The Informational Dynamics of Regime Change

Description

This model studies the informational dynamics preceding political uprising in authoritarian regimes. Before deciding whether or not to start protests, agents need to estimate how widespread discontent with the regime is. This model simulates the information dynamics occurring when agents attempt to elicit the level of general discontent without exposing themselves too much. They do so in personal communication. In talking to a stranger, an agent needs to decide whether to bring the conversation to this topic. She will only do so if she judges the chance of upheaval as high enough that it's worth asking. Her communication partner will then reveal her personal attitude (in a not-necessarily truthful way). Between such conversations, agent move around in a speed determined by the society's mobility. We study the influence of said mobility, the actual number of discontent agents, the initial estimate of this number and the learning rule employed on whether agents will, in the long run, assess regime change as possible or not. Moreover, we study whether informational shocks (short term events impacting every agents' assessment, such as a prevalent rumor or a violent police campaign) can impact overall attitudes in the long run.

Layout:

There is a fix number of agents, controlled by *number_of_agents*. Each agent has a private attitude towards the regime, she either is a regime critique or supports the regime. How many agents there are of either type is regulated by the slider *share_regime_supporters*. An agent's attitude towards the regime does not change within a simulation run. Independent of their own attitude, each agent tries to estimate whether overall discontent with the regime is sufficiently high that a successful uprising is possible. This estimate is expressed as a number in the interval [0,1]. At the beginning of a simulation run, agents start with an initial estimate, drawn from a normal distribution with variance 0.2 around the input parameter *initial_expectation_of_change*. Agents then update their estimates through interaction with others. Agents that estimate the prospects of change high (at least 0.5) are colored green, else they are colored red.

Model Dynamics

Each interaction round consists of three phrases. In the first phase, agents randomly pair up with a neighbor chosen from their Moore Neighborhood. If no such neighbor is available or every neighbor is already teamed up with somebody else, agents remain unpaired. In the second phase, agents interact with their chosen partner. Such interaction starts with one partner deciding whether regime change is a realistic enough possibility for her to bring up the topic in conversation.

She does so iff her estimate is above 0.5. In this case, the second interaction partner reveals his personal attitude towards the regime. Both agents then update their beliefs with the learning rule described below. Finally, in the third phase of a round, every agent moves a fix distance, controlled by the input parameter *mobility.* Each spot can only be occupied by one agent; an agent will move until she finds a free space.

The simulation continues for a maximum of 1000 rounds. Simulations are aborted early if all agents are red or all but at most ten agents are green. In this case, running the simulation longer would not produce further change.

Information updates

Within the personal communication described above, both agents may gain additional information about the likelihood of regime change. If the first agent decides to bring up the topic, she learns whether her counterpart is discontent with the regime (I=1) or not (I=0). But also the latter agent gains new information. In observing whether the first agent brings up the topic of regime change, she learns whether this agent deems regime change a relevant enough topic to address (I=1) or not (I=0). Both feedbacks are incorporated into the agents belief by a weighted average:

$$estimate\_new = (1-w) * estimate\_old + w*I$$

In this formula, w denotes the weight an agent is willing to attribute to new information. This weight is controlled by the input variable *weight_new_information.*

Shocks

The shock button reduces the estimate of each agent by a random number between 0 and 0.5

Things to notice

- In the long run, all agents will obtain the same color, i.e. they will all agree in their estimate whether there is enough discontent for regime change to become possible or not.
- At a mobility of 1, local clusters of green and red agents can form. In this case, red clusters expand slowly, i.e. agents begin to belief that there is no potential for an uprising. As a consequence, less simulations end up with all agents green than with higher mobilities. The existence of clusters is tracked by the Monitor ‘Segregation’, calculation the Bray-Curtis index of dissimilarity for the distribution of green and red agents.