The sweat was dripping down my face as I awaited my grilling in the UK House of Commons. I’d been summoned to testify in front of the Select Committee on Business. This was a group of MPs who, infuriated by a couple of high-profile scandals, had launched an inquiry into how companies were being run.

In my day job as a finance professor, I’m used to being interrogated by students in lectures, journalists in interviews and executives in workshops. But being probed by MPs on live TV and having your testimony transcribed as public record is another level, so I was feeling pretty nervous. I got to the House of Commons early and sat in on the session before mine, burying my head in my notes to swot up on every question the Committee might ask.

My ears pricked up when a witness in that session mentioned some research which sounded noteworthy. It apparently found that companies are more successful when there’s a smaller gap between the pay of the CEO and the pay of the average worker. I was intrigued, because my own research shows that employee-friendly firms outperform their peers. My studies don’t focus on pay, but this new evidence appeared to complement my findings. For many years I’d been trying to convince companies of the importance of treating workers fairly, and this looked like another arrow to add to my quiver. I wanted it to be true.

If my twenty years in research have taught me anything, however, it’s not to accept claims at face value. I pulled up the witness’s written statement and saw they were referring to a
report by Faleye, Reis and Venkateswaran. But when I looked it up, it seemed to say the exact opposite: the higher the gap between CEO and worker salaries, the better the company’s performance.

I was confused. Perhaps my nerves led me to misunderstand the study? After all, academic papers aren’t known for their clarity. Yet their conclusion was right there on the front page and as clear as day: companies do better if they have greater pay gaps.

It then dawned on me what had happened. The witness statement actually quoted a half-finished draft by Faleye, Reis and Venkateswaran that was released three years before the final version. I was looking at the published article, after it had gone through peer review and corrected its mistakes – leading to a completely opposite result.

The witness in question was from the Trades Union Congress (TUC), which holds a strong public position against pay gaps. In 2014, it published a report declaring that ‘high pay differentials damage employee morale, are detrimental to firm performance [and] contribute to inequality across the economy’. So the TUC may have jumped on this preliminary draft, without checking whether a completed version was available, because it showed exactly what it wanted.

My own session went smoothly. One question had me stumped, but I told the MPs that I wasn’t an expert in that topic rather than trying to make up an answer. They seemed surprised, as if no one had ever admitted to not knowing something before. In the corridor afterwards, I told the Clerk to the Select Committee about the tainted evidence in the earlier session. He seemed appalled and asked me to submit a formal memo highlighting the error. I did so, and the Committee published it.

Yet the Committee’s final report on the inquiry referred to the overturned study as if it were gospel. It said: ‘The TUC
Introduction

states that "There is clear academic evidence that high wage disparities within companies harm productivity and company performance" - even though this statement was contradicted by the very researchers the TUC quoted in support. Partly due to this claim, the report recommended that every large UK company disclose its pay gap, and this eventually became law.6

The takeaway I’d like to draw is nothing to do with pay gaps – whether they should be published, or whether large gaps are good or bad. Even if bigger differences lead to better performance, we might care about equality more than profits. Instead, it’s to stress how careful we need to be with evidence.

This episode taught me two lessons. First, you can rustle up a report to support almost any opinion you want, even if it’s deeply flawed and has subsequently been debunked. A topical issue attracts dozens of studies, so you can take your pick. Phrases like ‘Research shows that . . .’, ‘A study finds that . . .’, or ‘There is clear academic evidence that . . .’ are commonly bandied around as proof, but they’re often meaningless.

Second, sources we consider reliable, such as a government report, may still be untrustworthy. Any report – by policymakers, consultancies, and even academics like me – is written by humans, and humans have their biases. The Committee may have already felt that pay was too high and needed to be reined in, which is why they launched the inquiry in the first place.

This isn’t just an isolated case. Newspapers publish articles highlighting the blockbuster findings of a study that doesn’t even exist. Companies release research that has no actual data behind it; it just assumes its results. Universities circulate reports declaring game-changing conclusions, when their tests in fact found nothing. Yet if readers want these claims to be true, they accept them unquestioningly.

The problem extends far beyond business. Misinformation
surrounds us and affects our everyday lives – how we vote, learn a skill or improve our health. In the 2016 Brexit referendum, buses paraded the claim that European Union membership cost the UK £350 million per week. The actual figure was £250 million, or £120 million after deducting the amount the EU gives back to the UK.7 People believe the ‘10,000 hours rule’ that you can master any skill with 10,000 hours of practice. Yet the research it’s based on was limited to violinists, didn’t measure their skill, and didn’t even mention 10,000 hours. In 1988, the journal *Nature* published a paper touting the effectiveness of homeopathy, a treatment using heavily diluted substances that supposedly transfer their properties to water.8 But several other studies found no improvements, and scientific consensus is now that homeopathy is ineffective for any disease or condition.9

These examples show how we’re all affected by research, even if we never read a single academic paper. Each time we pick up a self-help book, browse through the latest *Men’s Fitness*, *Women’s Health* or *Runner’s World*, or open an article shared on LinkedIn, X or Facebook, we’re reading about research. Whenever we listen to an expert’s opinion on whether to invest in crypto, how to teach our kids to read, or why inflation is so high, we’re hearing about research. And information is far broader than research – our news feeds are bombarded not only with ‘New study finds that . . .’ but also anecdotes like ‘How daily journalling boosted my mental health’, hunches such as ‘Five tips to ace your job interview’, and speculation like ‘Why we’ll colonize Mars by 2050’.10 Blindly following this advice, you could find yourself sicker, poorer and unemployed.

In some cases, misinformation can be fatal. In March 2020, as the coronavirus pandemic was breaking out, US President Donald Trump tweeted that hydroxychloroquine might be a cure, proclaiming it ‘one of the biggest game changers in the
Introduction

history of medicine’. One woman noticed ‘chloroquine’ on the label of her fish-tank cleaner; as she told NBC News, ‘I saw it sitting on the back shelf and thought “Hey, isn’t that the stuff they’re talking about on TV?”’ She and her husband drank it, hoping it would protect them from the virus. The woman became violently sick but vomited up enough of the chemical to survive. Her husband wasn’t so lucky and died just after getting to hospital.

What’s striking in all the above cases is that the solution is simple – to check the facts. It seems obvious to ensure a drug is safe before swallowing it, to verify a study exists before writing about it, and to doubt the side of a bus as a source of information. And the people making the misjudgements are more than capable of checking the facts. If I share a study on LinkedIn whose findings people don’t like, there’s no shortage of comments from executives, investors and fellow academics pointing out how it might be flawed – exactly the kind of discerning engagement I’m hoping to prompt. But do I see the same critical thinking when I post a paper that finds their favour? Unfortunately not: they lap it up uncritically.

One of my favourite toys growing up was Action Man. This UK character was based on the GI Joe set of military figures in the US, which were accompanied by a cartoon series. Each episode closed with a scene where a GI Joe figure taught kids a lesson – don’t give your address to strangers, don’t pet unfamiliar animals, do wear sun protection. The children in the cartoon exclaimed, ‘Now I know!’ to which the GI Joe replied, ‘And knowing is half the battle.’ This aimed to highlight the power of knowledge – with it, you’re already halfway there.

But there’s another way to interpret that statement: the glass is half empty, not just half full. Even with knowledge,
you’ve only won half the battle.\textsuperscript{12} Knowing how to check the facts isn’t enough. The people who made the above mistakes knew what to do in the cold light of day, yet their biases took over and prevented them applying their knowledge.

As a university academic for two decades, I’ve seen first-hand how important rigour is when producing research. At the Massachusetts Institute of Technology, where I did my Ph.D.; Wharton, the business school of the University of Pennsylvania, where I was first a professor; and London Business School, where I now teach, I’ve been held to gruelling standards in my own work. Journals correctly refused to publish my papers until I’d completely nailed the results, addressed alternative explanations for my findings, and toned down any claims that weren’t fully supported by the data. Sometimes it took five years of toil and sweat to get a study above the bar for publication.

This isn’t just my experience as a producer of research; it’s also what I’ve seen as a gatekeeper. As the Managing Editor of a leading academic journal, the Review of Finance, I’ve been on the other side for six years. After authors submit a paper for potential publication, I send it to ‘peer reviewers’ (independent experts) and ask their advice on whether to accept it. I’ve been gratified by the extreme care with which they scrutinize a manuscript. And I’ve had to apply the same exacting standards myself, rejecting papers that would be highly influential if taken at their word, because their results just weren’t identified precisely enough.

While one foot is firmly in academia, my second is deeply rooted in practice, advising companies, investors and policymakers based on the findings of research. So I’ve observed how the painstaking care with which papers are written goes out of the window when they’re read and emotion takes over. My main field is sustainable business, a field with strong opinions that
polarize across political lines. Those on the left tend to believe that ethical stocks always outperform, so they’ll trumpet any study which claims this. Many right-wingers retort that sustainable companies are distracted from the bottom line; some US lawmakers have banned state pension funds from investing in them. Sustainability is also a highly practical topic, so I’ve seen how academic rigour isn’t just an academic concept but affects how CEOs run their companies, investors choose which firms to finance, and policymakers decide what laws to pass.

In 2017 I was invited to give a second TEDx talk. It was a great opportunity to reach a wide audience and my instinct was to use it to share my work – as most professors do, and as I indeed did in my first talk. Then I had a thought: what if, instead of pitching my own research, I spoke up for research in general? The whole mission of TED is to promote ‘ideas worth spreading’, but this mission is under threat if how far an idea spreads depends on whether people like it rather than whether it’s true. And it’s not just the TED/TEDx stage: anyone with a newspaper column, social media platform, or YouTube channel can broadcast what they want and claim there’s data to support it.

So I spoke about how discerning we must be with evidence – how our biases can lead us to fall for something false or reject something real, and how we should judge a study by its carefulness, not its claims. I was grateful when it was elevated to a mainstage TED talk, ‘What to trust in a post-truth world’, because I hoped it might move the needle, even slightly, from fiction to fact.

Yet misinformation has arguably become worse. Public discourse is increasingly polarized, with opinions formed on ideology, not evidence. The most pressing issues of our time, such as climate change, inequality and global health, are steeped
Introduction

in falsehoods. In the past, we knew what the reliable sources were, such as a doctor or medical textbook for health advice and an encyclopaedia for general knowledge. Now one half of Americans obtain news ‘often’ or ‘sometimes’ from social media, where false stories spread further, faster and deeper than the truth because they’re more attention-grabbing.

And biases exist even among people who’ve seen the talk and should know better. Some companies invited me to present an extended version to their employees, supposedly to promote critical thinking, only to strike out a couple of ‘inconvenient truths’ from the slide deck – because they didn’t want them to be true.

In today’s post-truth world, it’s more important than ever to separate myth from reality. This book is a practical guide to help you think smarter, sharper and more critically – on topics such as how to run a company and invest your money, how to improve your health and develop good habits, how to feed your child and educate a nation’s children, what drives global warming or the spread of coronavirus, and which policies lawmakers should pass and voters should support. We’ll overturn some widely accepted ideas, and in doing so learn simple ways to spot if a claim is supported by the evidence. We’ll uncover the problems with the case study method that pervades the world’s leading business schools, viral TED talks and bestselling books. We’ll see how we can be fooled even by large-scale data – even if hundreds of datapoints all tell the same story.

But knowledge is only half the battle. Having knowledge isn’t enough: we need to know when to use it and how to use it. Why do we leave our learnings at the door and rush to accept a statement at face value? Without highlighting the biases that cause us to forget our knowledge, a book that simply passes on
Introduction

knowledge is incomplete. It’s like teaching a first-aider how to perform CPR but not how to spot if someone needs it.

Sun Tzu’s *The Art of War* stresses that you should ‘know your enemy’ before drawing up battle plans. So we’ll start in Part I (‘The Biases’) by learning about our enemy. We’ll take a deep dive into two psychological biases – confirmation bias and black-and-white thinking – that are the two biggest culprits in causing us to misinterpret information.

In Part II (‘The Problems’), we’ll study the consequences of these biases. They lead us to climb the Ladder of Misinference shown below:

![The Ladder of Misinference](image-url)

*Figure 1. The Ladder of Misinference*
Introduction

We accept a statement as fact, even if it’s not accurate – the information behind it may be unreliable and may even be misquoted in the first place. We accept a fact as data, even if it’s not representative but a hand-picked example – an exception that doesn’t prove the rule. We accept data as evidence, even if it’s not conclusive and many other interpretations exist. We accept evidence as proof, even if it’s not universal and doesn’t apply in other settings.

Importantly, checking the facts only saves us from the first misstep up the ladder. Even if the facts are correct, we may interpret them erroneously, by over-extrapolating from a single anecdote or ignoring alternative explanations. The word ‘lie’ is typically reserved for an outright falsehood made deliberately, and to accuse someone of lying or call them a liar is a serious allegation. But we need to take a broader view of what a lie can involve so that we can guard against its many manifestations.

‘Lie’ is simply the opposite of ‘truth’. Someone can lie to us by hiding contradictory information, not gathering it in the first place, or drawing invalid conclusions from valid data. The Select Committee’s claim that ‘The TUC states that . . .’ is strictly correct – but it’s still a lie, as it suggests the TUC’s statement was true when the Committee knew it had been debunked. Lies also have many causes – some are wilful and self-interested; others are a careless or accidental result of someone’s biases; and yet more arise from well-intentioned but excessive enthusiasm to further a cause they deem worthy.

This wider definition of ‘lie’ highlights how regulation can’t save us from being deceived – it can only make someone state the facts truthfully; it can’t stop him claiming invalid implications from them. It’s up to us to protect ourselves. Even if a report has been signed off by the government, a paper has been published by a scientific journal or a book has been
Introduction

endorsed by a Nobel Laureate, they should all carry the same health warning: ‘May contain lies’.

Part II thus provides a practical guide to help us discern whether a statement really is fact, a fact truly is data, data genuinely is evidence, and evidence actually is proof. These tips are simple and non-technical, and can be applied even if you’re time-pressed and don’t have the capacity to dig into the weeds of a study.

To distinguish between truth and lies, and gain a deeper understanding of the world around us, we need to do more than just interpret statements, facts, data and evidence correctly. Part III (‘The Solutions’) goes beyond the ladder. It moves past evaluating single studies to learning scientific consensus, and assessing other sources of information such as books, newspaper articles, and even our friends and colleagues. From learning how to think critically as individuals, we’ll explore how to create smart-thinking organizations that harness our colleagues’ diversity of thought, overcome groupthink and embrace challenge. We’ll finally examine how to build intelligent societies through teaching critical thinking to our children, taking the politics out of issues such as climate change, and playing our part in the information we share and ignore.

The Appendix provides a checklist of questions to evaluate statements, facts, data and evidence, applying the learnings of Part II. At the start, we might literally go through every question. Over time, the way of thinking that the book develops – challenging what we’d like to believe, listening open-mindedly to what we don’t and staying alert to our biases – should become ingrained so we no longer need to follow a script. A novice tennis player thinks, ‘First I split-step, then I turn my body so it’s square to the net, then I take a
backswing and follow through over my opposite shoulder,’ but after a while it becomes second nature.

While this book aims to be practical, it also seeks to be realistic. It’s impossible to overcome our biases in every situation and correctly evaluate every piece of information; the range of ways we can be deceived may seem overwhelming. Our goal is not to become perfect, only better. A baseball player who improves his batting average from 0.280 to 0.320 will leap from a Major League starter to a Hall of Famer, even though he’s still well below 1.000. Critical thinking is a polar star – you might never get there, but it guides you.

Now more than ever, we have easy access to scientific research by the world’s leading minds, yet it’s drowned out by fallacies, fabrications and falsehoods. Knowing what to trust and what to doubt will help us make shrewder decisions, comprehend better how the world works, and spread knowledge rather than unwittingly sharing misinformation. This in turn allows us and our families to lead healthy and fulfilling lives, the businesses we work for and invest in to solve the world’s biggest problems, and the nations we’re citizens of to prosper and thrive. By recognizing our own biases, we can view a contrary perspective as something to learn from rather than fight, build bridges across ideological divides to find common ground, and evolve from simplistic thinking to seeing the world in all its magnificence.