27. Violence against management (murder)
28. (Attempted) destruction of landowner's property
30. Unspecified unrest (inc. *volnenie*: see text for details)
35. (Attempted) destruction of public property
36. Violence against public authority
37. (Attempted) destruction of pub (*lavka*)

Governance

31. Change in estate administration
33. Change in municipal administration

Other

9999. Other action

Government response (multiple responses possible: govtresponse1, etc.)

1. Military detachment
2. Prisoners released
3. Imprisonment
4. Military detachment (conflict)
9999. None listed