MASON RebeLand: An Agent-Based Model of Politics, Environment, and Insurgency

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Research funded by ONR MURI grant no. N00014-08-1-0921
(PM Dr. Rebecca Goolsby)
Problem Overview

- Exploring the complex relationship between Government and Populace using an explicit polity (political system) model
- Understanding the feedback amongst Citizen Satisfaction, Issue Management, and Government Legitimacy
- Growing civil unrest and polity instability from the “Bottom Up” within an Agent-Based Model
Research Questions

✦ Under what conditions does state failure lead to civil unrest?
✦ Under what conditions does civil unrest lead to regime change?
✦ What are the characteristic features of society undergoing regime change?
Theoretical Overview

✦ Relative Depravation (Gurr 1968)
✦ Opportunity (Fearon and Laitin 2003)
✦ Greed and Grievance (Collier and Hoeffler 2004)
✦ The Strategy of Violence (Kalyvas 2004)
✦ Battle for the State (Cederman and Girardin 2007)
Model Overview

✦ Constructed using MASON simulation toolkit
✦ Agent Environment
✦ Simulation Agents
✦ Agent Behavior
Agent Environment (1/4)
Agent Environment (2/4)
Agent Environment (3/4)
Agent Environment (4/4)
Simulation Agents

✦ Primary Agents
  ✦ General Population
  ✦ City
  ✦ State

✦ Secondary Agents
  ✦ Rebel
  ✦ Rebel Group
  ✦ Police/Military Unit
General Population

If Satisfied: Continue

Earn

Check Satisfaction

Spend

Eat

Else

Rebel
Check Satisfaction

Unaddressed Social Issues

- Inflation
- Environmental Catastrophe
- Terrorism

Satisfaction

- Perceived Wealth
- Subsistence Needs
- Security
If: Issues Exist
Then
Generate Policy

If: Rebels Exist
Then
Generate Military Unit

Else
Check Issue

Else
Check Rebel
State

- Tax
- Redistribute Funds
- Distribute Food
Secondary Agents

✧ Rebel
  ✧ Avoid Military Units
  ✧ Defend from Attack
  ✧ Commit Terrorism

✧ Rebel Group
  ✧ Support Rebels
  ✧ Fund Alternative Policies

✧ Police/Military Units
  ✧ Seek Rebels
  ✧ Attack Rebels
  ✧ Guard Home City
Model Demonstration

✦ Scenario #1: Stable State
  ✦ Low issue complexity/No terrorism
  ✦ Government remains legitimate

✦ Scenario #2: Semi-Stable State
  ✦ Medium to high issue complexity
  ✦ Strong military pressure on rebels
  ✦ Regime change unlikely

✦ Scenario #3: Unstable State
  ✦ Medium to high issue complexity/Terrorism likely
  ✦ Government usually falls (but not always)
  ✦ Rebels take advantage of government failure
Results - Scenario 1 (1/3)
Results - Scenario 1 (3/3)
Results - Scenario 2 (1/3)
Results - Scenario 2 (2/3)
Results - Scenario 2 (3/3)
Results - Scenario 3 (1/3)
Results - Scenario 3 (3/3)
Questions?