

Contents

Preface	V
 List of Illustrations	XIII
 List of Infoboxes	XV
 List of Literature Analyses	XVII
I General Topics	1
1 Start: The meaning of credit	3
1.1 Credit – a disambiguation	3
1.2 Credit – an enhanced form of reciprocity	7
1.3 Credit – the tool for massive multilateral cooperation	9
2 Structure: The structure of credit contract theory	11
2.1 Purpose: Complexity control	11
2.2 Literature: Existing structures and their weaknesses	12
2.3 Modularisation: The PRE-layer-system	15
2.4 Modularisation: Implementation blackboxing	19
2.5 Modularisation: Enforcement modules	22
3 Specifications: The modules and their treatment in the literature	25
3.1 Lending Tools	25
3.2 The reciprocity agreement	32
3.3 The ability to repay	40
3.4 Purpose enforcement	46
3.5 Payback enforcement	53
3.6 Evaluation of credit contracts	66
3.7 Contracting	70
3.8 Further topics related to credit contract theory	82
4 Simplicity: The interplay of product layer modules	83
4.1 Contract: From loan terms to payoff distributions	84
4.2 Evaluation: From payoff distributions to preference relations	89
4.3 Contracting: From preference relations to market equilibria	92
4.4 Assembling and disconnecting modules	98

5	Standardisation: The standardisation of credit contract theory	103
5.1	Flows of value in a credit contract	103
5.2	Timelines and design principles	104
5.3	Payoff rules and redundancy in payoff functions	110
5.4	Symbols	112
II	Contributions to Selected Topics	117
6	Joint liability can cause adverse selection instead of resolving it	119
6.1	How group lending went from euphoria to disillusion	119
6.2	IL and JL contracts [reciprocity agreement]	120
6.3	Comparison of contracts [evaluation module]	122
6.4	Adverse selection [contracting module]	126
6.5	Conclusion: Joint liability can causes adverse selection	130
7	Collateralisation shifts risk towards borrower – A formal proof	131
7.1	Collateral and credit risk in the literature	131
7.2	Concepts: Risk, collateral, standard debt contracts	132
7.3	Calculating the transformed distribution	133
7.4	The risk-shift of collateralization	135
7.5	Implications on other lending modules	140
7.6	Summary and further research	142
8	Meaning of moral hazard is ambiguous – An improved definition	145
8.1	The necessity of well-defined concepts	145
8.2	Definitions in the literature and its shortcomings	146
8.3	A new definition that references the contract	147
9	An algorithm that can solve repayment games automatically	151
9.1	Motivation and development	151
9.2	Basic user manual	153
10	Perverse effect of joint liability vanishes with adaptive punishment	159
10.1	The perverse effect of joint liability	159
10.2	Countermeasures proposed in the literature	160
10.3	Adaptive penalty functions	161
10.4	Adaptive punishment in continuous games with larger groups	163
10.5	Comparison to punishment functions in the literature	163
10.6	Summary and discussion	166

11 Social sanctions coordinate and motivate	167
11.1 The difficulties in the model of Besley and Coate	167
11.2 The two components of social sanctions	169
11.3 The effect of social sanctions on joint liability lending	172
11.4 The effect of social sanctions on individual liability lending	175
11.5 Summary and further research	179
12 Cross-reporting can eliminate equilibrium punishment load	181
12.1 Combining repayment with a message	181
12.2 Cross-reporting and joint liability in [RS13]	181
12.3 Cross-reporting and joint liability in [RS04]	183
12.4 Cross-reporting and individual liability	187
12.5 Summary and future research	191
13 Outlook: Modularisation and standards improve research quality	193
13.1 Suggestion 1: Research sub-problems separately	194
13.2 Suggestion 2: Research modules comprehensively	195
13.3 Suggestion 3: Present results uniformly	196

III Appendix **199**

A Software code and documentation	201
A.1 General concepts	201
A.2 Code block: Game construction	204
A.3 Code block: Game solution	214
A.4 Code block: Game analysis	223
A.5 Code block: Game presentation	227
A.6 Code block: Game definition	232
A.7 Potential improvements	237
B Detailed solutions of repayment games	239
B.1 Individual liability	240
B.2 Joint liability – High punishment intensity	242
B.3 Joint liability – Adaptive punishment intensity	244
B.4 Joint liability – High punishment intensity (with social sanctions)	246
B.5 Joint liability – Medium punishment intensity	248
B.6 Joint liability – Medium punishment (with social sanctions)	250
B.7 Joint liability – Medium punishment (with social sanctions) [n=3]	252
B.8 Individual liability (with social sanctions)	254
B.9 Cross-reporting in [RS13] with original defect	256

B.10 Cross-reporting in [RS13] with corrected defect	258
B.11 Cross-reporting in [RS04]	260
B.12 Cross-reporting in [RS04] improved	262
B.13 Cross-reporting with individual liability	264
Bibliography	269