

Contents

1	Introduction	1
1.1	Purpose and Scope	3
1.2	Objectives and Research Questions	4
1.3	Methodology of Development and Structure of the Work	5
2	Theoretical Foundations	7
2.1	Overview of Social Conflict Theories	7
2.2	Violence	10
2.3	Ted Gurr's Frustration-Aggression Theory on the Psychological Factors of Civil Violence	12
2.4	Gene Sharp's Theory of Non-Violent Action	15
2.5	Legitimacy	15
2.6	Concluding Remarks	16
3	Review of Agent-Based Models of Social Conflict and Civil Violence	17
3.1	Agent Definition, Agent Types and Rule-Based Models of Binary Decision	17
3.2	Epstein's Agent-Based Model of Civil Violence	19
3.3	Discussion of Epstein's Agent-Based Model	21
3.3.1	Scope	22
3.3.2	Measures of Size, Duration, and Interval (Waiting Time) of Outbursts	22
3.3.3	Input Parameters, Scales and Mechanisms	23
3.4	Other Models Based Epstein's Agent-Based Model	24
3.5	Concluding Remarks	26
4	Analysis of Conflict Datasets and Indicators: The Case of the “Arab Spring”	29
4.1	Analysis of the Social Conflict Analysis Database for the African “Arab Spring” Countries	29

4.1.1	A Note on Geographic Information, Accuracy of the Information, and Exceptional Events	31
4.1.2	Question 1: How Important Were Demonstrations and Riots, in Terms of Number of Events and Estimated Number of Participants?	32
4.1.3	Question 2: Which Were the Issues, Organization, and Escalation in Large Demonstrations and Riots?.....	34
4.1.4	Question 3: What Were the Patterns of Recurrence, Duration and Size of Demonstrations and Riots?.....	37
4.2	Analysis of Fragile States Index Indicators for the African “Arab Spring” Countries	43
4.3	Analysis of the Freedom in the World Indicator for the African “Arab Spring” Countries	47
4.4	Analysis of the “All the Ginis” Dataset for the African “Arab Spring” Countries	48
4.5	Concluding Remarks.....	48
5	ABM of Civil Violence: ODD Description	51
5.1	Purpose	51
5.2	Entities, State Variables, and Scales.....	52
5.2.1	Agents.....	52
5.2.2	Networks.....	54
5.2.3	Environment	55
5.3	Process Overview and Scheduling	55
5.4	Design Concepts	56
5.4.1	Basic Principles.....	56
5.4.2	Emergence	56
5.4.3	Adaptation	56
5.4.4	Objectives	57
5.4.5	Learning	57
5.4.6	Prediction	57
5.4.7	Sensing	57
5.4.8	Interaction	57
5.4.9	Stochasticity	58
5.4.10	Collectives	59
5.4.11	Observation	59
5.4.12	Initialization	59
5.4.13	Input Data.....	59
5.4.14	Submodels	59
5.5	R Scripts for Pre- and Post-Processing	63
6	Model Exploration and Computer Experiments	65
6.1	Risk Perception and the Estimated Arrest Probability	66
6.1.1	Analytical Study	66
6.1.2	Computer Experiments	76

6.2	The Influence of the Jail Term	79
6.3	Relative Deprivation	83
6.4	Legitimacy Feedback	90
6.4.1	Relative Deprivation with Legitimacy Feedback	91
6.4.2	Legitimacy Feedback in a Scenario of High Legitimacy and Low Repression.....	97
6.5	Network Influences	102
7	Conclusions and Future Work	113
7.1	Conclusions	113
7.2	Future Work	116
	References.....	117