# The Entrepreneurial State By Mariana Mazzucato

### **CONTENTS**

List of Tables and Figures xi List of Acronyms xiii Acknowledgements xv Foreword by Carlota Perez xix

# **Introduction: Do Something Different**

A Discursive Battle 1
Beyond Fixing Failures 3
From 'Crowding In' to 'Dynamizing In' 5
Images Matter 6
Structure of the Book 9

# Chapter 1: From Crisis Ideology to the Division of Innovative Labour

And in the Eurozone 17
State Picking Winners vs. Losers Picking the State 18
Beyond Market Failures and System Failures 21
The Bumpy Risk Landscape 22
Symbiotic vs. Parasitic Innovation 'Ecosystems' 23
Financialization 25

# Chapter 2: Technology, Innovation and Growth

Technology and Growth 33 From Market Failures to System Failures 34 Myths about Drivers of Innovation and Ineffective Innovation Policy 41

Myth 1: Innovation Is about R&D 44 Myth 2: Small Is Beautiful 45

Myth 3: Venture Capital Is Risk Loving 47

Myth 4: We Live in a Knowledge Economy – Just Look at all the Patents! 50

Myth 5: Europe's Problem is all about Commercialization 52

Myth 6: Business Investment Requires 'Less Tax and Red Tape' 53

#### Chapter 3: Risk-Taking State: From 'De-Risking' to 'Bring It On!'

What Type of Risk? 58 State Leading in Radical (Risky) Innovation 62

Pharmaceuticals: Radical vs. 'Me Too' Drugs 64 Biotechnology: Public Leader, Private Laggard 67

The National Institutes of Health: Creating the Wave vs. Surfing It 68

# **Chapter 4: The US Entrepreneurial State**

The Defense Advanced Research Projects Agency (DARPA) 74
The Small Business Innovation Research (SBIR) Programme 79
Orphan Drugs 81
The National Nanotechnology Initiative 83

# Chapter 5: The State behind the iPhone

The 'State' of Apple Innovation 88 Surfing Through the Waves of Technological Advancements 93



From Apple I to the iPad: The State's very visible hand 94

How State-funded research made possible Apple's 'invention' of the iPod 95

Giant magnetoresistance (GMR), SPINTRONICS programme and hard disk drives 96

Solid-state chemistry and silicon-based semiconductor devices 97

From capacitive sensing to click-wheels 99

The Birth of the iPod's Siblings: The iPhone and iPad 101

From click-wheels to multi-touch screens 102

Internet and HTTP/HTML 103

GPS and SIRI 105

Battery, display and other technologies 106

Did the US Government 'Pick' the iPod? 109

Fostering an Indigenous Sector 110

# Chapter 6: Pushing vs. Nudging the Green Industrial Revolution

Funding a Green Industrial Revolution 116

National Approaches to Green Economic Development 119

China's 'green' 5-year plan 122

UK's start-stop approach to green initiatives 124

United States: An ambiguous approach to green technologies 126

Pros and cons of the US model 127

Pushing – Not Stalling – Green Development 136

The Importance of Patient Capital: Public Finance and State Development Banks 138

# Chapter 7: Wind and Solar Power: Government Success Stories and Technology in Crisis

Wind and Solar Power: Growth Powered by Crisis 142

From the First 'Wind Rush' to the Rise of China's Wind Power Sector 144

Solar Power Companies and the Origin of Their Technologies 150

Solar Bankruptcies: Where there's a Will there's a Way 153

Competition, Innovation and Market Size (Who's Complaining?) 156

Conclusion: Clean Technology in Crisis 158

Myth 1: It's all about R&D 159

Myth 2: Small is beautiful 160

Myth 3: Venture capital is risk loving 161

Building a green innovation ecosystem (symbiotic not parasitic) 162

# Chapter 8: Risks and Rewards: From Rotten Apples to Symbiotic Ecosystems

Back to Apple: What Did the US Government Get Back for Its Investments? 167

Apple's job-creation myth: Not all jobs are created equally 168

Apple's love-hate relationship with US tax policies 171

The paradox of miracles in the digital economy: Why does corporate success result in regional economic misery? 176

Where Are Today's Bell Labs? 178

# Chapter 9: Socialization of Risk and Privatization of Rewards: Can the Entrepreneurial State Eat Its Cake Too?

The Skewed Reality of Risk and Reward 181

A New Framework 185

Direct or Indirect Returns 187

# **Chapter 10: Conclusion**

Appendix 199

Bibliography 201

Index 223