Contents

List of figures ix
List of tables xi
Preface xv
Acknowledgements xvii

1 Consumer choice in social networks 1
  1.1 Motivation 1
  1.2 Using mobile telecommunications to illustrate the economics of social networks 3
  1.3 Structure of the book 4
  1.4 Why you should read this book 6
    References 9

2 Research into social networks in economics, sociology and physics 11
  2.1 Introduction 12
  2.2 The economics of networks: Key findings from economics and marketing 13
    2.2.1 Introduction 13
    2.2.2 Definition of network effects 14
    2.2.3 Direct network effects 15
    2.2.4 Indirect network effects 17
    2.2.5 Implications for company strategies 18
  2.3 Social network analysis: Key findings from sociology 24
    2.3.1 A short history 24
    2.3.2 Network analysis basics 27
    2.3.3 Design of social network studies 29
  2.4 Key findings from physics research into complex networks 30
  2.5 Empirical research on social networks and network effects 32
    2.5.1 Introduction 32
    2.5.2 Big data: Massive electronic social networks 32
vi CONTENTS

2.5.3 Challenges when identifying causal relationships in social networks 33
2.5.4 Empirical strategies to identifying causal effects in social networks 35
2.5.5 Empirical challenges and advances in the economics of network literature 38
2.6 Summary 40
References 40

3 Marketing in social networks: The iPhone 47
3.1 Executive summary 47
3.2 Case study 1: Social network and viral marketing 48
3.3 Case study 2: Social advertising on Facebook 52
3.4 Introduction to the empirical study 54
3.5 Product diffusion in social networks 55
3.6 Modelling diffusion in social networks 57
3.7 Model estimation 59
   3.7.1 Description of the data used: Very large-scale mobile network 59
   3.7.2 Description of the statistical method used: Survival analysis 60
3.8 Model results 62
   3.8.1 Non-parametric tests 62
   3.8.2 Variable definitions 63
   3.8.3 Model results: Impact of the social network on iPhone adoption 64
   3.8.4 iPhone virality over time 65
3.9 Discussion 67
References 68

4 Switching and churn in social networks 71
4.1 Executive summary 71
4.2 Case study: Customer retention in social networks 72
4.3 Introduction to the empirical study 75
4.4 Key findings from the switching cost literature 76
4.5 Modelling concept 78
4.6 Description of the data used: Another large-scale mobile network 79
4.7 Model results 81
   4.7.1 Non-parametric tests 81
   4.7.2 Variable definitions 81
   4.7.3 Model results: Impact of the social network on customer churn 83
   4.7.4 Robustness tests 85
4.8 Discussion 86
References 88
5 How social networks influence consumer choice of mobile phone carriers in the UK, Europe and Asia 91
  5.1 Executive summary 92
  5.2 Case study: Using homophily for social network marketing 93
    5.2.1 Mobile phone carriers 93
    5.2.2 Online retailers 95
    5.2.3 Online social networks 95
  5.3 Introduction to the empirical study 96
  5.4 Methodology 98
    5.4.1 Design of the social network survey 98
    5.4.2 Description of the statistical approach used: Quadratic assignment procedure 100
  5.5 Understanding the properties of the social networks 102
    5.5.1 Descriptive social network statistics 102
    5.5.2 Graphical analysis of a social network 106
  5.6 The impact of friendship on operator choice 108
  5.7 Robustness of results 112
    5.7.1 Non-respondents 112
    5.7.2 QAP and multicollinearity 114
    5.7.3 Ethnicity 116
  5.8 Are stronger relationships more influential? 117
  5.9 Friendship networks and choice of handset brand 120
  5.10 Multi-country case study of operator choice in social networks 122
    5.10.1 Malaysia 123
    5.10.2 The Netherlands 124
    5.10.3 Italy 127
    5.10.4 Cross-country comparison 132
  5.11 Discussion 133
  References 134

6 Coordination of mobile operator choice within households 137
  6.1 Executive summary 138
  6.2 Case study: Social network marketing to communities 138
    6.2.1 International communities 139
    6.2.2 Families 140
  6.3 Introduction to the empirical study 142
  6.4 Data 143
  6.5 Descriptive statistics 144
  6.6 The model 146
  6.7 Multinomial logit model 148
    6.7.1 Model parameters 148
    6.7.2 Base model 149
    6.7.3 Relationship types within households 152
  6.8 Multinomial probit model 153
    6.8.1 Independence of irrelevant alternatives 153
viii CONTENTS

6.8.2 Multinomial probit motivation 155
6.8.3 Estimation results 157
6.9 Discussion 158
References 158

7 How pricing strategy influences consumer behaviour in social networks 161
7.1 Executive summary 161
7.2 Case study: Pricing digital products with network effects 162
  7.2.1 Facebook 164
  7.2.2 LinkedIn 164
7.3 Introduction to the empirical study 165
7.4 The mobile telecommunications industry in the UK 167
7.5 The model: Price discrimination between on- and off-net calls 169
7.6 Estimation results: Adapting consumption choice to price signals 173
7.7 Discussion 175
References 176

8 Conclusions 177
8.1 Main results 177
8.2 Implications of interdependent consumer choice 178
  8.2.1 For marketing practitioners 178
  8.2.2 For academic researchers 179
  8.2.3 For regulatory policy 180
8.3 Looking ahead: How social network analysis is changing research and marketing practice 180
References 181

Appendix A Success factors for viral marketing campaigns 183
A.1 Proposition excellence 185
A.2 Observability of the product or its use 186
A.3 Design the campaign around a good understanding of the specific role of word-of-mouth in propagating your product 187
A.4 Word-of-mouth for economic benefit 187
A.5 Exploit storytelling and tap into the zeitgeist 188
A.6 Exploit influential expert users 189
A.7 Appeal to communities of interest 189
A.8 Conclusion 190
References 191

Appendix B Student questionnaire 193

Index 197