Contents

	Who Wants to be an Economist?	1
1.	Change the Goal from GDP to the Doughnut	31
2.	See the Big Picture from self-contained market to embedded economy	61
3.	Nurture Human Nature from rational economic man to social adaptable humans	94
4.	Get Savvy with Systems from mechanical equilibrium to dynamic complexity	129
5.	Design to Distribute <i>from 'growth will even it up again' to distributive by design</i>	163
6.	Create to Regenerate from 'growth will clean it up again' to regenerative by design	206
7.	Be Agnostic about Growth from growth addicted to growth agnostic	243

CONTENTS	С	0	Ν	т	Е	N	т	s
----------	---	---	---	---	---	---	---	---

We Are All Economists Now	286
Afterword: Doughnut Economics in Action	294
Appendix: The Doughnut and its Data	300
Notes	305
Bibliography	337
Acknowledgements	355
About the Author	358
Index	360
Picture Acknowledgements	376

WHO WANTS TO BE AN ECONOMIST?

In October 2008, Yuan Yang arrived at Oxford University to study economics. Born in China and raised in Yorkshire, she had the outlook of a global citizen: passionate about current affairs, concerned about the future, and determined to make a difference in the world. And she believed that becoming an economist was the best way to equip herself to make that difference. She was eager, you could say, to become just the kind of economist that the twenty-first century needs.

But Yuan soon got frustrated. She found the theory – and the maths used to prove it – absurdly narrow in its assumptions. And since she began her studies just as the global financial system was heading into free fall, she could not help but notice it, even if her university syllabus didn't. 'The crash was a wake-up call,' she recounted. 'On the one hand we were being taught as if the financial system was not an important part of the economy. And on the other hand, its markets were clearly wreaking havoc, so we asked, "Why is there this disconnect?"' It was a disconnect, she realised, that ran far beyond the financial sector, visible in the gulf between the preoccupations of mainstream economic theory and growing real-world crises such as global inequality and climate change.

When she put her questions to her professors, they assured her that insight would come at the next level of study. So she enrolled for the next level – a Master's degree at the prestigious London School of Economics – and waited for that insight to come. Instead, the abstract theories intensified, the equations multiplied, and Yuan grew more dissatisfied. But with exams on the horizon, she faced a choice. 'At some point,' she told me, 'I realised that I just had to master this material, rather than trying to question everything. And I think that's a sad moment to have as a student.'

Many students coming to this realisation would have either walked away from economics, or swallowed its theories whole and built a lucrative career out of their qualifications. Not Yuan. She set out to find like-minded student rebels in universities worldwide and quickly discovered that, since the millennium, a growing number had publicly started to question the narrow theoretical framework that they were being taught. In 2000, economics students in Paris had sent an open letter to their professors, rejecting the dogmatic teaching of mainstream theory. 'We wish to escape from imaginary worlds!' they wrote, 'Call to teachers: wake up before it is too late!' 1 A decade later, a group of Harvard students staged a mass walk-out of a lecture by Professor Gregory Mankiw - author of the world's most widely taught economics textbooks - in protest against the narrow and biased ideological perspective that they believed his course espoused. They were, they said, 'deeply concerned that this bias affects students, the University, and our greater society'.²

When the financial crisis hit, it galvanised student dissent worldwide. It also spurred Yuan and her fellow rebels to launch a global network connecting over 80 student groups in more than 30 countries – from India and the US to Germany and Peru – in their demand for economics to catch up with the current generation, the century we are in, and the challenges ahead. 'It is not only the world economy that is in crisis,' they declared in an open letter in 2014:

The teaching of economics is in crisis too, and this crisis has consequences far beyond the university walls. What is taught shapes the minds of the next generation of policymakers, and therefore shapes the societies we live in . . . We are dissatisfied with the dramatic narrowing of the curriculum that has taken place over the last couple of decades . . . It limits our ability to contend with the multidimensional challenges of the 21st century – from financial stability, to food security and climate change.³

The more radical among these student protestors have been targeting highbrow conferences with their counter-cultural critiques. In January 2015, as the American Economic Association's annual meeting got under way in Boston's Sheraton Hotel, students from the Kick It Over movement plastered accusatory posters in the hotel's corridors, elevators and toilets, projected giant subversive messages on to the conference centre's street facade, and stunned the incredulous conference-goers by occupying their sedate panel discussions



In January 2015 rebel economics students commandeered the street front of the Boston Sheraton to greet the American Economic Association's annual conference with their counter-cultural critique.

and hijacking question time.⁴ 'The revolution of economics has begun,' the students' manifesto declared. 'On campus after campus we will chase you old goats out of power. Then in the months and years that follow, we will begin the work of reprogramming the doomsday machine.'⁵

It's an extraordinary situation. No other academic discipline has managed to provoke its own students – the very people who have chosen to dedicate years of their life to studying its theories – into worldwide revolt. Their rebellion has made one thing clear: the revolution in economics has indeed begun. Its success depends not only on debunking the old ideas but, more importantly, on bringing forth the new. As the ingenious twentieth-century inventor Buckminster Fuller once said, 'You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.'

This book takes up his challenge, setting out seven mind-shifting ways in which we can all learn to think like twenty-first-century economists. By revealing the old ideas that have entrapped us and replacing them with new ones to inspire us, it proposes a new economic story that is told in pictures as much as in words.

The twenty-first-century challenge

The word 'economics' was coined by the philosopher Xenophon in Ancient Greece. Combining *oikos*, meaning household, with *nomos*, meaning rules or norms, he invented the art of household management, and it could not be more relevant today. This century we need some pretty insightful managers to guide our planetary household, and ones who are ready to pay attention to the needs of all of its inhabitants.

There have been extraordinary strides in human well-being over the past 60 years. The average child born on planet Earth in 1950 could expect to live just 48 years; today such a child can look forward to 71 years of life.⁶ Since 1990 alone, the number of people living in extreme income poverty – on less than \$1.90 a day – has fallen by more than half. Over two billion people have gained access to safe drinking water and toilets for the first time. All this while the human population has grown by almost 40%.⁷

That was the good news. The rest of the story, of course, has not turned out so well so far. Many millions of people still lead lives of extreme deprivation. Worldwide, one person in nine does not have enough to eat.⁸ In 2015 six million children under the age of five died, more than half of those deaths due to easy-to-treat conditions like diarrhoea and malaria.⁹ Two billion people live on less than \$3 a day and over 70 million young women and men are unable to find work.¹⁰ Deprivations such as these have been exacerbated by growing insecurities and inequalities. The 2008 financial crash sent shock waves through the global economy, robbing many millions of people of their jobs, homes, savings and security. Meanwhile, the world has become extraordinarily unequal: as of 2015 the world's richest 1% now own more wealth than all the other 99% put together.¹¹

To these extremes of human circumstance, add the deepening degradation of our planetary home. Human activity is putting unprecedented stress on Earth's life-giving systems. Global average temperature has already risen by 0.8°C and we are on track for an increase of almost 4°C by 2100, threatening a scale and intensity of floods, droughts, storms and sea-level rise that humanity has never before witnessed.¹² Around 40% of the world's agricultural land is now seriously degraded and by 2025 two out of three people worldwide will live in water-stressed regions.¹³ Meanwhile over 80% of the world's fisheries are fully or over-exploited and a refuse truck's worth of plastic is dumped into the ocean every minute: at this rate, by 2050 there will be more plastic than fish in the sea.¹⁴

These are already overwhelming facts, but growth projections add to the challenge ahead. Global population stands today at 7.3 billion

and is expected to reach almost 10 billion by 2050, levelling off at around 11 billion by 2100.¹⁵ Global economic output is – if you believe business-as-usual projections – expected to grow by 3% per year from now until 2050, doubling the global economy in size by 2037 and almost trebling it by 2050.¹⁶ The global middle class – those spending between \$10 and \$100 a day – is set to expand rapidly, from 2 billion today to 5 billion by 2030, bringing a surge in demand for construction materials and consumer products.¹⁷ These are the trends that shape humanity's prospects at the start of the twenty-first century. So what kind of thinking do we need for the journey ahead?

The authority of economics

However we tackle these interwoven challenges, one thing is clear: economic theory will play a defining role. Economics is the mother tongue of public policy, the language of public life, and the mindset that shapes society. 'In these early decades of the twenty-first century, the master story is economic: economic beliefs, values and assumptions are shaping how we think, feel and act,' writes F. S. Michaels in her book *Monoculture: How One Story is Changing Everything*.¹⁸

Perhaps this is why economists carry an air of authority. They take front-row seats as experts in the international policy arena – from the World Bank to the World Trade Organization – and are rarely far from the ear of power. In the US, for example, the President's Council of Economic Advisers is by far the most influential, high-profile and long-running of all the White House's advisory councils, while its sibling councils for environmental quality and science and technology are barely known beyond the Beltway. In 1968, the prestige of Nobel Prizes awarded for scientific advances in physics, chemistry and medicine was controversially extended: Sweden's central bank successfully lobbied and paid for

a Nobel-Memorial prize to be awarded annually in 'Economic Sciences' too, and its laureates have become academic celebrities ever since.

Not all economists have been comfortable with this apparent authority. Back in the 1930s, John Maynard Keynes - the Englishman whose ideas would transform post-war economics - was already worrying about the role played by his profession. 'The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else,' he famously wrote. 'Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist.'19 The Austrian economist Friedrich von Hayek, best known as the 1940s father of neoliberalism, disagreed violently with Keynes on almost all questions of theory and policy, but on this matter they concurred. In 1974 when Hayek was awarded that Nobel-Memorial prize, he accepted it with the remark that, had he been consulted on its creation, he would have advised against it. Why? Because, he told the assembled crowd, 'the Nobel Prize confers on an individual an authority which in economics no man ought to possess', particularly, he said, because, 'the influence of the economist that mainly matters is an influence over laymen: politicians, journalists, civil servants and the public generally'.20

Despite such misgivings from the twentieth century's two most influential economists, the dominance of the economist's perspective on the world has only spread, even into the language of public life. In hospitals and clinics worldwide, patients and doctors have been recast as customers and service-providers. In fields and forests on every continent, economists are calculating the monetary value of 'natural capital' and 'ecosystem services', ranging from the economic worth of the world's wetlands (said to be \$3.4 billion per year) to the global value of insect pollination services (equivalent to \$160 billion per year).²¹ Meanwhile, the financial sector's importance is constantly reinforced by media reporting, with daily radio and print headlines announcing the latest corporate quarterly results, while stock prices roll tickertape-style across the TV news.

Given the dominance of economics in public life, it is no surprise that so many university students, if given the chance, opt to study a little as part of their education. Every year, around five million college students in the United States alone graduate with at least one economics course under their belts. A standard introductory course that originated in the USA – and is widely known as Econ 101 – is now taught throughout the world, with students from China to Chile learning from translations of the very same textbooks used in Chicago and Cambridge, Massachusetts. For all of these students, Econ 101 has become a staple part of a broad education, whether they then head off to become an entrepreneur or doctor, journalist or political activist. Even for those who never study economics, the language and mindset of Econ 101 so pervades public debate that it shapes the way that we all think about the economy: what it is, how it works, and what it is for.

And here's the rub. Humanity's journey through the twenty-first century will be led by the policymakers, entrepreneurs, teachers, journalists, community organisers, activists and voters who are being educated today. But these citizens of 2050 are being taught an economic mindset that is rooted in the textbooks of 1950, which in turn are rooted in the theories of 1850. Given the fast-changing nature of the twenty-first century, this is shaping up to be a disaster. Of course the twentieth century gave rise to groundbreaking new economic thinking, most influentially in the battle of ideas between Keynes and Hayek. But though those iconic thinkers held opposing perspectives, they inherited flawed assumptions and common blind spots that lay unexamined at the root of their differences. The twenty-first-century context demands that we make those assumptions explicit and those blind spots visible so that we can, once again, rethink economics.

Walking away from economics - and back

As a teenager in the 1980s, I tried to piece together an understanding of the world by watching the evening news. The TV images that flashed daily into our living room took me far beyond my London schoolgirl life, and those images stuck. The unforgettable silent stare of pot-bellied children born into Ethiopia's famine. Lines of bodies knocked down like matchsticks by the Bhopal gas disaster. A purple-tinted hole gaping in the ozone layer. A vast oil slick swirling out of the *Exxon Valdez* into Alaska's pristine waters. By the end of the decade, I knew simply that I wanted to work for an organisation like Oxfam or Greenpeace – campaigning to end poverty and environmental destruction – and I thought that the best way to equip myself was to study economics and put its tools to work for such causes.

So I headed to Oxford University to get the skills that I believed would prepare me for the job. But the economic theory on offer left me frustrated because it made awkward assumptions about how the world worked, while glossing over the very issues I cared about most. I was lucky to have inspiring and wide-minded tutors, but they too were hemmed in by the syllabus that they were required to teach and we to master. So after four years of study, I found myself walking away from theoretical economics, too embarrassed ever to call myself 'an economist' and I immersed myself, instead, in real-world economic challenges.

I spent three years working with barefoot entrepreneurs in the villages of Zanzibar, in awe of the women who ran micro-businesses while raising their children without running water, electricity or a school in sight. I then hopped to the very different island of Manhattan, spending four years at the United Nations on the team writing the annual flagship *Human Development Report*, while witnessing barefaced power games block progress in international negotiations. I left to fulfil a long-held ambition and worked with Oxfam for over a decade. There I witnessed the precarious existences of women – from Bangladesh to Birmingham – employed at the sharp end of global supply chains. We lobbied to change the rigged rules and double standards governing international trade rules. And I explored the human-rights implications of climate change, meeting farmers from India to Zambia whose fields had been turned to bare earth because the rains had never come. Then I became a mother – of twins, to boot – and spent a year on maternity leave, immersed in the bare-bum economy of raising infants. When I returned to work, I understood the pressures on parents juggling job and family like never before.

Through all this, I gradually realised the obvious: that I could not simply walk away from economics, because it shapes the world we inhabit and its mindset had certainly shaped me, even if through my rejection of it. So I decided to walk back towards it and flip it on its head. What if we started economics not with its long-established theories, but with humanity's long-term goals, and then sought out the economic thinking that would enable us to achieve them? I tried to draw a picture of those goals and, ridiculous though it sounds, it came out looking like a doughnut – yes, the American kind with a hole in the middle. The full diagram is set out in the next chapter, but in essence it is a pair of concentric rings. Below the inner ring - the social foundation - lie critical human deprivations such as hunger and illiteracy. Beyond the outer ring - the ecological ceiling - lies critical planetary degradation such as climate change and biodiversity loss. Between those two rings is the Doughnut itself, the space in which we can meet the needs of all within the means of the planet.

Sugary, deep-fried doughnuts hardly seem a likely metaphor for humanity's aspirations but there was something about the image that struck a chord in me and in others, so it stuck. And it prompted a profoundly exciting question:

If humanity's twenty-first-century goal is to get into the Doughnut, what economic mindset will give us the best chance of getting there?



The essence of the Doughnut: a social foundation of well-being that no one should fall below, and an ecological ceiling of planetary pressure that we should not go beyond. Between the two lies a safe and just space for all.

With the Doughnut in hand, I pushed my old textbooks aside and sought out the best emerging ideas that I could find, exploring new economic thinking with open-minded university students, progressive business leaders, innovative academics and cutting-edge practitioners. This book brings together the key insights I have discovered along the way – insights into ways of thinking that I wish had crossed my path at the outset of my own economics education, and that I believe should be part of every economist's toolkit today. It draws on diverse schools of thought, such as complexity, ecological, feminist, institutional and behavioural economics. They are all rich with insight but there is still a risk that they will remain separated in silos, each school of thought nestled in its own journals, conferences, blogs, textbooks and teaching posts, cultivating its niche critique of last century's thinking. The real breakthrough lies, of course, in combining what they each have to offer and to discover what happens when they dance on the same page, which is just what this book sets out to do.

Humanity faces some formidable challenges, and it is in no small part thanks to the blind spots and mistaken metaphors of outdated economic thinking that we have ended up here. But for those who are ready to rebel, look sideways, to question and think again, then these are exciting times. 'Students must learn how to discard old ideas, how and when to replace them . . . how to learn, unlearn, and relearn,' wrote the futurist Alvin Toffler.²² This could not be more true for those seeking economic literacy: now is a great moment for unlearning and relearning the fundamentals of economics.

The power of pictures

Everybody's saying it: we need a new economic story, a narrative of our shared economic future that is fit for the twenty-first century. I agree. But let's not forget one thing: the most powerful stories throughout history have been the ones told with pictures. If we want to rewrite economics, we need to redraw its pictures too, because we stand little chance of telling a new story if we stick to the old illustrations. And if drawing new pictures sounds frivolous to you – like mere child's play – believe me it is not. Better still, let me prove it.

From prehistoric cave paintings to the map of the London Underground, images, diagrams and charts have long been at the heart of human storytelling. The reason why is simple: our brains are wired for visuals. 'Seeing comes before words. The child looks and recognizes before it speaks,' wrote the media theorist John Berger in the opening lines of his 1972 classic, *Ways of Seeing.*²³ Neuroscience has since confirmed the dominant role of visualisation in human

cognition. Half of the nerve fibres in our brains are linked to our vision and, when our eyes are open, vision accounts for two-thirds of the electrical activity in the brain. It takes just 150 milliseconds for the brain to recognise an image and a mere 100 milliseconds more to attach a meaning to it.²⁴ Although we have blind spots in both of our eyes – where the optic nerve attaches to the retina – the brain deftly steps in to create the seamless illusion of a whole.²⁵

As a result, we are born pattern-spotters, seeing faces in the clouds, ghosts in the shadows, and mythical beasts in the stars. And we learn best when there are pictures to look at. As the visual literacy expert Lynell Burmark explains, 'unless our words, concepts and ideas are hooked onto an image, they will go in one ear, sail through the brain, and go out of the other ear. Words are processed by our short-term memory where we can only retain about seven bits of information . . . Images, on the other hand, go directly into long-term memory where they are indelibly etched.'²⁶ With far fewer pen strokes, and without the weight of technical language, images have immediacy – and when text and image send conflicting messages, it is the visual message that most often wins.²⁷ So the old adage turns out to be true: a picture really is worth a thousand words.

It is hardly surprising, then, that imagery has played such a central role in the way that humans have learned to make sense of the world. In the sixth century BCE, the oldest known map of the world, the Imago Mundi, was etched into clay with a sharpened stick in Persia, showing Earth as a flat disc and with Babylon firmly at its centre. The Ancient Greek father of geometry, Euclid, mastered the analysis of circles, triangles, curves and rectangles in twodimensional space, creating a diagrammatic convention that Isaac Newton later used to lay out his groundbreaking laws of motion, and that is still used in maths classes worldwide today. Few people have heard of the Roman architect Marcus Vitruvius Pollio but Leonardo da Vinci's visual depiction of his theory of proportion is instantly recognised the world over in the image of Vitruvian Man, standing – naked and open armed – in a circle and square simultaneously. In 1837 when Charles Darwin first drew in his field notebook an irregular little diagram of a branching tree – with the words 'I think' jotted above it – he captured the crux of an idea that would turn into *The Origin of Species*.²⁸

Across cultures and time, it is clear that people have long understood the power of imagery, and its ability to overturn deeply held beliefs. Pictures stick in the mind's eye and wordlessly reshape our view of the world. No wonder Nicolaus Copernicus – who spent his life studying the motion of the planets – waited until he was on his deathbed before he dared to publish this one:



Copernicus's 1543 depiction of the universe, which showed Earth revolving around the sun.

By depicting the sun – not Earth – at the centre of our solar system, Copernicus's picture triggered an ideological revolution that would unravel church doctrine, threaten to upend papal power, and transform humanity's understanding of the cosmos and our place in it. It is extraordinary what havoc a few concentric circles can unleash.

Think, then, of the circles, parabolas, lines and curves that make up the core diagrams in economics - those seemingly innocuous pictures depicting what the economy is, how it moves, and what it is for. Never underestimate the power of such images: what we draw determines what we can and cannot see, what we notice and what we ignore, and so shapes all that follows. The images that we draw to describe the economy invoke the timeless truths of Euclid's maths and Newton's physics in their geometric simplicity. But in doing so, they slip swiftly into the back of our head, wordlessly whispering the deepest assumptions of economic theory that need never be put into words because they have been inscribed in the mind's eye. They present a very partial picture of the economy, smoothing over economic theory's own peculiar blind spots, enticing us to search for laws within their lines, and sending us in pursuit of false goals. What's more, those images linger, like graffiti on the mind, long after the words have faded; they become stowaway intellectual baggage, lodged in your visual cortex without you even realising it is there. And – just like graffiti – it is very hard to remove. So if a picture is worth a thousand words then, in economics at least, we should pay a great deal more attention to the pictures that we teach, draw and learn.

Some might dismiss this suggestion with the rebuttal that economic theory is taught not in pictures but in equations, page after page of them. Economics departments, after all, seek to recruit mathematicians, not artists, to join their ranks. But economics has in fact always been taught with both diagrams and equations, and the diagrams have played a particularly powerful role, thanks to a few maverick characters and surprise twists in the field's littleknown but fascinating past.

Images in economics: a hidden history

Many of the founding fathers of economics used imagery to express their seminal ideas. When in 1758 the French economist François Quesnay published his Tableau économique - with its zigzagging lines depicting the flow of money as it circulated between landowners, labourers and merchants - he effectively drew up the first quantified economic model. In the 1780s the British political economist William Playfair began to invent new ways of presenting data, using what every schoolchild now knows as graphs, bar charts and pie charts. With these tools he powerfully visualised the political issues of his day, such as the sharply rising price of wheat for the day labourer, and England's shifting balance of trade with the rest of the world. A century later, the British economist William Stanley Jevons drew a picture depicting what he called 'the law of demand', plotting incremental changes in price and quantity along a curve in order to show that, as the price of a thing falls, people will want to buy more of it. Aspiring to make his theory seem as scientific as physics, he



Aspiring to make economics seem as scientific as physics, Jevons drew his theories in the style of Newton's diagrams of the laws of motion.

intentionally drew it in a style that closely resembled Newton's depiction of the laws of motion. And that demand curve still features in the first diagram encountered by the novice student today.

The first half of twentieth-century economics was dominated by Alfred Marshall's 1890 book, *Principles of Economics*, the master text used to teach most students. In its preface, Marshall mused on the relative merits of using equations versus diagrams to elucidate the text. Mathematical equations, he believed, were most useful 'in helping a person to write down quickly, shortly and exactly, some of his thoughts for his own use . . . But when a great many symbols have to be used, they become very laborious to any one but the writer himself.' The value of diagrams, he believed, was far greater. 'The argument in the text is never dependent upon them; and they may be omitted,' he wrote, 'but experience seems to show that they give a firmer grasp of many important principles than can be got without their aid; and that there are many problems of pure theory, which no one who has once learnt to use diagrams will willingly handle in any other way.'²⁹

It was Paul Samuelson, however, who decisively placed imagery at the heart of economic thought in the second half of the twentieth century. Known as the father of modern economics, Samuelson spent his seven-decade career at the Massachusetts Institute of Technology (MIT) and on his death in 2009 he was heralded as 'one of the giants on whose shoulders every contemporary economist stands'.³⁰ He was enamoured of equations and diagrams, and he profoundly influenced the use of both in economic theory and teaching. But, crucially, he believed they were suited to very different audiences: in short, equations were for the specialists; pictures for the masses.

Samuelson's first major work was the book of his doctoral dissertation, *Foundations of Economic Analysis*. Published in 1947, it was aimed at the hard-core theorist, and was unapologetically mathematical: equations, he believed, should be the mother tongue of

DOUGHNUT ECONOMICS



Paul Samuelson: the man who drew economics.

professional economists, serving to cut through muddled thinking and replace it with scientific precision. He wrote his second book, however, for an utterly different audience, and only thanks to a twist of fate.

At the end of the Second World War, US college enrolments ballooned as hundreds of thousands of ex-servicemen returned home in search of the education that they had missed and the jobs that they desperately needed. Many opted to study engineering – essential for post-war construction – and were required to learn a little economics along the way. Samuelson was, at the time, a 30-year-old professor at MIT and a self-declared 'whippersnapper go-getter in esoteric theory'. But his departmental boss, Ralph Freeman, had a problem on his hands: 800 engineering students at MIT had started a year-long compulsory course in economics and it was not going well. Samuelson recalled the conversation that took place when Freeman turned up at his office one day and closed the door behind him. 'They hate it,' Freeman confessed, 'We've tried everything. They still hate it . . . Paul, will you go on half time for a semester or two? Write a text the students will like. If they like it, yours will be good economics. Leave out whatever you like. Be as short as you wish. Whatever you come up with, that will be a vast improvement on where we are.'³¹

It was, said Samuelson, an offer he couldn't refuse and the text that he wrote over the next three years - titled simply Economics became the 1948 textbook classic that shot him to lifelong fame. Fascinatingly, the strategy he chose in writing it followed right in the footsteps of the medieval Roman Catholic Church. Before the advent of the printing press, the Church had used two quite distinct methods to spread its doctrine. The learned few - monks, priests and scholars - were required to read the Bible in Latin, writing out its verses line by line. In contrast, the illiterate masses were taught the Bible's stories in pictures, painted as frescoes on church walls and illuminated in stained-glass windows. It turned out to be a highly successful mass communications strategy. Samuelson was just as smart: setting aside the specialist's equations, he fully embraced diagrams, graphs and charts to create his one-stop-shop economics course for the masses. And since his primary audience was a cohort of engineers, he adopted a visual style that they would have found familiar, drawn in the tradition of mechanical engineering and fluid mechanics. On the next page, for example, is an image from the first edition of his textbook, showing how income circulates round the economy, with new investments topping it up. It evolved to become his most famous diagram - known as the Circular Flow - and was clearly based on the metaphor of water flowing through plumbed pipes.32

His picture-rich textbook was a hit, and what worked for the engineers turned out to work for the rest too. *Economics* was soon adopted



Samuelson's 1948 Circular Flow diagram, which depicted income flowing round the economy as if it were water flowing round plumbed pipes.

by university professors across the country, and then overseas. It became America's bestselling textbook – across all subjects – for nearly thirty years. Translated into more than forty languages, it sold four million copies worldwide over a span of sixty years, providing generations of students with all they needed to know about Econ 101.³³ With each new edition came more pictures: the 70 diagrams in the first edition had multiplied to almost 250 diagrams by the 11th edition in 1980. Samuelson deeply understood and relished this influence because he saw the college freshman's mind as a blank slate. 'I don't care who writes a nation's laws – or crafts its advanced treatises – so long as I can write its economics textbooks,' he declared in later years, 'The first lick is the privileged one, impinging on the beginner's tabula rasa at its most impressionable state.'³⁴

A long struggle of escape

Paul Samuelson was not alone in appreciating the extraordinary influence wielded by those who determine how we begin. His teacher and mentor, Joseph Schumpeter, also realised that the ideas handed down to us can be very hard to shake off, but he was determined to do so, to make way for his own insights. As Schumpeter wrote in his 1954 *History of Economic Analysis*,

In practice we all start our own research from the work of our predecessors, that is, we hardly ever start from scratch. But suppose we did start from scratch, what are the steps we should have to take? Obviously, in order to be able to posit to ourselves any problems at all, we should first have to visualize a distinct set of coherent phenomena as a worthwhile object of our analytic effort. In other words, analytic effort is of necessity preceded by a preanalytic cognitive act that supplies the raw material for the analytic effort. In this book, this pre-analytic cognitive act will be called Vision.

He was clear, however, that creating a new pre-analytic vision could never be an impartial process, adding:

The first task is to verbalize the vision or to conceptualize it . . . in a more or less orderly schema or picture . . . It should be perfectly clear that there is a wide gate for ideology to enter into this process. In fact, it enters on the very ground floor, into the preanalytic cognitive act of which we have been speaking. Analytic work begins with material provided by our vision of things, and this vision is ideological almost by definition.³⁵

Other thinkers have used different words to make a similar point. Schumpeter's concept of pre-analytic vision was inspired by the ideas of sociologist Karl Mannheim whose observation in the late 1920s that, 'every point of view is particular to a social situation' led him to popularise the notion that we each have a 'worldview' which acts as the lens through which we interpret the world. In the 1960s, Thomas Kuhn turned scientific research upside down by pointing out that 'scientists work from models acquired through education . . . often without quite knowing or needing to know what characteristics have given these models the status of community paradigms'.³⁶ In the 1970s, sociologist Erving Goffmann introduced the concept of 'framing' – in the sense that each of us views the world through a mental picture frame – to show that the way we make sense out of our jumble of experience delineates what we can then see.³⁷

Pre-analytic vision. Worldview. Paradigm. Frame. These are cousin concepts. What matters more than the one you choose to use is to realise that you have one in the first place, because then you have the power to question and change it. In economics, that's an open invitation to look afresh at the mental models we employ in describing and understanding the economy. But it is no easy thing to do, as Keynes discovered. Coming up with his groundbreaking theory in the 1930s was, he admitted, 'a struggle of escape from habitual modes of thought and expression . . . The difficulty lies not in the new ideas, but in the old ones which ramify, for those of us brought up as most of us have been, into every corner of our minds.³³⁸

The possibility of shaking off old mental models is enticing, but the quest for new ones comes with caveats. First, always remember that 'the map is not the territory', as the philosopher Alfred Korzybski put it: every model can only ever be a model, a necessary simplification of the world, and one that should never be mistaken for the real thing. Second, there is no correct pre-analytic vision, true paradigm or perfect frame out there to be discovered. In the deft words of the statistician George Box, 'All models are wrong, but some are useful.'³⁹ Rethinking economics is not about finding the correct one (because it doesn't exist), it's about choosing or creating one that best serves our purpose – reflecting the context we face, the values we hold, and the aims we have. As humanity's context, values, and aims continually evolve, so too should the way that we envision the economy.

There may be no perfect frame waiting to be found but, argues the cognitive linguist George Lakoff, it is absolutely essential to have a compelling alternative frame if the old one is ever to be debunked. Simply rebutting the dominant frame will, ironically, only serve to reinforce it. And without an alternative to offer, there is little chance of entering, let alone winning, the battle of ideas.

Lakoff has for years drawn attention to the power of verbal framing in shaping political and economic debate. He points, by way of example, to the notion of 'tax relief' widely used by US conservatives: in just two words, it frames tax as an affliction, a burden to be lifted by a heroic rescuer. How should progressives respond? Certainly not by arguing 'against tax relief' because repeating that phrase merely strengthens the frame (who could be against relief, after all?). But, says Lakoff, progressives too often try to set out their own views on tax with lengthy explanations, precisely because no concise alternative frame has been developed.⁴⁰ They desperately need an alternative two-word phrase to encapsulate their view and counter the other. In fact the frame of 'tax justice' - which instantly invokes community, fairness and accountability - has been fast gaining traction internationally as global scandals over tax havens and corporate tax avoidance have hit the headlines. Having a powerful way to frame the matter has no doubt helped to channel public outrage and mobilise widespread demand for change.41

Just as Lakoff's work has revealed the power of *verbal* framing in political and economic debate, this book aims to reveal the power of *visual* framing, and to use it to transform twenty-first-century economic thinking. I only realised just how powerful visual framing can be in 2011 when I first drew the Doughnut and was taken aback by the international response to it. In the arena of sustainable

development, it soon became an iconic image that was used by activists, governments, corporations and academics alike to change the terms of debate. In 2015, insiders to the UN process of negotiating the Sustainable Development Goals – the 17 globally agreed goals for charting human progress – told me that, in late-night meetings to hammer out the final text, the image of the Doughnut was there on the table as a reminder of the big-picture goals they were aiming for. Many people told me that the Doughnut made visible the way that they had always thought about sustainable development; they had just never seen it drawn before. What struck me most was the impact that the image had in fostering new ways of thinking: it helped to reinvigorate old debates and instigate new ones, while offering a positive vision of an economic future worth striving for.

Visual frames, it gradually dawned on me, matter just as much as verbal ones. That realisation drove me to look back at the images that had dominated my own economic education and I saw for the first time just how powerfully they summed up and reinforced the mindset I had been taught. At the heart of mainstream economic thinking is a handful of diagrams that have wordlessly but powerfully framed the way we are taught to understand the economic world – and they are all out of date, blinkered, or downright wrong. They may lie hidden from view but they deeply frame the way we think about economics in the classroom, in government, in the boardroom, in the media, and in the street. If we want to write a new economic story, we must draw new pictures that leave the old ones lying in the pages of last century's textbooks.

What, then, if you have never studied economics, never laid your eyes on its most powerful pictures? For starters, don't kid yourself that you are immune to their influence: no one is. Those diagrams so strongly frame the way that economists, politicians and journalists talk about the economy that we all end up invoking them with our words even if we have never seen them with our eyes. But at the same time, as an economic novice, consider yourself lucky that Paul Samuelson never got that first lick of your *tabula rasa*. The fact that you have never sat through an economics lecture may just turn out to be a distinct advantage, after all: you've less baggage to offload, less graffiti to scrub out. Every now and then, being untutored can be an intellectual asset – and this is one of those moments.

Seven ways to think like a twenty-first-century economist

Whether you consider yourself an economic veteran or novice, now is the time to uncover the economic graffiti that lingers in all of our minds and, if you don't like what you find, scrub it out; or, better still, paint it over with new images that far better serve our needs and times. The rest of this book proposes seven ways to think like a twenty-first-century economist, revealing for each of those seven ways the spurious image that has occupied our minds, how it came to be so powerful, and the damaging influence it has had. But the time for mere critique is past, which is why the focus here is on creating new images that capture the essential principles to guide us now. The diagrams in this book aim to summarise that leap from old to new economic thinking. Taken together they set out – quite literally – a new big picture for the twenty-first-century economist. So here is a whirlwind tour of the ideas and images at the heart of Doughnut Economics.

First, change the goal. For over 70 years economics has been fixated on GDP, or national output, as its primary measure of progress. That fixation has been used to justify extreme inequalities of income and wealth coupled with unprecedented destruction of the living world. For the twenty-first century a far bigger goal is needed: meeting the human rights of every person within the means of our life-giving planet. And that goal is encapsulated in the concept of the Doughnut. The challenge now is to create economies – local to





global – that help to bring all of humanity into the Doughnut's safe and just space. Instead of pursuing ever-increasing GDP, it is time to discover how to thrive in balance.

Second, see the big picture. Mainstream economics depicts the whole economy with just one, extremely limited image, the Circular Flow diagram. Its limitations have, furthermore, been used to reinforce a neoliberal narrative about the efficiency of the market, the incompetence of the state, the domesticity of the household, and the tragedy of the commons. It is time to draw the economy anew, embedding it within society and within nature, and powered by the sun. This new depiction invites new narratives – about the power of the market, the partnership of the state, the core role of the household, and the creativity of the commons.

Third, nurture human nature. At the heart of twentieth-century economics stands the portrait of rational economic man: he has told us that we are self-interested, isolated, calculating, fixed in taste, and dominant over nature – and his portrait has shaped who we have become. But human nature is far richer than this, as early sketches of our new self-portrait reveal: we are social, interdependent, approximating, fluid in values, and dependent upon the living world. What's more, it is indeed possible to nurture human nature in ways that give us a far greater chance of getting into the Doughnut's safe and just space.

Fourth, get savvy with systems. The iconic criss-cross of the market's supply and demand curves is the first diagram that every economics student encounters, but it is rooted in misplaced nineteenth-century metaphors of mechanical equilibrium. A far smarter starting point for understanding the economy's dynamism is systems thinking, summed up by a simple pair of feedback loops. Putting such dynamics at the heart of economics opens up many new insights, from the boom and

bust of financial markets to the self-reinforcing nature of economic inequality and the tipping points of climate change. It's time to stop searching for the economy's elusive control levers and start stewarding it as an ever-evolving complex system.

Fifth, design to distribute. In the twentieth century, one simple curve – the Kuznets Curve – whispered a powerful message on inequality: it has to get worse before it can get better, and growth will (eventually) even it up. But inequality, it turns out, is not an economic necessity: it is a design failure. Twenty-first-century economists will recognise that there are many ways to design economies to be far more distributive of the value that they generate – an idea best represented as a network of flows. It means going beyond redistributing income to exploring ways of redistributing wealth, particularly the wealth that lies in controlling land, enterprise, technology, knowledge, and the power to create money.

Sixth, create to regenerate. Economic theory has long portrayed a 'clean' environment as a luxury good, affordable only for the well-off. This view was reinforced by the Environmental Kuznets Curve, which once again whispered that pollution has to get worse before it can get better, and growth will (eventually) clean it up. But there is no such law: ecological degradation is simply the result of degenerative industrial design. This century needs economic thinking that unleashes regenerative design in order to create a circular – not linear – economy, and to restore humans as full participants in Earth's cyclical processes of life.

Seventh, be agnostic about growth. One diagram in economic theory is so dangerous that it is never actually drawn: the long-term path of GDP growth. Mainstream economics views endless economic growth as a must, but nothing in nature grows for ever and the attempt to buck that trend is raising tough questions in