

Contents

<i>Contributors</i>	xiii
1. Introduction	1
<i>Chris Brummer</i>	
I. Cryptoasset Controversies	3
II. An Overview of This Volume	5
2. Cryptocurrencies and the Evolution of Banking, Money, and Payments	11
<i>Benjamin Geva</i>	
I. Introduction	11
II. Money, Payment and Payment Intermediation	12
III. Deposit Banking, Payment Services, and Paper Money: Historical Perspective on Payments Intermediation	14
A. Antiquity	15
B. Middle Ages	18
C. Post-Medieval Era	20
IV. The Coming of the Cyber-Age: Electronic Payments, E-money, and Access to Central Bank Balances	24
A. The Advent of Electronic Banking and E-money	24
B. Availability of Central Bank Account Balances and Their Equivalents to the Public	27
V. Cryptocurrencies: Heralding a New Form of Money and Payment Disintermediation?	30
VI. Conclusion	36
3. Deconstructing “Decentralization”: Exploring the Core Claim of Crypto Systems	39
<i>Angela Walch</i>	
I. Mainstream Discourse around “Decentralized” Permissionless Blockchains	41
II. The Complex Nature of “Decentralization”	47
Notable Themes	47
A. No One Knows What “Decentralization” Means	47
B. Satoshi Didn’t Invent Decentralization	48
C. Decentralized Does Not Equal Distributed	49
D. Decentralization Exists on a Spectrum	49

E. Decentralization Is Dynamic rather than Static	50
F. Decentralization Is Aspirational, Not Actual	50
G. Decentralization Can Be Used to Hide Power or Enable Rule-Breaking	51
H. Calls to Action	51
III. Examples of Concentrations of Power in Permissionless Blockchain Systems	52
A. Critical Bug Discovery and Fix in Bitcoin Software in Fall 2018	53
B. Bitcoin's March 2013 Hard Fork	54
C. Secret Meetings of Ethereum Core Developers in Fall 2018	55
D. Ethereum's July 2016 Hard Fork	56
E. Hashing Power Concentration and 51% Attacks	57
IV. Using "Decentralized" to Make Legal Decisions about Blockchains	58
A. Decentralization's Uncertain Meaning Makes It Ill-Suited for a Legal Standard	58
B. Decentralization's Dynamic Nature Complicates Its Use as a Legal Standard	60
C. If Actual Decentralization Is Now Just a Dream, Wait Till It Comes True	61
D. Decentralization Veils and Malleable Tokens	61
1. Who Needs an Entity When You've Got a Veil of Decentralization?	62
2. If People Wield Unnoticed Power, Tokens Are Unexpectedly Malleable	65
V. Closing Reflections	67
4. Cryptoasset Valuation: Theory and Practice	69
<i>Nic Carter</i>	
I. Introduction	69
II. Disaggregating Cryptoassets by Value Drivers	70
A. Unique Access to Network Services	71
B. Asset-Backed Cryptoassets	73
C. Cash Flows from an Underlying Network	74
D. Consumability	75
E. Governance Rights	75
III. Case Studies	77
A. Bitcoin and Its Peers	77
1. Valuation with the Equation of Exchange	78
2. Relative Network Usage Models	80
3. Competing Models of Price-Hashrate Dynamics	81
4. The Cost of Production Is a Determinant in the Value of the Token	82
5. Hashrate Follows Price	82
6. Joint Determination	83

B. MakerDAO	84
C. Binance Coin	86
D. 0x	87
IV. Conclusion	87
5. Toward a Stable Tokenized Medium of Exchange	89
<i>Alexander Lipton</i>	
I. Introduction	89
II. The Banking System	91
A. Overview	91
B. Money	91
C. Credit Money Creation and Annihilation	93
D. Bookkeeping and Transactions	94
E. Domestic and Foreign Payments	95
F. What Is Wrong with the Current Setup?	95
III. Distributed Ledgers	96
A. General Considerations	96
B. Types of Distributed Ledgers	98
C. Cryptocurrency Creation and Transactions	98
D. What Is Wrong with the Current Setup?	99
IV. Stablecoins and Their Taxonomy	100
A. Overview	100
B. Coins Fully Collateralized with Fiat	101
C. Coins Partially Collateralized with Fiat	102
D. Coins Overcollateralized with Cryptos	103
E. Dynamically Stabilized Coins	104
F. Coins Collateralized with Assets	105
G. Narrow Banks as Emitters of Digital Cash	107
H. Mixing and Tumbling	109
I. KYC and AML Considerations	110
J. Privacy	110
V. Conclusions	110
VI. Glossary	111
VII. References	112
6. The Law and Finance of Initial Coin Offerings	117
<i>Aurelio Gurrea-Martínez and Nydia Remolina León</i>	
I. Concept, Features, and Structure of ICOs	118
A. Tokens	119
1. The Concept and Features of Tokens	119
2. The Presale of Tokens	121
3. The Crowdsale and Distribution of Tokens to the Public	122
B. Cryptocurrencies as ICO Proceeds	123
C. Blockchain: The Technology behind Initial Coin Offerings	124

D. The White Paper	124
E. Differences between ICOs and Other Methods to Raise Capital	125
II. Regulatory Approaches to Deal with ICOs	129
A. Existing Regulatory Approaches	129
1. Contractual Approach	129
2. Bans	130
3. Security Token Registration	132
4. Comprehensive Token Registration	134
B. Toward a Safe but Efficient System of ICO Oversight	135
III. Accounting and Finance Aspects of ICOs	136
IV. Corporate Governance Issues	139
A. The Concept and Nature of Tokenholders	139
B. Protecting Tokenholders from the Promoter's Opportunism	141
1. Agency Problems in a World of Tokenholders	141
2. Legal Strategies to Protect Tokenholders	143
3. Market Devices to Protect Tokenholders	145
V. Anti-money Laundering Implications of ICOs	146
VI. New Challenges for Privacy Law and Data Protection	148
VII. Insolvency	149
VIII. International Challenges and Cooperation in ICOs	151
IX. Future of Capital Markets, Finance, and Corporate Governance in a World of Tokenized Securities	153
X. Conclusion	155
7. What Should Be Disclosed in an Initial Coin Offering?	157
<i>Chris Brummer, Trevor I. Kiviat, and Jai Massari</i>	
I. Introduction	157
II. ICOs: The Shot-in-the-Dark Investment Decision	159
III. Crypto-Economics and Token Pricing	162
A. Demand-Side Factors	164
B. Supply-Side Factors	165
IV. White Papers as Disclosure Documents	167
V. ICO Disclosure Models: The Logic, Forms and Limitations	169
A. The "Full" Disclosure Model	170
1. Financial Statements	171
2. Description of Token	172
3. Blockchain Governance	174
4. Management and Technology Team	175
5. Secondary Trading	176
6. Risk Factors	177
B. Scaled Disclosure Regimes	179
1. Crowdfunding/Rule 4(a)(6)	179
2. Reg A+	182
3. Private Offerings	183

VI. Beyond Disclosure: “Plain English” Requirements and Third-Party Validators	184
VII. Conclusion	187
8. Blockchains and Risk Management Infrastructure of the Derivatives Industry	203
<i>Petal P. Walker</i>	
I. What’s a Swap?—A Look at a Basic Transaction	203
A. An Overview of Registration Obligations	204
II. How Blockchain Technology Would Transform Derivatives Markets	206
III. The Risks and Rewards of Blockchain Technology	208
A. Newfound Transparency, Supervisory Potential for Regulators	208
B. Common Risk Concerns Raised	209
1. Language Gap Risk	209
2. Technology Risk	211
3. Permanency Risk	211
4. Transparency Risk	212
IV. The Risks and Rewards of Registration	212
A. The Blockchain Network	212
B. The Smart Contract Writer	214
C. The Contract	216
D. Oracles, Nodes, and Validators	217
V. Conclusion	217
9. Difficulties in Achieving Neutrality and Other Challenges in Taxing Cryptoassets	219
<i>Christophe Waerzeggers and Irving Aw</i>	
I. Introduction	219
II. Challenges in Classification and the Problem of Hybridity	220
A. Money or Property	221
B. Securities Tokens	225
C. Asset-Backed Tokens or Stable Coins	227
III. Taxing Increases in Value of Cryptoassets and Other Specific Transactions	228
A. Disposal Gains	228
B. Mining and Forging	230
1. Proof-of-Work	230
2. Proof-of-Stake	233
C. Token Airdrops	234
D. Hard Forks	236
E. Employment Remuneration	237
F. Token Pre-financing	238

G. Token Burning	239
IV. Conclusion	241
10. Blockchain and Identity Persistence	243
<i>Alex Marthews and Catherine Tucker</i>	
I. Introduction and Definitions	243
II. Blockchain	243
A. What Is Blockchain Technology?	243
B. What Is the Current State of the Art of Protecting Privacy on Blockchain?	244
III. Digital Identity	246
IV. Legal Identity and Smart Contracts	247
V. Narrative Identity	250
A. Resolving Incompatibilities between Narrative Identity and Blockchain Records	251
VI. Use-Cases	252
A. Marriage on the Blockchain	253
B. Money Laundering on the Blockchain	254
C. Criminal Justice Records on the Blockchain	256
VII. Decentralized Identifiers and Verified Claims	257
VIII. Conclusions	258
References	259
11. Policy and Regulatory Challenges of Distributed Ledger Technology and Digital Assets in Asia	263
<i>Douglas Arner, Ross P. Buckley, Dirk Zetsche, Bo Zhao, Anton N. Didenko, Cyn-Young Park, and Emilija Pashoska</i>	
I. Introduction	263
A. DLT, Blockchain, and Cryptocurrencies in Asia	264
B. Recent Developments and Policy Responses	267
II. DLT and its Applications: Evolution and Typology	272
A. Centralized and Distributed Ledgers	272
B. Permissioned and Permissionless Systems	274
C. Blockchain	274
D. Technology-Based Trust Solutions	275
E. Smart Contracts	276
F. DLT Use Cases and Investment Trends	276
III. Cryptocurrencies	278
A. Non-Sovereign: Alternative Currencies and Payment Systems	278
B. Alternative Currencies: Legal Status and Regulatory Implications	280
C. Sovereign Digital Currencies and Cryptocurrencies	281
D. Central Bank P2P/Intermediated Payment Systems	282
E. Sovereign (Central Bank) Cryptocurrencies	282
1. Benefits, Opportunities, and Risks	285
2. Benefits and Opportunities	286

3. Challenges	286
IV. Initial Coin Offerings and Tokenization	288
A. ICO Typology	288
B. ICOs in Asia	289
C. Regulation of ICOs in Asia	293
1. Outright Ban	293
2. Regulatory Warnings	293
3. Application of Existing Securities and Investment Product Laws	294
4. Is DLT the Problem?	294
V. DLT: Risks and Concerns	294
A. Transparency Risks	294
B. Cyber Risks	295
C. Operational Risks	295
D. Blockchain-Specific Risks	296
VI. Policy Issues and Challenges: Devising Appropriate Regulatory Responses to DLT	296
A. International Regulatory Context	296
B. A Functional Proportional Approach Balancing Risks and Opportunities	297
C. Core Strategy and the Role of International Regulatory Cooperation	298
Appendix: Regulatory Statements in Asia	299
12. Casting Light on Central Bank Digital Currency	307
<i>Tommaso Mancini-Griffoli, Maria Soledad Martinez Peria, Itai Agur, Anil Ari, John Kiff, Adina Popescu, and Céline Rochon with contributions from Fabio Comelli, Federico Grinberg, Ashraf Khan, and Kristel Poh</i>	
I. Basics of Central Bank Digital Currency	309
II. A Conceptual Framework to Compare Different Forms of Money	310
III. Is There a Role for CBDC? User Perspective	315
IV. Is There a Role for CBDC? Central Bank Perspective	317
A. Social Criteria for Money	317
B. Can CBDC Balance Privacy and Financial Integrity Concerns?	321
C. Would CBDC Undermine Financial Stability and Banking Intermediation?	322
1. Scenario 1: Risk of Disintermediation in Tranquil Times	322
2. Scenario 2: Run Risk in Times of Systemic Financial Stress	325
D. Would Monetary Policy Transmission Remain Effective?	326
V. Central Bank Research and Experiments	327
VI. Conclusion	331
References	332
Appendix	338
Notes	341
Index	429