Table of Contents

Chapter 1 A Look Inside the Economic Growth Engine		21	Chapter 3 Innovations with Future Breakthrough Potential		95
1.1	Economic growth throughout history	21	3.1	3D Printing	96
1.2	How innovation drives economic growth	26	3.1.1	The development of 3D printing and its economic importance	96
1.3	Frontier innovation and diffusion	30	3.1.2	The 3D printing innovation ecosystem	99
1.4	Innovation and IP rights	36	3.1.3	3D printing and the IP system	104
1.5	Future prospects for innovation-driven growth	39	3.2	Nanotechnology	108
CI.		37	3.2.1	The development of nanotechnology and its economic importance	108
Chapter 2 Historical Breakthrough Innovations		49	3.2.2	The nanotechnology innovation ecosystem	111
2.1			3.2.3	Nanotechnology and the IP system	116
	Airplanes	50	3.3	Robotics	120
2.1.1	The development of the commercial airplane and its economic contribution	50	3.3.1	The development of robotics and its economic importance	120
2.1.2	The airplane innovation ecosystem	55	3.3.2	The robotics innovation ecosystem	123
2.1.3	Airplanes and the IP system	60	3.3.3	Robotics and the IP system	127
2.2	Antibiotics	63	3.4	Lessons learned	133
2.2.1	The discovery and development of antibiotics and their economic contribution	63	Acronyms		141
2.2.2	The antibiotics innovation ecosystem	67	Technical Notes		142
2.2.3	Antibiotics and the IP system	69			
2.3	Semiconductors	74			
2.3.1	The development of semiconductors and their economic contribution	74			
2.3.2	The semiconductor innovation ecosystem	77			
2.3.3	Semiconductors and the IP system	83			
2.4	Lessons learned	88			