

# CONTENTS

<i>Table of Cases</i>	xvii
<i>Table of Legislation</i>	xxv
<i>Notes on Contributors</i>	xxxiii

## 1. Cryptocurrencies: The Underlying Technology

I. Introduction	1.01
II. Decentralization and Distributed Consensus	1.02
III. The Chapter Contributions to this Book	1.11

## 2. It's Virtually Money

I. Introduction	2.01
A. What are virtual currencies and why do they present such challenges to existing categories?	2.03
B. Universal medium of exchange	2.15
C. Unit of account	2.19
D. Store of value	2.20
E. A peculiarly private law concept of 'money'	2.22
F. Consequences of a failure to recognize virtual currency as money	2.26
1. Barter rather than sale	2.26
2. Applicability of the bona fide purchaser for value defence	2.44
II. Conclusion	2.48

## 3. Cryptocurrencies in International and Public Law Conceptions of Money

I. Introduction	3.01
II. Theories of Money	3.05
III. Nature of Cryptocurrencies	3.09
IV. International Law	3.16
V. Public Law	3.24
VI. Criminal Law	3.27
A. Theft and fraud	3.28
B. Cryptocurrencies and money laundering	3.32
C. Financial markets legislation	3.34

VII. The Central Bank	3.44
A. Financial stability	3.46
B. Monetary policy	3.55
VIII. Conclusions	3.58
<b>4. Developing the Right Regulatory Regime for Cryptocurrencies and other Value Data</b>	
I. Introduction	4.01
A. Scope	4.01
B. Thesis	4.04
C. Structure	4.05
II. Asset and Manifestation: Substance and Form of Monetary Value over the Course of Time	4.06
A. Banknotes	4.06
1. Redeemable banknotes	4.06
2. Irredeemable banknotes	4.12
B. Central bank reserve balances	4.20
1. Initially: claims to payment of legal tender	4.22
2. Later: legal tender in the form of non-convertible sight deposits (fiat money)	4.27
C. Interim conclusion	4.35
III. Modes of Creation of Money and Their Effects on the Substance of an Asset	4.47
A. Temporary money: created on a temporary basis	4.48
B. Outright money: created with no connected reversal event	4.51
C. Helicopter money	4.56
IV. Types of Manifestation and Their Effects on Legal Title, Transfer, and Protection of Commercial Dealings	4.60
A. Manifestation by possession	4.63
B. Manifestation by oral or written but uncertificated consent	4.64
C. Manifestation by certificated security	4.65
D. Manifestation by money	4.66
E. Manifestation by intermediated security	4.71
F. Manifestation by entry in a register kept by a trusted party	4.76
V. Conclusion: Manifestation of Value Data by Entry in a Register Kept by a Trusted Technology	4.80
A. Value data: the rivalrous and excludable	4.80
B. Book entries secured by elliptic cryptography	4.83
C. Legal consequences and recent legislative developments	4.87
1. Static dimension: legal title	4.87
2. Dynamic dimension: mode of transfer	4.94
D. Closing remark	4.100

<b>5. Cryptocurrencies and the Conflict of Laws</b>	
I. Introduction	5.01
A. Virtual currencies and cryptocurrencies in outline	5.01
B. The conflict of laws in outline	5.04
C. Regulatory challenges for the conflict of laws	5.07
II. The Law Applicable to the Relationships between Participants within a Cryptocurrency System	5.15
A. Introduction	5.15
B. Key features of the Bitcoin and Ripple cryptocurrency systems	5.18
1. Bitcoin	5.18
2. Ripple	5.23
C. Conflict of laws characterization of the relationships between participants in cryptocurrency systems	5.27
D. The law applicable to relationships between participants in cryptocurrency systems	5.35
1. Choice of the applicable law (Article 3)	5.36
a) The Rome I Regulation: choice of national law	5.36
b) Possible future alternatives to choice of national law	5.39
2. Law applicable in the absence of choice (Article 4)	5.44
a) Temporal application of the Rome I Regulation	5.45
b) Particular categories of contract (Article 4(1)) and characteristic performance (Article 4(2))	5.49
c) The closest connection test (Article 4(4))	5.62
d) Does a tenuous connection to the country of closest connection suffice?	5.65
3. Other issues	5.68
E. Reflection	5.72
III. Cryptocurrencies as ‘Money’ in the Conflict of Laws	5.73
A. Cryptocurrencies and the ‘ <i>lex monetæ</i> ’	5.73
B. Illegality of transactions involving cryptocurrencies	5.81
C. Judgments in a cryptocurrency	5.89
IV. Cryptocurrencies as ‘Property’ in the Conflict of Laws	5.93
A. Introduction	5.93
B. The proprietary character of cryptocurrencies	5.96
C. The law applicable to assignments of claims under the Rome I Regulation	5.103
D. Beyond legal rights: the law applicable outside the Rome I Regulation	5.106
V. Conclusions	5.121
<b>6. Cryptocurrencies in the Common Law of Property</b>	
I. Introduction	6.01
A. Approach and terminology	6.08

II. A Crypto-Coin as an Object of Property	6.11
A. Data strings recording transactions	6.12
B. Fungibility, specificity, scarcity, and exclusion	6.20
1. Fungibility as an aim of cryptocurrency design	6.20
2. Fungibility and specificity in property law	6.21
3. Cryptocurrencies as either fungible or specific in law	6.25
4. Scarcity and exclusivity	6.26
C. Crypto-coins in the law of personal property	6.28
1. Choses in possession and choses in action	6.28
2. Intangible personal property other than choses in action	6.32
3. The current authorities	6.38
III. Rules of Title and Transfer	6.45
A. General	6.45
B. Derivative transfers of title	6.48
1. General	6.48
2. Legal title and the blockchain record	6.49
3. The blockchain record as presumptive evidence of title	6.50
4. Derivative transfers of title and tracing	6.53
5. Purchase for value in good faith	6.57
IV. Mixture, Following, and Tracing	6.67
A. Mixtures of cryptocurrencies	6.67
1. Mixing in practice	6.69
B. Tracing and cryptocurrencies	6.74
1. Cryptocurrencies are traced not followed	6.75
2. The blockchain and traceability	6.76
3. Pseudonymity and tracing	6.78
C. Attribution in cryptocurrency transactions	6.79
1. Attribution by the blockchain record or by an external transaction	6.79
D. Tracing through mixtures	6.81
1. Balances and transactional outputs	6.81
E. Cryptographic and legal rules for tracing through mixtures	6.83
1. The poison approach: a punitive causation rule	6.84
2. The haircut approach: proportionate division	6.86
3. The first-in-first-out approach: <i>Clayton's Case</i>	6.88
4. Variations from <i>Clayton's Case</i>	6.93
F. Notice in cryptocurrency payments	6.97
V. Remedies	6.101
A. Common law remedies	6.102
B. Equitable remedies	6.105
VI. Conclusion	6.107
7. Cryptocurrencies as Property in Civilian and Mixed Legal Systems	
I. Introduction	7.01

II. Cryptocurrencies as <i>Res</i>	7.05
A. What is a unit of cryptocurrency?	7.06
B. Fixed lists or <i>numerus clausus</i>	7.09
C. Possession?	7.15
D. Specificity	7.16
E. Publicity	7.18
F. Analogical addendum	7.21
III. Implications of Recognizing Cryptocurrencies as <i>Res</i>	7.23
A. 'Ownership'?	7.24
B. Vindication and possessory actions	7.26
1. Vindication	7.26
2. Possessory actions	7.29
C. Acquisitive prescription and original acquisition	7.31
1. Mixtures, specification, and occupation	7.32
2. Acquisitive prescription	7.34
IV. Conclusion	7.36
<b>8. The Characterization of Cryptocurrencies in East Asia</b>	
I. Introduction	8.01
II. Cryptocurrencies: Reinventing Money?	8.02
III. The Roman-Germanic Terrain of East Asian Civil Law	8.06
IV. The Unbearable Strictness of Owning?	8.10
A. A fundamental distinction: ownership and its objects	8.10
B. The objects of ownership in East Asia	8.12
C. Cryptocurrencies as objects of ownership?	8.16
V. Real Rights without Tangible Objects: Quasi-Real Rights?	8.22
A. <i>Rei vindicatio</i>	8.28
B. Damages under tort law	8.31
C. Electing between remedies	8.33
VI. Conclusion	8.34
VII. Postscript	8.35
<b>9. Cryptocurrencies and Banking Law: Are there Lessons to Learn?</b>	
I. Introduction	9.01
II. The Cryptocurrency as a Store of Value	9.04
A. The duty to act within mandate	9.13
B. The duty of secrecy	9.16
C. The duty to act with reasonable skill and care	9.18
D. Fiduciary duties	9.20
III. The Cryptocurrency as Payment	9.21

IV. The Cryptocurrency as a Basis for Lending	9.26
V. Conclusion	9.27
<b>10. Taxation of Cryptocurrencies</b>	
I. Background	10.01
A. Direct taxes	10.13
B. Value-added taxes	10.16
II. International Approaches	10.18
A. Cryptocurrencies as property	10.18
1. United States	10.18
2. Australia: income tax and capital gains tax	10.38
3. Other countries	10.49
a) Singapore	10.51
b) France	10.54
c) Israel	10.57
d) The UK	10.59
B. Cryptocurrencies as currency	10.62
1. Australia: goods and services tax—supplies of cryptocurrencies	10.63
2. European VAT	10.68
3. UK VAT	10.74
4. UK corporation tax	10.82
5. UK business tax	10.85
6. Switzerland	10.86
C. Other approaches	10.90
III. Consideration of the Tax Treatment of Cryptocurrencies	10.98
A. Equality	10.100
B. Efficiency, convenience, and certainty	10.112
IV. Conclusions	10.121
<b>11. Non-State Community Virtual Currencies</b>	
I. Introduction: What Is Digital Community Currency?	11.01
II. Legal Tender and Money	11.08
III. Exchange, Community, and Money: Chicken and Egg?	11.17
IV. How Far Ought Acceptance Be Free? Lessons from History	11.26
V. Does Digitization Change the Meaning of a ‘Monetary’ Community?	11.33
VI. Privately Issued Money: Does Law Converge with Economic Sociology?	11.41

*Contents*

---

VII. Is the Banknote Unique? The Reach of Its Legal History	11.46
VIII. Do Cryptocurrencies Constitute 'Money'?	11.54
IX. Does Community Money Bring Net Benefits? A Brief Overview	11.61
X. Conclusion and Final Observations	11.66
<i>Index</i>	307