Contents

Introduction
Overview of the thesis .................................................. 2

1 Cooperative game theory .................................................. 5

2 Restricted cooperation ..................................................... 15
  2.1 Graph Theory .......................................................... 15
     2.1.1 Undirected Graphs ............................................ 15
     2.1.2 Directed Graphs ................................................ 16
  2.2 Games with restricted cooperation .................................. 17
     2.2.1 Games with a priori unions .................................. 17
     2.2.2 Communication and games with a graph structure ............ 18
     2.2.3 Hierarchies and games on a directed graph .................. 21
     2.2.4 Feasible set systems .......................................... 33

3 Union values for games with a priori unions ......................... 39
  3.1 Introduction .......................................................... 39
  3.2 The model and solutions ............................................ 42
  3.3 Axiomatizations ...................................................... 42
  3.4 Applications ........................................................ 49
     3.4.1 Airport games ................................................ 49
     3.4.2 Voting power ................................................ 50
  3.5 Concluding remarks ................................................ 52

4 A local approach to games with a permission structure ............. 55
  4.1 Introduction ........................................................ 55
  4.2 Peer group games are digraph games ................................ 56
  4.3 Locally restricted games .......................................... 59
  4.4 The local permission value ........................................ 65
  4.5 Concluding remarks ................................................ 69

5 Accessible union stable systems ....................................... 73
  5.1 Introduction ........................................................ 73
  5.2 Accessible union stable systems ................................... 74
     5.2.1 Accessible union stable systems vs. augmenting systems ... 77
6 Solutions for games with precedence constraints
   6.1 Introduction ................................................. 95
   6.2 Solutions for games with precedence constraints and power measures for acyclic digraphs ............................................. 98
      6.2.1 Irrelevant player independence ................................ 98
      6.2.2 The hierarchical solution for games with precedence constraints .............................. 101
      6.2.3 Weighted precedence solutions for games with precedence constraints .......................... 104
      6.2.4 Precedence power solutions for games with precedence constraints ................................ 105
      6.2.5 The hierarchical measure for digraphs ................................................................. 107
   6.3 Regular set systems and the hierarchical measure .......................... 110
      6.3.1 Chains and regular set systems ................................ 110
      6.3.2 The hierarchical measure for regular set systems ................................................. 113
      6.3.3 The Plurality and Borda measure ................................................................. 116
   6.4 The normalized hierarchical measure for forests and sink forests .................................. 117
      6.4.1 An axiomatization of the normalized hierarchical measure for forests .......................... 118
      6.4.2 An axiomatization of the normalized hierarchical measure for sink forests ......................... 121
   6.5 Concluding remarks ............................................ 128

7 Comparable axiomatizations of four solutions for permission tree games131
   7.1 Introduction ................................................... 131
   7.2 Axiomatizations of four solutions for permission tree games using predecessor axioms ...................... 132
   7.3 Comparing the four solutions ................................... 142
   7.4 Axiomatizations replacing the axioms on predecessors by axioms on superiors ............................. 143
   7.5 Concluding remarks ............................................ 152

Bibliography ......................................................... 159

Samenvatting (summary in Dutch) ........................................ 167

Acknowledgments ..................................................... 171