

Table of Contents

1 Introduction.....	1
1.1 Big data as technology: definition and origins.....	1
1.2 Personalisation, two-sided markets and the dominance of platforms.....	7
1.3 Big data as a source of risk for individuals.....	11
1.4 Big data and power relations: risks for society.....	12
1.5 Development of European data protection law, 1968-2018.....	16
1.6 Interaction between science, policy and law.....	20
1.7 Introducing the research question.....	23
1.7.1 Delineation.....	25
1.8 Methodology.....	26
1.8.1 Komesar's theory of Comparative Institutional Analysis.....	26
1.8.2 Barnett and Duvall's theory of power in social relations.....	28
1.8.3 Beck's theory of the risk society.....	29
1.8.4 Perrow's theory of normal accidents.....	30
1.8.5 Klinke and Renn's approach to risk evaluation and management.....	31
1.8.6 Complex systems science.....	32
1.9 Structure.....	32
2 Big data and consumer participation in privacy contracts.....	35
2.1 Introduction.....	36
2.1.1 Parliament steps in.....	37
2.1.2 Consumer participation options for privacy contracts.....	38
2.1.3 Consumer participation as a question of Institutional Choice.....	41
2.1.4 Comparative Institutional Analysis – Methodological notes.....	43
2.1.5 Structure of this chapter.....	44
2.2 How institutions matter for consumer privacy.....	44
2.3 Everything has a price: privacy analysis by cost and benefit.....	45
2.4 All created unequal: the catalogue of comparisons.....	47
2.5 National and European institutions compared.....	48
2.6 Privacy contracts at the national level.....	48
2.6.1 In the market.....	48
2.6.2 In the political process.....	50
2.6.3 In the national courts.....	52
2.6.4 Comparison at the national level.....	55
2.7 The market vs. the political process at the EU level.....	56
2.7.1 In the market.....	56
2.7.2 The political process.....	58
2.7.3 Comparison of the market and the political process at the EU level.....	61
2.8 Comparison between the national and EU levels.....	62
2.8.1 The market.....	62
2.8.2 The political process.....	62
2.9 Summary of institutional comparisons.....	63
2.10 Institutional choice and policy objectives.....	63

2.10.1 Two sets of European margins.....	64
2.11 Making a match.....	65
2.11.1 Maximizing privacy protection.....	66
2.11.2 Maximizing social or economic benefits.....	66
2.12 Concluding remarks.....	67
3 Beyond Consent.....	71
3.1 Introduction.....	72
3.2 How big data shifts power towards data controllers.....	75
3.3 Data and privacy protection law do not prevent the power shift.....	77
3.4 Consumer protection law can help shift power from data collectors to consumers.....	81
3.5 Conclusion: improve enforcement of consumer protection law.....	85
4 Rear view mirror, crystal ball.....	89
4.1 Introduction: Looking into a rear view mirror.....	90
4.2 Big data and the risk society.....	92
4.2.1 Risk society theory.....	92
4.2.2 Risk society and environmental law.....	94
4.2.3 Reflexive modernisation in action: The Seveso III-Directive.....	96
4.2.4 Big data and the risk society.....	97
4.3 Big data and normal accident theory.....	101
4.3.1 Normal accident theory.....	101
4.3.2 Normal accidents and Environmental law.....	104
4.3.3 Normal accident theory in action: again, the Seveso III-Directive.....	106
4.3.4 Big data and normal accidents.....	107
4.4 Application of Risk Society Theory and Normal Accident Theory in the GDPR.....	109
4.4.1 Risk management model of the GDPR.....	110
4.4.2 Identifying the underlying assumptions of the risk management model.....	111
4.4.3 Risk society theory in the GDPR.....	112
4.4.4 Normal accident theory.....	114
4.5 Looking into the crystal ball.....	117
4.6 In conclusion.....	120
5 Why the “Computer says no”.....	121
5.1 Introduction.....	122
5.2 Emergence as a fundamental property of complex systems.....	126
5.3 Exploring the risk of sensitive data.....	131
5.4 First example: Discovering protected traits in complex systems.....	136
5.4.1 Complex systems theory and the observation of emergence from non-sensitive personal data.....	137
5.4.2 Lawfulness of pattern recognition under the prohibition of article 9(1) GDPR.....	138
5.5 Second example: Discriminatory profiling in complex systems.....	141
5.5.1 Complex systems theory and discrimination through profiling.....	143
5.5.2 Lawfulness of profiling based on emergent properties under article 22 GDPR.....	144
5.6 Pattern recognition, profiling and the principles of processing.....	146
5.7 Potential remedies.....	152
5.8 Concluding remarks.....	157

6 In conclusion.....	161
6.1 Answering the research question.....	161
6.2 Discussion.....	164
6.3 Understanding big data better: considerations for future legislation.....	166
6.4 Broadening the knowledge base.....	171
6.5 Further research.....	173
7 Bibliography.....	175
8 Index of cases.....	199
9 Curriculum Vitae.....	201
10 Summary.....	203
11 Samenvatting (Summary in Dutch).....	207