

Modern Economic Regulation

Second Edition

Economic regulation affects us all, shaping how we access essential services such as water, energy and transport services, as well as how we communicate with one another in the digital world. *Modern Economic Regulation* describes the core insights of economic theory on which regulatory policies are based and connects this with evidence of how regulation is applied. It focuses on fundamental questions such as: Why are certain industries regulated? What principles can inform regulation? How is regulation implemented? Which regulatory policies have been more, or less, effective in practice? All chapters in this second edition are fully updated to reflect the latest research and evidence, while five new chapters cover behavioural economics and the regulation of rail, aviation, payment systems and digital platforms. Each chapter contains discussion questions and topical case studies, and online materials include over 60 applied exercises that explore real-life regulatory problems from around the world.

Dr Christopher Decker is a research fellow specialising in regulatory and competition economics at the Centre for Socio-Legal Studies in the University of Oxford. He has extensive experience of the application of economic regulation across a range of industries (energy, water, telecommunications, transport, digital markets, payments and financial services) and has advised international bodies (the World Bank, OECD, European Commission, APEC), as well as government departments, regulators and private companies in many parts of the world.

Cambridge University Press & Assessment
978-1-316-51451-1 — Modern Economic Regulation
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Modern Economic Regulation

An Introduction to Theory and Practice

Second Edition

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Cambridge University Press is part of Cambridge University Press & Assessment, a department of the University of Cambridge.

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www.cambridge.org
Information on this title: www.cambridge.org/highereducation/isbn/9781316514511
DOI: 10.1017/9781009083621

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Second edition © Christopher Decker 2023

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First published 2015

Second edition 2023

Printed in the United Kingdom by TJ Books Limited, Padstow, Cornwall 2023

A catalogue record for this publication is available from the British Library.

Library of Congress Cataloging-in-Publication Data

Names: Decker, Christopher, 1972–author.

Title: Modern economic regulation : an introduction to theory and practice / Christopher Decker.

Description: Second edition. | New York, NY : Cambridge university Press, [2023] | Revised edition of the author's Modern economic regulation, 2015. | Includes bibliographical references and index.

Identifiers: LCCN 2023011817 | ISBN 9781316514511 (hardback) | ISBN 9781009087735 (paperback) | ISBN 9781009083621 (ebook)

Subjects: LCSH: Public utilities–Government policy. | Public utilities–Economic aspects.

Classification: LCC HD2763 .D36 2023 | DDC 363.6–dc23/eng/20230313

LC record available at <https://lcn.loc.gov/2023011817>

ISBN 978-1-316-51451-1 Hardback

ISBN 978-1-009-08773-5 Paperback

Additional resources for this publication at www.cambridge.org/decker2

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Preface to the Second Edition

Economic regulation is not static in theory or practice. Policy objectives change, new products, technologies and business models emerge, and regulation adapts to reflect changing consumer and societal preferences. Academic research also throws up fresh perspectives from which to examine old questions or address pressing policy concerns. In the eight years since the publication of the first edition of this book, a range of new issues have come to the fore, notably the impacts on economic regulation of digitalisation, decentralisation and decarbonisation policies. Debates have emerged on whether economic regulation should be applied to new industries, and whether it should be withdrawn, or reduced in scope, from activities where competition has developed. There is also increasing focus on how consumers actually make decisions, and on the consumer ‘outcomes’ (in terms of price and quality of service) associated with different regulatory approaches and restructuring policies.

Accordingly, this second edition has been comprehensively updated to incorporate the latest research, and to focus on the most contemporary issues in economic regulation. The main structural changes include the following.

- **Five new substantive chapters.** These cover topical issues such as: behavioural economics; the need for and approach to regulation of large digital platforms (such as Google, Amazon, Meta); and payment systems (interchange fee) regulation. The book also includes two new chapters on the regulation of railways and of aviation.
- **Discussion questions at the end of each chapter and supplementary online resources.** These are intended to cement the reader’s understanding of the most important themes and insights from each chapter. The questions and online resources are also designed to be thought-provoking and to encourage students to offer their opinions on important regulatory debates, or to identify possible challenges in applying theory in practice.
- **New topic boxes that connect theory and practice in the industry chapters.** The discussion in the boxes in Chapters 9 to 16 have been updated to reflect new and topical issues in each industry.
- **New references.** The book contains hundreds of new references to the latest theoretical research and practical evidence on the effects of regulation in practice.

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Major thematic, cross-cutting changes to the book include incorporating discussions on:

- **behavioural economics research**, including the main insights from behavioural industrial organisation that impact on the rationales for and approach to economic regulation, and also how such insights are being applied by regulators in practice across a range of regulated industries;
- **affordability and fairness concerns**, which are increasingly prominent in many jurisdictions, including a discussion of rationales for regulation based on the characteristics of the consumer, and the factors that have led to the re-introduction of price regulation in competitive markets in some jurisdictions;
- **the impacts of technological change and digitalisation on regulation**, including the implications of new business models and service providers such as overlay service providers in payment systems, over-the-top providers in communications and competitive unmanned aircraft system (drone) traffic management providers in aviation;
- **the impacts of decarbonisation and ‘net-zero’ policies on regulation**, which is of particular relevance in the electricity, gas, water and transport industries;
- **the implications of the shift from centralised networks to decentralised (distributed) networks** in sectors such as communications, energy and air transport, and the implications this has for the regulatory architecture;
- **network effects as a rationale for regulation** and how this is influencing the debates about the need to regulate digital platforms, payment systems and transport networks;
- **approaches to the regulation of multi-sided markets**, including payment systems, digital platforms and peer-to-peer platforms in energy and transport;
- **new forms of price regulation**, including the total expenditure approach, which has recently been introduced in the UK, in Australia and in some parts of Europe;
- **how to manage the declining use of some traditional network services**, such as fixed line calls and grid-supplied electricity, and the implications of such decline for legacy costs recovery, price structures and universal access;
- **different governance, ownership and financing models**, including co-regulation and principles-based regulation, the use of not-for-profit or community schemes in energy and for broadband, and the competitive/merchant investment model in water and energy;
- **the factors motivating reverse privatisation or re-municipalisation** in some sectors and jurisdictions; and
- **new laws, regulations and policy developments in all industry sectors**, for example, to reflect new Regulations and Directives in the EU, and new regulatory policies in North America and elsewhere in the world.

At the same time, this second edition updates the discussions on the most important enduring issues in regulation. This includes new research and evidence on: the effects of introducing competition in essential public utility industries; the pros and cons of vertical and horizontal separation; whether private or state ownership is more efficient in reducing costs, improving performance and widening access to essential services; the effectiveness of different forms of price regulation, including the impacts on the incentives to invest and innovate; and the merits of various alternative approaches to economic

regulation, such as those based around direct negotiation and agreement between firms and consumer representatives.

Although there have been important changes to this second edition, the overarching aim is the same as the first edition: to provide an accessible textbook that connects the vast, and continually expanding, theoretical literature on economic regulation with the real-world experience of applying such regulation in practice – to bring economic regulation to life.

The scope of the material covered, and the level of accessibility of the book, are intended to appeal to a wide and multi-disciplinary audience with no prior background in economics or regulation. The text is written in such a way that it should appeal to three main audiences: students who want to develop an understanding of the key concepts and foundational principles of economic regulation and understand how such principles are applied in practice; academics and researchers who want to keep abreast of the latest research, or who may be familiar with one area of regulation but want to understand how regulation is applied in other areas; and practitioners and regulators who want to gain insights about how regulation has been applied in other sectors and jurisdictions, or understand the key principles that influence the development of regulatory policy.

Acknowledgements

A book like this is a collaborative effort built on the work of many people, and this second edition has benefited greatly from the insights provided by readers of the first edition. I am particularly grateful to the scholars, practitioners and students from around the world who got in touch to provide positive feedback on the first edition and to discuss new ideas, to suggest new papers or to provide examples of regulatory practice in their own countries.

I am also grateful for the constructive suggestions of five anonymous reviewers whose feedback has been immensely valuable in revising the text and in drawing my attention to areas where the exposition could be improved, and on substantive topics that should be addressed.

A final word of thanks to all those who have contributed to the individual research described in these pages. Some authors have continually (and impressively!) generated valuable research and insights throughout the entire 'modern' period of regulation, while others have provided deep and novel insights in specific areas of regulation. While these scholars have provided the raw materials on which this book is based, a separate thanks must go to those who have helped me to fashion those materials into something that resembles a book. Here my enduring thanks must go to the team at Cambridge University Press and to my wife, Felicity, whose tremendous patience and skill has helped me turn technical prose into something accessible to a wide audience.

List of Selected Acronyms and Abbreviations

2G	second generation (of mobile communications technology)
3G	third generation (of mobile communications technology)
4G	fourth generation (of mobile communications technology)
5G	fifth generation (of mobile communications technology)
AATF	Airport and Airway Trust Fund
ACCC	Australian Competition and Consumer Commission
ACER	Agency for the Cooperation of Energy Regulators
ADSL	Asymmetric Digital Subscriber Line
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AIP	Airport Improvement grant Program
AISP	account information service provider
A–J	Averch–Johnson (effect)
ANS	air navigation services
ANSP	air navigation service provider
APA	Administrative Procedures Act 1946
ARCEP	l'Autorité de Régulation des Communications Électroniques et des Postes (telecommunications and post regulator, France)
ARROW	(costs) that are avoided or reduced or recoverable in some other way
ASEAN	Association of Southeast Asian Nations
ATM	air traffic management
AUC	Alberta Utilities Commission
BEREC	Body of European Regulators for Electronic Communications
BOT	build–operate–transfer
BT	British Telecom
BU-LRIC	bottom-up long-run incremental cost
CAB	Civil Aeronautics Board
CAPM	capital asset pricing model

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CARD	Credit Card Accountability Responsibility and Disclosure Act (USA)
CAT	Competition Appeal Tribunal (UK)
CATO	Competitively Appointed Transmission Owner
CBDC	central bank digital currency
CCS	carbon capture and storage
CEER	Council of European Energy Regulators
CEGB	Central Electricity Generating Board (England and Wales)
CEGH	Central European Gas Hub
CER	Canadian Energy Regulator
CFC	chlorofluorocarbon
CFPB	Consumer Financial Protection Bureau (USA)
CIS	Capital expenditure Incentive Scheme (water, UK)
CIS	common information service (provider, in aviation)
CLEC	competitive local exchange carrier
CMA	Competition and Markets Authority (UK)
C-MeX	customer measure of experience
CO ₂	carbon dioxide
CPI	consumer price index
CPNP	calling party network pays
CPUC	California Public Utilities Commission
CRTC	Canadian Radio-Television Telecommunications Commission
CS	consumer surplus
DCF	discounted cash flow (model)
DEA	data envelopment analysis
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
D-Mex	developer services measure of experience
DOCSIS	Data Over Cable Service Interface Specification
DoJ	Department of Justice (USA)
DORC	depreciated optimised replacement cost
DSAC	distributed stand-alone cost
DSL	Digital Subscriber Line
DSO	distribution system operator
DWI	Drinking Water Inspectorate (England and Wales)
EC	European Community; European Commission
ECPR	efficient component pricing rule
EEA	European Environment Agency
EEA	European Economic Association
EIA	Energy Information Administration (USA)

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ENTSO	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
EPA	Environmental Protection Authority (USA)
EPEX	European Power Exchange
EPMU	equi-proportionate mark-up
ERCOT	Electric Reliability Council of Texas
ERG	European Regulators Group (for telecommunications)
ERT	economic replicability test
ESP	electricity service provider
ETS	emissions trading scheme
EU	European Union
EV	electric vehicle
EXAA	European Energy Exchange
FAA	Federal Aviation Administration
FAC	fully allocated cost
FCC	Federal Communications Commission (USA)
FCM	financial capital maintenance
FDC	fully distributed costs
FERC	Federal Energy Regulatory Commission (USA)
FIMS	flight information management system
FIR	Flight Information Regions
FIT	feed-in tariff
FORR	final offer rate review
FTC	Federal Trade Commission (USA)
FTM	fixed-to-mobile (access)
FTR	financial transmission right
FTTB	fibre to the basement/building
FTTC	fibre to the cabinet/curb (kerb)
FTTH	fibre to the home
FTTN	fibre to the node
FTTx	fibre to the x (premises)
GAO	Government Accountability Office (USA)
GDP	gross domestic product
GECPR	generalised efficient component pricing rule
GME	Gestore dei Mercati Energetici (Italian Power Exchange)
GOSM	gearing outperformance sharing mechanism
GSM	Global System for Mobile Communications
HDSL	High-bit-rate Digital Subscriber Line
HFC	hybrid fibre coaxial

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IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICC	Interstate Commerce Commission (USA)
ICT	information and communications technology
IEA	International Energy Agency
IFR	interchange fee regulation
ILEC	Incumbent Local Exchange Carrier
IMF	International Monetary Fund
IP	Internet Protocol
IPEX	Italian Power Exchange
IPP	independent power producer
IPTV	Internet Protocol television
ISO	independent system operator
ISP	Internet Service Provider
ITU	International Telecommunications Union
JKM	Japan Korean Marker
JNR	Japanese National Railways
LCC	low-cost carrier
LMP	locational marginal pricing
LNG	liquefied natural gas
LPG	liquefied petroleum gas
LRIC	long-run incremental costs
LRIC+	long-run incremental costs plus mark-up
LRMC	long-run marginal cost
LSE	load-serving entity
LTE	Long Term Evolution (of mobile communications)
MaaS	mobility as a service
M-ECPR	market-adjusted ECPR
MFJ	Modified Final Judgment (in relation to the AT&T case)
MIBEL	Mercado Ibérico de la Electricidad (Iberian Electricity Market)
MSC	merchant service charge
MTM	mobile-to-mobile (access)
MVNO	mobile virtual network operators
Nacha	National Automated Clearinghouse Association
NAESB	North American Energy Standards Board
NAO	National Audit Office (UK)
NARUC	National Association of Regulatory Utility Commissioners
NBN	National Broadband Network (Australia)
NBP	national balancing point (Britain)

List of Selected Acronyms and Abbreviations xxiii

NEB	National Energy Board (Canada)
NEM	National Electricity Market (Australia)
NETA	New Electricity Trading Arrangements (England and Wales)
NGDC	natural gas distribution companies
NGAN	next-generation access network
NGN	next-generation network
NordPool	Nordic electricity trading market
NPA	new payments architecture
NPP	New Payments Platform
NPV	net present value
NRA	National Regulatory Authority/Agency
NRA	National Rivers Authority (now Environment Agency, UK)
NSA	national supervisory authority
NTS	National Transmission System
NYMEX	New York Mercantile Exchange
OCM	operational capital maintenance
OECD	Organisation for Economic Cooperation and Development
OEB	Ontario Energy Board (Canada)
Ofcom	Office of Communications (UK)
Offer	Office of Electricity Regulation (now Ofgem, Britain)
Ofgas	Office of Gas Supply (now Ofgem, Britain)
Ofgem	Office of Gas and Electricity Markets (Britain)
OFT	Office of Fair Trading (UK)
Oftel	Office of Telecommunications (now Ofcom, UK)
Ofwat	Office of Water Services (England and Wales)
ORC	optimised replacement cost
ORR	Office of the Rail Regulator (Britain)
OTC	over-the-counter
OTT	over-the-top
PCR	price cap regulation
PIP	payment interface provider
PISP	payment initiation service provider
PJM	Pennsylvania–New Jersey–Maryland (electricity market, USA)
POLPX	Polish Power Exchange
PPA	power purchase agreement
PPP	public–private partnerships
PSB	Payment Systems Board (Australia)
PSD	Payment Services Directive
PSP	payment service provider

xxiv List of Selected Acronyms and Abbreviations

PSR	payment systems regulator
PSTN	Public Switched Telephone Network
PSV	Punto di Scambio Virtuale (Virtual Trading Point, Italy)
PUC	Public Utility Commission
PV	photovoltaic (solar panel)
QoS	quality of service
RAB	regulatory (or regulated) asset base
RAV	regulatory (or regulated) asset value
RBOC	Regional Bell Operating Companies
RCV	regulatory (or regulated) capital value
RGGI	Regional Greenhouse Gas Initiative (USA)
RIIO	revenues = incentives + innovation + outputs
ROR	rate of return
ROSCO	Rolling Stock Leasing Company
RPI-X	retail price index minus X (RPI - X)
RPNP	receiving party network pays
RPP	receiving party pays
RTP	real-time payments
SAC	stand-alone cost
SFA	stochastic frontier analysis
SIM	Subscriber Identity Module
SLA	service level agreement
SMP	significant market power
SMS	strategic market status
SO ₂	sulfur dioxide
SRMC	short-run marginal cost
STB	Surface Transportation Board (USA)
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TCP	Transmission Control Protocol
TD-LRIC	top-down long-run incremental cost
TELRIC	total element long-run incremental cost
TGE	Towarowa Gielda Energii (Polish Power Exchange)
TFP	total factor productivity
TKG	Telecommunications Act (Germany)
TNUoS	transmission network use of system
Totex	total expenditure approach
TPP	third-party providers
TSLRIC	total service long-run incremental cost
TTF	title transfer facility

List of Selected Acronyms and Abbreviations xxv

UAS	unmanned aircraft system (drone)
UNECE	United Nations Economic Commission for Europe
USO	universal service obligation
UTM	unmanned aircraft system traffic management
UTMSP	UTM service providers
VDSL	Very-high-bit-rate Digital Subscriber Line
VoIP	Voice-over-Internet Protocol
VPP	virtual power plants
WACC	weighted average cost of capital
WHO	World Health Organization
WiMax	Worldwide Interoperability for Microwave Access
WTO	World Trade Organization
xDSL	x type Digital Subscriber Line (such as VDSL or ADSL)

Cambridge University Press & Assessment
978-1-316-51451-1 — Modern Economic Regulation
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