

Contents

Preface

xi

1 Subjective and Social Well-Being	1
1.1 Introduction	1
1.1.1 Subjective Well-Being	1
1.1.2 Objective Measures	2
1.1.3 Multidimensional Indicators	3
1.1.4 Surveys	4
1.1.5 Social Networking Sites and Data at Scale	4
1.1.6 What You'll Find (and What You'll Not) in This Book	6
1.1.7 Wellbeing, Well Being or Well-Being?	7
1.2 Gross Domestic Product	7
1.3 Well-Being as a Multidimensional Notion	11
1.3.1 The Capability Approach	11
1.3.1.1 Empirical Limitations of the Capability Approach	12
1.3.2 Multidimensional Well-Being Indicators	13
1.3.2.1 HDI: Human Development Index	14
1.3.2.2 BLI: Better Life Index	14
1.3.2.3 HPI: Happy Planet Index	15
1.3.2.4 BES: Benessere Equo Sostenibile (Fair Sustainable Well-Being)	15
1.3.2.5 CIW: Canadian Index of Well-Being	16
1.3.2.6 Other Initiatives for Measuring Well-Being	16
1.3.2.7 GNH: Gross National Happiness	17
1.3.2.8 Pros and Cons of Multidimensional Indicators	18
1.4 Self-Reported Well-Being	19
1.4.1 Gallup Surveys	19
1.4.1.1 Gallup World Poll	19
1.4.1.2 Gallup-Sharecare and Global Well-Being Index	21
1.4.1.3 Well-Being Research Based on Gallup Data	22
1.4.2 European Social Survey	23
1.4.3 World Values Survey	26
1.4.4 European Quality of Life Survey	26

1.4.5	How to Collect (and Interpret) Self-Reported Evaluations	27
1.5	Social Networking Sites and Well-Being	30
1.5.1	Sentiment Analysis	31
1.5.2	Evaluating Subjective Well-Being on the Web	32
1.5.3	Pros and Cons of Large-Scale Data from SNS	40
1.5.4	International and Intercultural Comparisons	43
1.6	Subjective or Social Well-Being?	44
1.7	Glossary	45
2	Text and Sentiment Analysis	47
2.1	Text Analysis	47
2.1.1	Main Principles of Text Analysis	48
2.2	Different Types of Estimation and Targets	50
2.3	From Texts to Numbers: How Computers Crunch Documents	51
2.3.1	Modeling the Data Coming for Social Networks	54
2.4	Review of Unsupervised Methods	55
2.4.1	Scoring Methods: Wordfish, Wordscores and LLS	55
2.4.2	Continuous Space Word Representation: Word2Vec	58
2.4.3	Cluster Analysis	61
2.4.4	Topic Models	62
2.5	Review of Machine Learning Methods	65
2.5.1	Decision Trees and Random Forests	66
2.5.2	Support Vector Machines	69
2.5.3	Artificial Neural Networks	73
2.6	Estimation of Aggregated Distribution	76
2.6.1	The Need of Aggregated Estimation: Reversing the Point of View	77
2.6.2	The ReadMe Solution to the Inverse Problem	79
2.7	The iSA Algorithm	79
2.7.1	Main Advantages of iSA over the ReadMe Approach	80
2.8	The iSAX Algorithm for Sequential Sampling	80
2.9	Empirical Comparison of Machine Learning Methods	81
2.9.1	Confidence Intervals	87
2.10	Conclusions	89
2.11	Glossary	89
3	Extracting Subjective Well-Being from Textual Data	91
3.1	From SNS Data to Subjective Well-Being Indexes	91
3.1.1	Pros & Cons of Twitter Data	91
3.2	The Hedonometer	93
3.3	The Gross National Happiness Index	94
3.4	The World Well-Being Project	95
3.5	The Twitter Subjective Well-Being Index	96
3.5.1	Qualitative Analysis of Texts	98

3.5.2	Data Filtering for Training-Set Construction	99
3.5.3	General Coding Rules	99
3.5.4	Specific Coding Rules	99
3.5.5	How to Construct the Index	105
3.5.6	The Data Collection	106
3.5.7	Some Cultural Elements of SNS Communication in Japan	107
3.6	Preliminary Analysis of the SWB-I & SWB-J Indexes	108
3.7	Cross-Country Analysis 2015–2018 with Structural Equation Modeling	111
3.7.1	Interpretation of the Structural Equation Model	112
3.8	Glossary	116
4	How to Control for Bias in Social Media	119
4.1	Representativeness and Selection Bias of Social Media	119
4.2	Small Area Estimation Method	121
4.2.1	Weighting Strategy	123
4.2.2	The Space-Time SAE Model with Weights	123
4.3	An Application to the Study of Well-Being at Work	125
4.3.1	Data and Variables	125
4.3.2	The Construction of the Weights	126
4.3.3	Official Statistics to Anchor the Model	127
4.3.4	Results of the SAE Model	130
4.3.5	A Weighted Measure of Well-Being at Work	131
4.3.6	The Estimated Measure of Well-Being at Work from the SAE Model	133
4.3.7	Comparison with Official Statistics	136
4.4	Conclusions	138
4.5	Glossary	138
5	Subjective Well-Being and the COVID-19 Pandemic	139
5.1	The Year 2020 and Well-Being	139
5.2	The Effect of Lockdown on Gross National Happiness Index	140
5.3	Hedonometer and the COVID-19 Pandemic	143
5.4	The World Well-Being Project and Tracking of Symptoms During the Pandemic	143
5.5	The Decline of SWB-I & SWB-J During COVID-19	145
5.5.1	Related Studies	149
5.6	Data Collection of Potential Determinants of the SBW Indexes	149
5.6.1	COVID-19 Spread Data	150
5.6.2	Financial Data	150
5.6.3	Air Quality Data	150
5.6.4	Google Search Data	150
5.6.5	Google Mobility Data	152
5.6.6	Facebook Survey Data	152

5.6.7	Restriction Measures Data	152
5.7	What Impacted the Subjective Well-Being Indexes?	153
5.7.1	Preliminary Correlation Analysis	154
5.7.2	Monthly Regression Analysis	154
5.7.3	Dynamic Elastic Net Analysis	161
5.7.4	Analysis of the Italian Data	163
5.7.5	Analysis of the Japanese Data	168
5.7.6	Comparative Analysis of the Dynamic Elastic Net Results	169
5.8	Structural Equation Modeling	170
5.8.1	Evidence from the Structural Equation Modeling	172
5.9	Summary of the Results	176
5.10	Conclusions	178
5.11	Glossary	179
Bibliography		181
Index		205