



FRANK PASQUALE

THE BLACK BOX SOCIETY

The Secret Algorithms
That Control Money
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Harvard University Press

Cambridge, Massachusetts
London, England

2015

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Printed in the United States of America

Library of Congress Cataloging-in-Publication Data

Pasquale, Frank.

The black box society : the secret algorithms that control money and
information / Frank Pasquale.

pages cm

Includes bibliographical references and index.

ISBN 978-0-674-36827-9

1. Power (Social sciences) 2. Elite (Social sciences)
3. Knowledge, Theory of. 4. Observation (Psychology) I. Title.
HN49.P6.P375 2015
303.3—dc23

2014013480

1

INTRODUCTION—THE NEED TO KNOW

EVERYBODY KNOWS the story about the man crawling intently around a lamppost on a dark night. When a police officer comes along and wants to know what he's doing, he says he's looking for his keys. "You lost them here?" asks the cop. "No," the seeker replies, "but this is where the light is." This bromide about futility has lately taken on a whole new meaning as a metaphor for our increasingly enigmatic technologies.

There's a noble tradition among social scientists of trying to clarify how power works: who gets what, when, where, and why.¹ Our common life is explored in books like *The Achieving Society*, *The Winner-Take-All Society*, *The Good Society*, and *The Decent Society*. At their best, these works also tell us why such inquiry matters.²

But efforts like these are only as good as the information available. We cannot understand, or even investigate, a subject about which nothing is known. Amateur epistemologists have many names for this problem. "Unknown unknowns," "black swans," and "deep secrets" are popular catchphrases for our many areas of social blankness.³ There is even an emerging field of "agnotology" that studies the "structural production of ignorance, its diverse causes and conformations, whether brought about by neglect, forgetfulness, myopia, extinction, secrecy, or suppression."⁴

Gaps in knowledge, putative and real, have powerful implications, as do the uses that are made of them. Alan Greenspan, once the most powerful central banker in the world, claimed that today's markets are driven by an "unredeemably opaque" version of Adam Smith's "invisible hand," and that no one (including regulators) can ever get "more than a glimpse at the internal workings of the simplest of modern financial systems." If this is true, libertarian policy would seem to be the only reasonable response. Friedrich von Hayek, a preeminent theorist of *laissez-faire*, called the "knowledge problem" an insuperable barrier to benevolent government interventions in the economy.⁵

But what if the "knowledge problem" is not an intrinsic aspect of the market, but rather is deliberately encouraged by certain businesses? What if financiers keep their doings opaque on purpose, precisely to avoid or to confound regulation? That would imply something very different about the merits of deregulation.

The challenge of the "knowledge problem" is just one example of a general truth: What we do and don't know about the social (as opposed to the natural) world is not inherent in its nature, but is itself a function of social constructs. Much of what we can find out about companies, governments, or even one another, is governed by law. Laws of privacy, trade secrecy, the so-called Freedom of Information Act—all set limits to inquiry. They rule certain investigations out of the question before they can even begin. We need to ask: To whose benefit?

Some of these laws are crucial to a decent society. No one wants to live in a world where the boss can tape our bathroom breaks. But the laws of information protect much more than personal privacy. They allow pharmaceutical firms to hide the dangers of a new drug behind veils of trade secrecy and banks to obscure tax liabilities behind shell corporations. And they are much too valuable to their beneficiaries to be relinquished readily.

Even our political and legal systems, the spaces of our common life that are supposed to be the most open and transparent, are being colonized by the logic of secrecy. The executive branch has been lobbying ever more forcefully for the right to enact and enforce "secret law" in its pursuit of the "war on terror," and voters contend in

an electoral arena flooded with “dark money”—dollars whose donors, and whose influence, will be disclosed only *after* the election, if at all.⁶

But while powerful businesses, financial institutions, and government agencies hide their actions behind nondisclosure agreements, “proprietary methods,” and gag rules, our own lives are increasingly open books. Everything we do online is recorded; the only questions left are to whom the data will be available, and for how long. Anonymizing software may shield us for a little while, but who knows whether trying to hide isn’t itself the ultimate red flag for watchful authorities? Surveillance cameras, data brokers, sensor networks, and “supercookies” record how fast we drive, what pills we take, what books we read, what websites we visit. The law, so aggressively protective of secrecy in the world of commerce, is increasingly silent when it comes to the privacy of persons.

That incongruity is the focus of this book. How has secrecy become so important to industries ranging from Wall Street to Silicon Valley? What are the social implications of the invisible practices that hide the way people and businesses are labeled and treated? How can the law be used to enact the best possible balance between privacy and openness? To answer these questions is to chart a path toward a more intelligible social order.

But first, we must fully understand the problem. The term “black box” is a useful metaphor for doing so, given its own dual meaning. It can refer to a recording device, like the data-monitoring systems in planes, trains, and cars. Or it can mean a system whose workings are mysterious; we can observe its inputs and outputs, but we cannot tell how one becomes the other. We face these two meanings daily: tracked ever more closely by firms and government, we have no clear idea of just how far much of this information can travel, how it is used, or its consequences.⁷

The Power of Secrecy

Knowledge is power. To scrutinize others while avoiding scrutiny oneself is one of the most important forms of power.⁸ Firms seek out intimate details of potential customers’ and employees’ lives, but give regulators as little information as they possibly can about

their own statistics and procedures.⁹ Internet companies collect more and more data on their users but fight regulations that would let those same users exercise some control over the resulting digital dossiers.

As technology advances, market pressures raise the stakes of the data game. Surveillance cameras become cheaper every year; sensors are embedded in more places.¹⁰ Cell phones track our movements; programs log our keystrokes. New hardware and new software promise to make “quantified selves” of all of us, whether we like it or not.¹¹ The resulting information—a vast amount of data that until recently went unrecorded—is fed into databases and assembled into profiles of unprecedented depth and specificity.

But to what ends, and to whose? The decline in personal privacy might be worthwhile if it were matched by comparable levels of transparency from corporations and government. But for the most part it is not. Credit raters, search engines, major banks, and the TSA take in data about us and convert it into scores, rankings, risk calculations, and watch lists with vitally important consequences. But the proprietary algorithms by which they do so are immune from scrutiny, except on the rare occasions when a whistleblower litigates or leaks.

Sometimes secrecy is warranted. We don’t want terrorists to be able to evade detection because they know exactly what Homeland Security agents are looking out for.¹² But when every move we make is subject to inspection by entities whose procedures and personnel are exempt from even remotely similar treatment, the promise of democracy and free markets rings hollow. Secrecy is approaching critical mass, and we are in the dark about crucial decisions. Greater openness is imperative.

Reputation, Search, Finance

At the core of the information economy are Internet and finance companies that accumulate vast amounts of digital data, and with it intimate details of their customers’—our—lives. They use it to make important decisions about us and to influence the decisions we make for ourselves. But what do we know about them? A bad credit score may cost a borrower hundreds of thousands of dollars, but he will never understand exactly how it was calculated. A predictive

analytics firm may score someone as a “high cost” or “unreliable” worker, yet never tell her about the decision.

More benignly, perhaps, these companies influence the choices we make ourselves. Recommendation engines at Amazon and YouTube affect an automated familiarity, gently suggesting offerings they think we’ll like. But don’t discount the significance of that “perhaps.” The economic, political, and cultural agendas behind their suggestions are hard to unravel. As middlemen, they specialize in shifting alliances, sometimes advancing the interests of customers, sometimes suppliers: all to orchestrate an online world that maximizes their own profits.

Financial institutions exert direct power over us, deciding the terms of credit and debt. Yet they too shroud key deals in impenetrable layers of complexity. In 2008, when secret goings-on in the money world provoked a crisis of trust that brought the banking system to the brink of collapse, the Federal Reserve intervened to stabilize things—and kept key terms of those interventions secret as well. Journalists didn’t uncover the massive scope of its interventions until late 2011.¹³ That was well after landmark financial reform legislation had been debated and passed—*without* informed input from the electorate—and then watered down by the same corporate titans whom the Fed had just had to bail out.

Reputation. Search. Finance. These are the areas in which Big Data looms largest in our lives. But too often it looms invisibly, undermining the openness of our society and the fairness of our markets. Consider just a few of the issues raised by the new technologies of ranking and evaluation:

- Should a credit card company be entitled to raise a couple’s interest rate if they seek marriage counseling? If so, should cardholders know this?
- Should Google, Apple, Twitter, or Facebook be able to shut out websites or books entirely, even when their content is completely legal? And if they do, should they tell us?
- Should the Federal Reserve be allowed to print unknown sums of money to save banks from their own scandalous behavior? If so, how and when should citizens get to learn what’s going on?

- Should the hundreds of thousands of American citizens placed on secret “watch lists” be so informed, and should they be given the chance to clear their names?

The leading firms of Wall Street and Silicon Valley are not alone in the secretiveness of their operations, but I will be focusing primarily on them because of their unique roles in society. While accounting for “less than 10% of the value added” in the U.S. economy in the fourth quarter of 2010, the finance sector took 29 percent—\$57.7 billion—of profits.¹⁴ Silicon Valley firms are also remarkably profitable, and powerful.¹⁵ What finance firms do with money, leading Internet companies do with attention. They direct it toward some ideas, goods, and services, and away from others. They organize the world for us, and we have been quick to welcome this data-driven convenience. But we need to be honest about its costs.

Secrecy and Complexity

Deconstructing the black boxes of Big Data isn’t easy. Even if they were willing to expose their methods to the public, the modern Internet and banking sectors pose tough challenges to our understanding of those methods. The conclusions they come to—about the productivity of employees, or the relevance of websites, or the attractiveness of investments—are determined by complex formulas devised by legions of engineers and guarded by a phalanx of lawyers.

In this book, we will be exploring three critical strategies for keeping black boxes closed: “real” secrecy, legal secrecy, and obfuscation. *Real secrecy* establishes a barrier between hidden content and unauthorized access to it. We use real secrecy daily when we lock our doors or protect our e-mail with passwords. *Legal secrecy* obliges those privy to certain information to keep it secret; a bank employee is obliged both by statutory authority and by terms of employment not to reveal customers’ balances to his buddies.¹⁶ *Obfuscation* involves deliberate attempts at concealment when secrecy has been compromised. For example, a firm might respond to a request for information by delivering 30 million pages of documents, forcing its investigator to waste time looking for a needle in a haystack.¹⁷ And

the end result of both types of secrecy, and obfuscation, is *opacity*, my blanket term for remediable incomprehensibility.¹⁸

Detailed investment prospectuses, for instance, can run to dozens or hundreds of pages. They can refer to other documents, and those to still others. There may be conflicts among the documents that the original source references.¹⁹ Anyone really trying to understand the investment is likely to have to process thousands of pages of complicated legal verbiage—some of which can be quite obfuscatory. The same holds for accounting statements. When law professor Frank Partnoy and Pulitzer Prize-winning journalist Jesse Eisinger teamed up to explore “what’s inside America’s banks” in early 2013, they were aghast at the enduring opacity. They reported on the banks as “‘black boxes’ that may still be concealing enormous risks—the sort that could again take down the economy.”²⁰ Several quotes in the article portrayed an American banking system still out of control five years after the crisis:

- “There is no major financial institution today whose financial statements provide a meaningful clue” about its risks, said one hedge fund manager.
- “After serving on the [Financial Accounting Standards] board [FASB],” said Don Young, “I no longer trust bank accounting.”
- Another former FASB member, asked if he trusted bank accounting, answered: “Absolutely not.”²¹

These quotes came five years after the financial crisis and three years after the Dodd-Frank Act, a gargantuan piece of legislation that comprehensively altered banking law. Financial crises result when a critical mass of investors act on that distrust, and their skepticism cascades throughout the system. And when governments step in with their “bailouts” and “liquidity facilities,” they add new layers of complexity to an already byzantine situation.

In the case of technology companies, complexity is not as important as secrecy. However sprawling the web becomes, Google’s search engineers are at least working on a “closed system”; their own company’s copies of the Internet. Similarly, those in charge of Twitter and Facebook “feeds” have a set body of information to

work with. Their methods are hard to understand primarily because of a mix of real and legal secrecy, and their scale. Interlocking technical and legal prohibitions prevent anyone outside such a company from understanding fundamental facts about it.

Activists often press for transparency as a solution to the black box issues raised in this book. In many cases, sunshine truly is the “best disinfectant.” However, transparency may simply provoke complexity that is as effective at defeating understanding as real or legal secrecy. Government has frequently stepped in to require disclosure and “plain language” formats for consumers. But financiers have parried transparency rules with more complex transactions. When this happens, without substantial gains in efficiency, regulators should step in and limit complexity. Transparency is not just an end in itself, but an interim step on the road to intelligibility.

The Secret Judgments of Software

So why does this all matter? It matters because authority is increasingly expressed algorithmically.²² Decisions that used to be based on human reflection are now made automatically. Software encodes thousands of rules and instructions computed in a fraction of a second. Such automated processes have long guided our planes, run the physical backbone of the Internet, and interpreted our GPSes. In short, they improve the quality of our daily lives in ways both noticeable and not.

But where do we call a halt? Similar protocols also influence—invisibly—not only the route we take to a new restaurant, but which restaurant Google, Yelp, OpenTable, or Siri recommends to us. They might help us find reviews of the car we drive. Yet choosing a car, or even a restaurant, is not as straightforward as optimizing an engine or routing a drive. Does the recommendation engine take into account, say, whether the restaurant or car company gives its workers health benefits or maternity leave? Could we prompt it to do so? In their race for the most profitable methods of mapping social reality, the data scientists of Silicon Valley and Wall Street tend to treat recommendations as purely technical problems. The values and prerogatives that the encoded rules enact are hidden within black boxes.²³

The most obvious question is: Are these algorithmic applications fair? Why, for instance, does YouTube (owned by Google) so consistently beat out other video sites in Google's video search results? How does one particular restaurant or auto stock make it to the top of the hit list while another does not? What does it mean when Internet retailers quote different prices for the same product to different buyers? Why are some borrowers cut slack for a late payment, while others are not?

Defenders of the status quo say that results like these reflect a company's good-faith judgment about the quality of a website, an investment, or a customer. Detractors contend that they cloak self-serving appraisals and conflicts of interest in a veil of technological wizardry. Who is right? It's anyone's guess, as long as the algorithms involved are kept secret. Without knowing what Google actually *does* when it ranks sites, we cannot assess when it is acting in good faith to help users, and when it is biasing results to favor its own commercial interests. The same goes for status updates on Facebook, trending topics on Twitter, and even network management practices at telephone and cable companies. All these are protected by laws of secrecy and technologies of obfuscation.

The One-Way Mirror

With so much secrecy so publicly in place, it is easy for casual observers to conclude that there is a rough parity between the informational protection of individuals and civil associations and those of corporations and government. It is comforting to think that our personal bank records are as secure as the bank's own secrets. But I will attempt to overthrow this assumption. We do not live in a peaceable kingdom of private walled gardens; the contemporary world more closely resembles a one-way mirror. Important corporate actors have unprecedented knowledge of the minutiae of our daily lives, while we know little to nothing about how they use this knowledge to influence the important decisions that we—and they—make.

Furthermore, even as critical power over money and new media rapidly concentrates in a handful of private companies, we remain largely ignorant of critical ways in which these companies interact

(and conflict) with public powers. Though this book is primarily about the private sector, I have called it *The Black Box Society* (rather than *The Black Box Economy*) because the distinction between state and market is fading. We are increasingly ruled by what former political insider Jeff Connaughton called “The Blob,” a shadowy network of actors who mobilize money and media for private gain, whether acting officially on behalf of business or of government.²⁴ In one policy area (or industry) after another, these insiders decide the distribution of society’s benefits (like low-interest credit or secure employment) and burdens (like audits, wiretaps, and precarity).

Admittedly, as Jon Elster has written in his book *Local Justice*, there is no perfectly fair way to allocate opportunities.²⁵ But a market-state increasingly dedicated to the advantages of speed and stealth crowds out even the most basic efforts to make these choices fairer. Technocrats and managers cloak contestable value judgments in the garb of “science”: thus the insatiable demand for mathematical models that reframe subtle and subjective conclusions (such as the worth of a worker, service, article, or product) as the inevitable dictate of salient, measurable data.²⁶ Big data driven decisions may lead to unprecedented profits. But once we use computation not merely to exercise power over things, but also over people, we need to develop a much more robust ethical framework than “the Blob” is now willing to entertain.

The Secrecy of Business and the Business of Secrecy

Today’s finance and Internet companies feverishly sort, rank, and rate. They say they keep techniques strictly secret in order to preserve valuable intellectual property—but their darker motives are also obvious. For example, litigation has revealed that some drug companies have cherry-picked the most positive studies for publication, hiding those with serious health or safety implications.²⁷ Journalists are prying open Wall Street’s pre-financial crisis black boxes to this day.²⁸ The Sunlight Foundation, Center for Effective Government, AllTrials.net, and Transparency International press for openness.

Politicians are responding, and try to improve disclosure here and there. But they must be cautious. When a gadfly proves too inconve-

nient, companies can band together in a super PAC, funding attacks on the would-be reformer without having to reveal what they are doing until well after the election.²⁹

Asked about Google's privacy practices, former CEO Eric Schmidt once said that "Google policy is to get right up to the creepy line and not cross it." It is probably more accurate to say that he and other Silicon Valley leaders don't want to be *caught* crossing the creepy line.³⁰ As long as secrecy can be used to undermine market competition and law enforcement, they will be emboldened to experiment with ever creepier, more intrusive, and even exploitative practices.

Looking Back

The quest for a more transparent society—more easily understood, and more open about its priorities—has animated leading reformers in the United States. Louis Brandeis's comment that "sunlight is said to be the best of disinfectants," so often cited today, is a century old, dating back to business scandals of the Gilded Age eerily similar to today's casino capitalism.³¹ Muckraking journalists and trust-busters of the Progressive Era shamed robber barons by exposing their misdeeds.³² They targeted politicians, too: the Publicity Act of 1910 mandated disclosure of campaign donations.³³

Many states of the time took up similar reforms. Voters wanted politics and business subject to public scrutiny. After shady commercial practices surged again in the 1920s, the New Deal echoed and amplified Progressivism. Congress, disgusted by the hucksters who paved the way for the great crash of 1929, imposed sweeping new disclosure obligations in the Securities Act of 1933 and the Securities Exchange Act of 1934. New legislation created the Federal Communications Commission and gave it plenary power to investigate abuses in the telegraph and radio industries.³⁴ New Deal agencies revealed the inner workings of critical industries.³⁵

Government balanced these new powers by opening itself up in important ways. For example, the Administrative Procedure Act (APA) of 1947 forced agencies to give the public notice and a chance to comment before they imposed important rules. Reformers built on the APA with the 1966 Freedom of Information Act, which opened up many government records.³⁶

In the 1960s, a broad coalition of interests fought both government and corporate secrecy in the name of citizen empowerment and consumer protection.³⁷ Perhaps their most enduring legacy was the establishment of procedures of openness. For example, the National Environmental Policy Act required major federal projects to include Environmental Impact Statements that would reveal likely effects on air, water, flora, and fauna. Agencies ranging from the Food and Drug Administration to the Consumer Product Safety Commission now make daily activities less dangerous by revealing the risks of things we purchase.³⁸

But there was always pushback. By the late 1960s, businesses were successfully challenging scrutiny from what they branded the “nanny state.” When the Environmental Protection Agency wanted to release data on the composition of some pesticides, for example, Monsanto fought back. It won a Supreme Court ruling that prevented the disclosure on the grounds that the formulations were a “trade secret” (a form of intellectual property we’ll explore in more detail later). Such rulings chilled many disclosure initiatives, including investigations of Philip Morris’s cigarettes and frackers’ chemicals.³⁹

Confidence in government waned during the stagflation of the 1970s, and business lobbyists seized the opportunity to argue that journalists could do a better job at exposing and punishing corporate wrongdoing than bureaucrats. With zealous investigators ferreting out bad behavior, why bother to require reports? Establishment figures pooh-poohed complaints that banks were becoming too big, complex, and rapacious. “Sophisticated investors” could understand the risks, they insisted, and banks themselves would avoid duplicity to preserve their reputations.⁴⁰

Companies tried to maintain an advantage over their competitors by classifying innovative work as “proprietary” or “confidential.” As computerized exchanges made it possible to gain or lose fortunes within seconds, information advantage became critical throughout the economy. Some economists began to question the wisdom of regulating, or even monitoring, the fast-moving corporate world. Some failed to disclose that they were being paid for “consulting” by the same secretive corporations their writings supported. Business

schools taught MBAs the basics of game theory, which stressed the importance of gaining an information advantage over rivals.⁴¹

Over the last decade, fortunes made via stealth techniques made secrecy even sexier. Google rose to the top of the tech pack while zealously guarding its “secret sauce”—the complex algorithms it used to rank sites. Investment banks and hedge funds made billions of dollars by courting sellers who didn’t understand the value of what they were holding and buyers who didn’t understand the problems with what they were purchasing.⁴²

While neoliberals were vitiating the regulatory state’s ability to expose (or even understand) rapidly changing business practices, neoconservatives began to advance a wall of secrecy for the deep state.⁴³ In the Nixon administration, Dick Cheney and Donald Rumsfeld were already chafing at the idea that Congress could force the executive branch to explain its foreign engagements and strategies. When they renewed their executive service in the George W. Bush administration, they expanded the executive branch’s freedom to maneuver (and its power to avoid oversight).⁴⁴ After 9/11, they pressed even harder for government secrecy, claiming that the only way to win the “war on terror” was for the state to act as clandestinely as its shadowy enemies.⁴⁵

The Obama administration embraced the expansion of executive secrecy, with far-reaching (and occasionally surreal) results. By 2010, leading intelligence agency experts could not even estimate the overall costs of the U.S. antiterrorism effort; nor could they map the extent of the surveillance apparatus they had built.⁴⁶ And their fumbling responses to questions were positively enlightening in comparison with the silence of defense officials funded by the “black budget,” whose appropriations only a sliver of Congress and responsible officials are privy to understand.⁴⁷ Big government now stands together with security contractors to manage strategic surprise.

Thus the openness mantra of Progressive Era reformers has been neatly reversed in favor of a Faustian (and credulous) bargain: just keep us safe and we won’t ask about the details. “Nanny state” takes on a very different connotation in this context.

Things weren’t supposed to turn out this way. Little more than a decade ago, the Internet was promising a new era of transparency,

in which open access to information would result in extraordinary liberty. Law professor Glenn Reynolds predicted that “an army of Davids” would overthrow smug, self-satisfied elites. Space physicist David Brin believed that new technology would finally answer the old Roman challenge, “Who will guard the guardians?” But the powerful actors of business, finance, and search did not meekly submit to the fishbowl vision of mutual surveillance that Brin prophesied in *The Transparent Society*. Instead, they deployed strategies of obfuscation and secrecy to consolidate power and wealth.⁴⁸ Their opaque technologies are spreading, unmonitored and unregulated.

The Shape of the Book

In this book, I will explore the business practices of leading Internet and finance companies, focusing on their use of proprietary reputation, search, and finance technologies in our often chaotic information environment. In some cases, they enable great gains in efficiency. In others, however, they undermine both economic growth and individual rights.

The success of individuals, businesses, and their products depends heavily on the synthesis of data and perceptions into *reputation*. In ever more settings, reputation is determined by secret algorithms processing inaccessible data. Few of us appreciate the extent of ambient surveillance, and fewer still have access either to its results—the all-important profiles that control so many aspects of our lives—or to the “facts” on which they are based. Chapter 2 illustrates how broadly the new technologies of reputation have infiltrated society.⁴⁹

The more we rely on search engines and social networks to find what we want and need, the more influence they wield. The power to include, exclude, and rank is the power to ensure that certain public impressions become permanent, while others remain fleeting.⁵⁰ How does Amazon decide which books to prioritize in searches? How does it ferret out fake or purchased reviews? Why do Facebook and Twitter highlight some political stories or sources at the expense of others?⁵¹ Although internet giants say their algorithms are scientific and neutral tools, it is very difficult to verify those claims.⁵² And while they have become critical economic infrastructure, trade secrecy law permits managers to hide their methodolo-

gies, and business practices, deflecting scrutiny.⁵³ Chapter 3 examines some personal implications of opaque search technology, along with larger issues that it raises in business and law.

Like the reputation and search sectors, the finance industry has characterized more and more decisions as computable, programmable procedures. Big data enables complex pattern recognition techniques to analyze massive data sets. Algorithmic methods of reducing judgment to a series of steps were supposed to rationalize finance, replacing self-serving or biased intermediaries with sound decision frameworks. And they did reduce some inefficiencies. But they also ended up firmly building in some dubious old patterns of credit castes and corporate unaccountability.⁵⁴ The black boxes of finance replaced familiar old problems with a triple whammy of technical complexity, real secrecy, and trade secret laws. They contributed to the financial crisis of 2008, according to the *Financial Times*'s John Gapper, because "the opacity and complexity . . . let deception, overpricing and ultimately fraud flourish."⁵⁵ Perhaps worse, by naturalizing these (avoidable) features of our social landscape, unregulated financial secrecy is starting to give them a patina of inevitability. Chapter 4 examines the role of opaque models and practices in financial markets, along with the challenges they present to citizens, to society, and to the law.

In his book *Turing's Cathedral*, George Dyson quipped that "Facebook defines who we are, Amazon defines what we want, and Google defines what we think."⁵⁶ We can extend that epigram to include *finance*, which defines what we have (materially, at least), and *reputation*, which increasingly defines our opportunities. Leaders in each sector aspire to make these decisions without regulation, appeal, or explanation. If they succeed, our fundamental freedoms and opportunities will be outsourced to systems with few discernible values beyond the enrichment of top managers and shareholders.

This book charts two paths of resistance. Chapter 5 recommends several legal strategies for checking the worst abuses by black box firms. Chapter 6 makes the case for a new politics and economics of reputation, search, and finance, based on the ideal of an intelligible society. It would be foolish to hope for immediate traction in today's gridlocked political environment. But agencies would need to make "all the right moves" within existing legal frameworks to cabin black

box practices. Moreover, those concerned about the power of Silicon Valley and Wall Street need to do more than complain about the limited availability of crucial information. We can imagine a future in which the power of algorithmic authority is limited to environments where it can promote fairness, freedom, and rationality.

We do not have to live in a world where hidden scores determine people's fates, or human manipulations of the stock market remain as inscrutable as the "invisible hand." We should not have to worry that the fates of individuals, businesses, and even our financial systems are at the mercy of hidden databases, dubious scores, and shadowy bets. The same technological and legal revolutions that have so far eviscerated personal privacy can be used to protect it and to advance, rather than curtail, our freedoms and our understanding of the social world. Directed at the right targets, data mining and pervasive surveillance might even prevent the kinds of financial crises and massive misallocations of resources that have devastated the U.S. economy over the past decade.

We need to promote public values in Internet and finance companies, drawing on best practices in other, more regulated sectors. In health care, for example, regulators are deploying technologically savvy contractors to detect and deter fraud, abuse, and unnecessary treatments.⁵⁷ Similar techniques can and should be applied to keep banks, search engines, and social networks honest.

More transparency would help outside analysts check "irrational exuberance" in markets and uncover corporate misconduct that is now too easily hidden. It might expose unfair competitive or discriminatory practices. But as I propose regulatory measures, I will repeatedly make the point that transparency is not enough, particularly in the finance sector. When companies parry with complexity too great to monitor or understand, disclosure becomes an empty gesture. We need to put an end to the recursive games of "disclosure" and "tricks to defeat disclosure" that have plagued regulators. Transactions that are too complex to explain to outsiders may well be too complex to be allowed to exist.⁵⁸

The Self-Preventing Prophecy

We need to face the darker possibilities betokened by current trends. There is a venerable fiction genre known as the "self-preventing

prophecy.”⁵⁹ An author imagines a dystopia, plausibly extrapolating to the future some of the worst trends of the present. If enough readers are shaken from their complacency, they start to make the changes that can prevent the prophecy.⁶⁰ The author then avoids the fate of Cassandra, the prophetess of Greek myth whose warnings were fated to be disregarded. George Orwell’s *1984* and Aldous Huxley’s *Brave New World* could both be understood in this way, helping to mobilize resistance to the totalitarian futures they described.⁶¹

Films have also aimed for self-preventing prophecy. In Terry Gilliam’s *Brazil*, things start to go downhill for protagonist Sam Lowry after a fly accidentally jams a printer at an antiterror agency. As he tries to fix the error, a sclerotic bureaucracy closes in around him, wrongly associating him with violent extremists. Gilliam depicted a state run amok, unaccountable and opaque. Its workings are as mindless and catatonic as the citizens whom it tortures into submission.⁶²

We like to believe that we have escaped Gilliam’s 1985 dystopia, just as the plausibility of *1984* was eroded by the Eastern Bloc revolutions of 1989. Most major decisions about our lives are made in the private sector, not by a state bureaucracy. State-of-the-art computers are a far cry from the dusty files of the Stasi or the Rube Goldberg contraptions of Gilliam’s imagining.⁶³ The vibrant leaders of Wall Street and Silicon Valley are far more polished than the bumbling and brutal beadies of *Brazil*. Cornucopians urge citizens to simply get out of their way, and to rest assured that technology will solve problems ranging from traffic jams to freakish weather.

But complacency is unwarranted. Many of these companies make decisions affecting millions of people every day, and small mistakes can cascade into life-changing reclassifications. We cannot access critical features of their decision-making processes. The corporate strategists and governmental authorities of the future will deploy their massive resources to keep their one-way mirrors in place; the advantages conferred upon them by Big Data technologies are too great to give up without a fight. But black boxes are a signal that information imbalances have gone too far. We have come to rely on the titans of reputation, search, and finance to help us make sense of the world; it is time for policymakers to help us make sense of the sensemakers.

In their workplaces and in their homes, Americans are increasingly influenced—some might say bullied—by managers who keep their methods under wraps. Corporations depend on automated judgments that may be wrong, biased, or destructive. The black boxes of reputation, search, and finance endanger all of us. Faulty data, invalid assumptions, and defective models can't be corrected when they are hidden. This book exposes them, and proposes solutions.

3

THE HIDDEN LOGICS OF SEARCH

SEARCH, IN THE VIEW of economic sociologist David Stark, is “the watchword of the information age.”¹ Though most people associate the “search space” with Google, search is a far more general concept. Whether looking for information or entertainment, products or soulmates, we are relying more on dynamic searches than on stable sources. Search pervasively affects our view of the Internet and, increasingly, of “real life.”²

Search engines host billions of queries per day. They “answer” more and more of them without the asker ever having to click through to another site. They keep track of our friends, real and virtual. They find our entertainment. They rank and rate everything for us, from movies to doctors to hotels. Search engines can be general, specialized, or social.³ There are mammoth ones and tiny ones, public ones and encrypted ones, and the array is becoming more varied and more important as content offerings proliferate.⁴

These new masters of media are more than just conveniences. Thanks both to their competence and our inertia, they often determine what possibilities reach our awareness at all.⁵ They are guides; they influence, sometimes quite profoundly, our decisions about what we do and think and buy (and what we don’t). They are revolutionaries; Apple’s and Amazon’s portals have definitively reshaped

commerce.⁶ They are our agents: search for and “friend” a few dozen people on Facebook or follow them on Twitter, and the platforms deliver up a steady stream of content.

Search is a leveler. It lets us, the scrutinized, turn the tables and check out everyone else. It is our entrée to the pool of reputational data to which we all willy-nilly contribute, and at its best it lets us keep tabs on the “digital selves” that so often stand in for us at fateful junctures with bosses, bankers, and other decision makers.

Search gives anyone with a computer or a nearby public library access to resources that were once out of reach of all but the very few with unlimited funds and leisure time. It has the power to give each of us a perfect little world of our own, a world tailored so exquisitely to our individual interests and preferences that it is different from the world as seen by anyone else.

But like everything else in the digital age, search has a dark side, and that dark side has to do with trust. How does a platform decide on the coverage given a third-party mayoral candidate? Or how long to let a meme like Obama’s leaden debate performance or Romney’s 47 percent speech dominate campaign coverage? New media giants can tame information overload by personalizing coverage for us.⁷ But how do those neat and compact presentations of a messy and sprawling world occur? Was a story selected for its statistical prominence among news organs, or because a personalization algorithm picked it out for us? If the selection was based on statistics, then *which* statistics—the number of mentions of the story, the authority of the news outlets promoting it, or something else entirely?

Businesses large and small worry over such matters daily. Hotels appear to be paying more or less stealthily for premium placement on Google’s map and travel services.⁸ How can we know whether news outlets or political campaigns are engaged in subtler manipulations, like routing readers and volunteers to Google+ to increase their salience in Google Search? At least with a dead-tree newspaper we know that everybody looking at it sees the same thing, and there are editors to write to when something doesn’t smell right. But the decisions at the Googleplex are made behind closed doors or, as we’ll see, within black boxes. How far can we trust the people who make them?

The power to include, exclude, and rank is the power to ensure which public impressions become permanent and which remain fleeting.⁹ That is why search services, social and not, are “must-have” properties for advertisers as well as users. As such, they have made very deep inroads indeed into the sphere of cultural, economic, and political influence that was once dominated by broadcast networks, radio stations, and newspapers. But their dominance is so complete, and their technology so complex, that they have escaped pressures for transparency and accountability that kept traditional media answerable to the public.

There’s a lot that we don’t know about these services to which we hand over so much of our lives.¹⁰ Despite their claims of objectivity and neutrality, they are constantly making value-laden, controversial decisions. They help create the world they claim to merely “show” us. I will explore four areas in which the behavior of the great search companies raises pressing issues of trust: transparency, competition, compensation, and control.

Search and Transparency

“Better user experience” is the reason the major Internet companies give for almost everything they do. But surely their interests must conflict with ours sometimes—and then what?¹¹ Disputes over bias and abuse of power have embroiled most of the important Internet platforms, despite the aura of neutrality they cultivate so carefully. It would be reassuring to have clear answers about when conflicts happen and how they’re handled. But the huge companies resist meaningful disclosure, and hide important decisions behind technology, and boilerplate contracts. What happens, happens out of our sight.¹²

Sex and Politics in the Apple Store. Apple remade the world of online music by designing a simple interface, cutting a Gordian knot of copyright conflicts, and providing instant access.¹³ iTunes, iPod, and iPad unleashed a whole new ecosystem of music options and compensation.¹⁴ The power of a well-maintained and popular platform like that is enormous.¹⁵ Common standards let people share, cooperate, and play. As Amar Bhidé, finance expert and professor at

Tufts University's Fletcher School of Law and Diplomacy, has put it, those "innovations that sustain modern prosperity . . . are developed and used through a massively multiplayer, multilevel, and multi-period game."¹⁶

But the rules of Apple's game can be pretty ambiguous. The company's business practices are notoriously secretive—so much so that legal scholars like Jonathan Zittrain and Tim Wu have worried that too much central control might be constraining the creativity of app developers.¹⁷ More to my own point, users have sometimes had occasion to worry that all that invisible control is constraining *us*, as when Apple excludes popular programs from its app store, or prevents them from running on its products. Here are three disconcerting cases.

EUCALYPTUS. In 2012, developers were submitting about 10,000 apps per week to Apple. Quite a lot featured sexual subject matter. Apple's response has been pragmatic and efficient: an antiporn policy that purportedly reflects user demand and deflects spam.¹⁸ The policy also allows Apple to process the flood of new apps efficiently.

But although the "objectionable content" guidelines at Apple are well publicized, the way they are applied is not. Take the veto of an app called Eucalyptus, which was intended for formatting and downloading public domain texts. Apple rejected Eucalyptus on the grounds that it could be used to access "a Victorian-era, text-only version of the *Kama Sutra*."¹⁹ Yet Apple had previously approved apps that do precisely the same thing, and the *Kama Sutra* could be found on Apple's own Safari browser in illustrated (including some truly pornographic) editions. Until *Ars Technica*'s Chris Foresman highlighted this absurdity in a scathing column, Eucalyptus's creator knocked in vain against a "mysterious black box." Press coverage finally spurred Apple into action, and Eucalyptus's fate was reversed by higher-ups.²⁰

In this case, a well-placed story provoked corrective action and a quick apology. But how many apps never attract the attention of journalists? We don't know. There's no census of app developers to poll, and Apple's not telling.

DRONES +. Eucalyptus seems to have been a victim of incompetent or arbitrary decision making.²¹ Other rejections look less benign.

NYU graduate student John Begley developed Drones+ as U.S. drone warfare expanded. It aggregates news stories on drone targets, maps them, and delivers a pop-up notification whenever a new strike is reported. Begley included the real-time alerts to help users keep track of an underreported military initiative.²²

Apple rejected Drones+ twice. The first reason given was that it was “not useful.”²³ (Apple has, however, approved an app that does nothing but display a flame on the screen.) A second rejection letter called the app’s content “objectionable and crude,” a violation of the App Store Review Guidelines. But the content of Begley’s app was news stories, quoted and plotted on a map.²⁴ Apple has approved plenty of apps that describe *and depict* the destruction reported in the news, so that rationale is hard to swallow.²⁵ Despite national publicity criticizing the decision, Apple held firm for two years.²⁶ After five rejections, Begley finally got the app included in the store in 2014 by removing the word “drone” from its name and description, rechristening it Metadata+.²⁷ Whether those interested in tracking drone strikes can find his app without its using the term “drone” is anyone’s guess.

IN A PERMANENT SAVE STATE. Artist Benjamin Poynter submitted his *In a Permanent Save State* as a “persuasive gaming” app, a form of combined entertainment, provocation, and instruction.²⁸ It offered an interactive narrative inspired by the suicides of workers at Apple supplier Foxconn’s plant, which had taken an enormous public relations toll on Apple the year before.²⁹ Poynter intended *Permanent Save State* to highlight the dark contrast between Apple’s dream machines and nightmarish conditions in its supply chain.

Apple did not say why it removed the app shortly after it first appeared. It might have been Guideline 16.1, the catchall ban on “objectionable content,” or 15.3, which forbids depictions of “a real government or corporation, or any other real entity.” Or the topic might have just menaced the company’s famous “reality distortion field.”³⁰ Political speech is especially protected under the First Amendment, but Apple isn’t bound by the Bill of Rights.³¹

Zittrain anticipated opportunistic behavior like this in his 2008 book *The Future of the Internet—And How to Stop It*. His work is a complex and nuanced call for technology companies to reflect public

values in their decisions about what apps to make accessible. Technology scholar Rob Frieden has gone further, challenging the need for app approval at all. When we buy desktop computers we don't have to "phone home" for the manufacturer's permission before we can run a program on it.³² Why does Apple insist on such control? Wouldn't free access to apps work better?³³

In Apple's defense, some control may be necessary to ensure the smooth operation of their phones. Buggy, slow, or spammy apps do hurt its customer base. But Drones+? Since it clearly provides information that people want, why should Apple care? At the very least, it could tell users clearly which apps have been rejected, and why.³⁴

Google as the "Universal" Index. Google is perhaps the most instructive case of how the black box culture developed, and why it matters. Before Google, web navigation for consumers often meant cluttered portals, garish ads, and spam galore. Google took over the field by delivering clear, clean, and relevant results in fractions of a second. Even Silicon Valley skeptics credit Google with bringing order to chaos. For the skilled searcher, Google is a godsend, a dynamic Alexandrian Library of digital content. But commercial success has given the company almost inconceivable power, not least over what we find online.³⁵

Google does not reveal the details of its ranking methods. It has explained their broad outlines, and the process sounds reassuringly straightforward. It rates sites on *relevance* and on *importance*. The more web pages link to a given page, the more authoritative Google deems it. (For those who need to connect to a page but don't want to promote it, Google promises not to count links that include a "rel:nofollow" tag.) The voting is weighted; web pages that are themselves linked to by many other pages have more authority than unconnected ones. This is the core of the patented "PageRank" method behind Google's success.³⁶ PageRank's hybrid of egalitarianism (anyone can link) and elitism (some links count more than others) both reflected and inspired powerful modes of ordering web content.³⁷

It also caused new problems. The more Google revealed about its ranking algorithms, the easier it was to manipulate them.³⁸ Thus

began the endless cat-and-mouse game of “search engine optimization,” and with it the rush to methodological secrecy that makes search the black box business that it is. The original PageRank patent, open for all to see, clandestinely accumulated a thick crust of tweaks and adjustments intended to combat web baddies: the “link farms” (sites that link to other sites only to goose their Google rankings), the “splogs” (spam blogs, which farm links in the more dynamic weblog format); and the “content farms” (which rapidly and clumsily aggregate content based on trending Google searches, so as to appear at the top of search engine result pages, or SERPs). Beneath the façade of sleek interfaces and neatly ordered results, guerrilla war simmers between the search engineers and the spammers.³⁹

The war with legitimate content providers is just as real, if colder. Search engine optimizers parse speeches from Google the way Kremlinologists used to pore over the communiqués of Soviet premiers, looking for ways to improve their showing without provoking the “Google Death Penalty” that de-indexes sites caught gaming the system. And just as wartime gives governments reasons (and excuses) to hide their plans from the public, Google has used the endless battle against spam and manipulation to justify its refusal to account for controversial ranking decisions.⁴⁰

Google is an ambitious company. Its stated goal, as cultural theorist Siva Vaidhyanathan noted in his thoughtful 2010 book *The Googlization of Everything*, is to “organize the world’s information.”⁴¹ But faced with shareholder demands for ever-rising profits, it is also angling for new sources of growth.⁴² It is positioning Google Books and Google Shopping to rival Amazon and eBay as marketplaces. It has made YouTube a critical hub in the entertainment industry. To shake up travel, Google acquired Zagat, the famed restaurant reviewer, and Waze, a leading traffic app.⁴³ As of 2013, it has been acquiring at least a company a month, often in spaces adjacent to its core search business.⁴⁴

Many welcome this expansiveness. Google brings user-friendly design and scale to areas that sorely need them—in its free Gmail and map services, for example. But it also gives cause for concern about what Google’s immensity means, both for us as searchers and for the economy at large.

Google, for instance, has become a double-edged sword as web organizer and archivist.⁴⁵ Yes, its index dwarfs anyone else's. But that is precisely why it can no longer be relied upon as the "indexer of last resort." Virtually any needle can be "disappeared" into a haystack of that size; it is just too easy for the company to hide content it would rather we didn't see. Furthermore, pressing questions have arisen about whether Google is using its dominance in general purpose search to leverage undue power elsewhere. It cloaks its answers in layers of bureaucratic, technical, and contractual obscurity.

We pay no money for Google's services. But *someone* pays for its thousands of engineers, and that someone is advertisers. Nearly all the company's revenue comes from marketers eager to reach the targeted audiences that Google delivers so abundantly. We pay with our attention and with our data, the raw material of marketing. (You are not Google's client, Senator Al Franken once warned users of the World Wide Web. "You are its product."⁴⁶) Sometimes we invest time and effort in a Google service (like arranging blog feeds in Google Reader), only to find the plug pulled abruptly when it isn't profitable enough.⁴⁷ We also pay in our ignorance of how the company operates, how it guides us through the web, and how it uses the data it collects on our activities there.

Secret algorithmic rules for organizing information, and wars against those who would defeat them, exist at Facebook and Twitter, too. Apple and Amazon have their own opaque technologies, leaving users in the dark as to exactly why an app, story, or book is featured at a particular time or in a particular place. The secrecy is understandable as a business strategy, but it devastates our ability to understand the social world Silicon Valley is creating.⁴⁸ Moreover, behind the technical inscrutability, there's plenty of room for opportunistic, exploitative, and just plain careless conduct to hide.

Search, Transparency and Fairness. We trust our search engines to play straight with us: to show us what's there; to put the best suggestions on top so that we don't have to click through thousands of pages to find them; and to rank by relevance unless they tell us otherwise. But do they?

Foundem is a UK-based firm that provides specialized “vertical search” for price comparisons. It is run by a team of husband and wife engineers with formidable CVs and a track record of innovation. Leading consumer and technology organs in the UK ranked Foundem extremely high in comparative studies of its niche.

But Foundem has not been able to convert this critical acclaim into a mass user base, and it blames Google. Less than six months after Foundem launched, Google appeared to block it from the front pages of its *organic* (that is, unpaid) search results when users queried for price comparisons.⁴⁹ The reason, according to Google, was that Foundem was a “low-quality” site, composed mainly of links to other sites. Downranking it could have been a direct result of Google’s algorithmic procedure for protecting users from spammers and link farms.

But sometimes there’s a legitimate reason for a site to sample other sites—in fact, that’s exactly what search engines do, including Google. Google acknowledges this. So, it says, it distinguishes among such sites by downgrading any whose guesses about what a searcher wants are inferior to its own. But, it says, it allows *good* finding tools to make it into the top search results.⁵⁰

Foundem favors another explanation. If Google has no interest in an area, it will let an upstart be. But once it enters (or plans to enter) the market of a smaller finding service, it downranks that service to assure the prominence of its own offerings. (Major incumbents are not displaced lest their users revolt, so they usually retain their access to prime real estate.)

If the smaller engine is a potential acquisition target, Google has another interest in suppressing traffic: to discourage its hope of succeeding independently. Like Pharaoh trying to kill off the baby Moses, it denies its rival the chance to scale.⁵¹ When a would-be purchaser controls significant access to its target’s potential customer base, overtures of interest are offers that can’t be refused.⁵²

The downranking of Foundem drastically reduced its visibility in Google’s unpaid results. When the company tried to reach users with ads, Google cut off that option too. Foundem had been bidding five pence to participate in Google ad auctions, but now Google required a minimum bid of five *pounds*. This made the cost of advertising so

prohibitive that, according to Foundem, for more than a year it was effectively eliminated from the view of those searching Google for price comparison websites.⁵³

In September 2007, Google relented, “whitelisting” Foundem in its *paid* search results, and lifting its penalty. But the exclusion from *organic* search persisted until the tech press began to cover the story. Finally, in December of that year, Google “manually whitelisted” Foundem, assuring its owners that the algorithms that had branded Foundem as useless or spammy web junk would no longer act to penalize (and thus hide) the site.⁵⁴

Google insists that “the system worked” with respect to Foundem; its algorithms for detecting low-quality sites had hurt it for a while, but eventually human intervention addressed the problem.⁵⁵ As Google’s engineers like to say, “Search is hard.” Evaluation and ranking protocols are as potentially controversial in search as they are anywhere else, and when controversies arise, users can’t expect instantaneous resolutions.

But for Foundem and its supporters in the tech press, it’s more sinister than that. Google must meet Wall Street’s expectations and has demanding shareholders. They expect it to grow, and to do so it must expand. It has: with e-mail (Gmail), video (YouTube), social networking (Orkut and Google+), a blog platform (Blogger), and various specialized search technologies such as Image Search and Google News. Now it is venturing into the realms of shopping, travel, advice, reviews, and price comparisons.⁵⁶ Who will Google’s system “work” for next? As Metafilter has found, a rapid decline in Google traffic can be a devastating and mysterious blow to even a well-known, well-respected site.⁵⁷

Google counters that it is under no obligation to help other companies eat into its revenue. Its antitrust lawyers insist that what may look from the outside like self-serving bias is just a consistent commitment to customer service. If engineers know that Google Product Search works, why should they expend time and effort in due diligence on every untested alternative? YouTube has dedicated staff and an active user community that root out spam, porn, and other undesirable material. Is an upstart video service likely to be as well run as Google’s own? The company frames its inexorable ad-

vance from text search into image, video, and who knows what next as a public service. That is one reason American courts have been so forgiving of Google in considering the copyright complaints against it; it has been seen as a benevolent force for order on the web.⁵⁸

(The situation also highlights the limits of economic analysis. If competition law authorities decide to protect specialized services from domination by a general purpose search behemoth, they are effectively delineating a specialized market.⁵⁹ Their decision is not a *reflection* of market forces, but an engine shaping them.⁶⁰ The same can be said of the search engines themselves. Left to their own devices, they create the online marketplace at the same time that they participate in it.⁶¹ There is no neutral ground here: the state either takes steps to protect the upstarts, or allows the giant platforms to swallow them. Like banks that, if allowed to grow too large, can effectively control commerce thanks to their power over its financing, massive internet platforms can similarly dominate because of their power over finding.)

Google's dominance is recognized in Europe, too, but differently. EU antitrust authorities recognize that Google is not really a competitor in numerous markets, but instead serves as a hub and king-maker setting the terms of competition for others. To settle a long-standing antitrust investigation (requested by Foundem, among others), Google as of mid-2013 had offered to guarantee a place on its results page for at least three rival services whenever it offered a service of its own in response to a query.⁶² This is a stark contrast with American antitrust authorities' minimalist approach.⁶³

Was Foundem's exclusion really a side effect of Google's effort to protect searchers from spammy sites? Or was it an attempt to undermine a nascent competitor? The results are susceptible to either interpretation, but Google's "quality scoring" algorithms are so thoroughly black-boxed that we can't know which is correct. More on Google and competition shortly.

Search, Transparency, and "Murketing." "Stealth marketing" is another area of collision between search and trust. Like broadcast networks, search engines survive by offering unpaid content (in this case, *organic* search results) to sell advertising (*paid* search results).⁶⁴

As search engines developed, most of them placed ads at the top and sides of result pages, but used the center for rankings that were free of commercial influence.

American law has long required the separation of editorial and paid content.⁶⁵ At first, Google honored those requirements in spirit as well as in letter. When it was just one of many search engines scrambling for market share, this was not only wise compliance but also good business. Google's transparency about advertising delivered high quality results and gained trust.⁶⁶ Early search leaders who succumbed to the siren song of ad-disguising drove their users away with irrelevant links while Google's audience grew. As more people signed into its system, Google learned more about them and became ever better at tailoring its search results.⁶⁷ Its ad income increased as its targeting improved. This triumph of "Don't Be Evil" is still a celebrated Silicon Valley success story. Patiently gathering data, the company entrenched its privileged position between advertisers, content providers, and audiences.⁶⁸

But in 2012, as it moved from general purpose search into specialized fields like shopping, Google began to back away from strong separation of paid and editorial material.⁶⁹ The Federal Trade Commission strongly encourages search engines to label sponsored content,⁷⁰ and has reserved the right to file suit for unfair and deceptive practices against any search engine that fails to do so. Yet it has never actually filed such a suit. This passivity has emboldened small Internet players, and now Google itself, to weaken some of the visual distinction between paid and unpaid content.⁷¹ Accordingly, it becomes harder to discern whether the inclusion, say, of a given hotel or florist shop in a page of search results reflects its quality or its willingness to pay for visibility.⁷² And the secretiveness of Google's search ranking processes doesn't help. Even Danny Sullivan, a Silicon Valley journalist who has defended Google from many critics, was disappointed in the shift:

For two years in a row now, Google has gone back on major promises it made about search. . . . In the past, Google might have explained such shifts in an attempt to maintain user trust. Now, Google either assumes it has so much user trust that ex-

planations aren't necessary. Or, the lack of accountability might be due to its "fuzzy management" structure where no one seems in charge of the search engine.⁷³

And Google is not alone in arousing watchdogs. Blogs constantly speculate about what it might take to get one of the 500,000 or so apps in Apple's store to stand out. Paid-content issues also dog those seeking attention via Facebook.⁷⁴ Facebook doesn't disclose the "EdgeRank" methods it uses to sort the items in a user's news feed into the stream of links, pictures, and information from friends that makes the site so addictive.⁷⁵ But in 2012, it offered users a chance to pay to promote certain posts. Confusion and resentment ensued almost immediately, as some nonpayers noticed their sudden obscurity and interpreted it as Facebook's way of forcing them to pony up. Without knowing exactly how EdgeRank works, it is very difficult to assess how much substance there might have been in that particular concern.⁷⁶ But anyone with a critical mass of friends can see how unwieldy Facebook's "News Feed" has become: how hard it is, say, to be sure you see all your friends' posts, even when you choose to see "Most Recent" posts rather than "Top Stories." Facebook is increasingly a kingmaker for "digital content providers," but it's entirely unclear how it's choosing which sites to promote and which to doom to obscurity.

This confusion may be to Google or Facebook's advantage, but it is not to ours. Blending paid and editorial content creates a confusing world of "murketing" (murky marketing tactics).⁷⁷ Google founders Sergey Brin and Larry Page admitted in 1998 their expectation that "advertising funded search engines will be inherently biased towards the advertisers and away from the needs of the consumers."⁷⁸

This situation comes up reliably enough in the communications context that there is a long-standing solution: require *both conduits and content providers* to disclose whether they are raising the profile of those who pay them.⁷⁹ Consumers and competitors alike suffer when sub rosa payments are permitted. Money confers an enormous advantage in the battle for mindshare, and fairness requires—at the very least—that when advantage has been bought, it be disclosed.⁸⁰

The question now is whether regulators will adopt and enforce classic rules in a digital age, or let them wither into desuetude.

Search, Transparency, and Judgment. More complex trust issues come up in the ways that the Silicon Valley behemoths handle other disconcerting search surprises.

Google came under fire in 2012, for example, in an awkward situation regarding a prominent German woman, Bettina Wulff.⁸¹ Users who typed her name into the search box were likely to see “bettina wulff prostituierte” and “bettina wulff escort” appear in the “auto-complete” list underneath. Those phrases reflected unfounded rumors about Wulff, who has had to obtain more than thirty cease-and-desist orders in Germany against bloggers and journalists who mischaracterized her past salaciously. Wulff feared that users would interpret the autocompletes (which Google offers as a convenience to users) as a judgment on her character rather than as an artifact of her prolonged and victorious legal battles against slanderers.⁸²

Google’s help pages say that the autocompletes are “algorithmically determined” and usually reflect “the search activity of users and the content of web pages indexed by Google.”⁸³ The company maintained that Bettina Wulff’s wrongful association complaint was none of its business—that it is the obligation of users to appraise the validity of what they read. Yet Google’s own behavior refutes that position. The company is not generally indifferent to what its users think; on the contrary, it is constantly trying to educate us, to discern our intent, to give us “the right answer” in ever more contexts. It even corrects our spelling. Type in “lock ness monster” and we see the results for “*loch* ness monster,” along with a small offer to “Search instead for ‘lock ness monster’” underneath. Google makes at least *some* provisional judgments about what searchers are looking for. Given its interpretive activism about misspellings, one might think that it would lend a hand to a person defamed online, or otherwise dogged by unrepresentative and demeaning material.⁸⁴

Not only autosuggestions, but also search results, can seem inappropriate or unfair. Consider what happened when politician Rick Santorum irked activist Dan Savage. Santorum had compared gay marriage to bestiality, and Savage led an outraged network of blog-

gers in retaliation. They linked so enthusiastically to a site associating *santorum* with anal sex that soon that site was the first result for most Google searches on the candidate's name. The online come-uppance of the ultraconservative candidate delighted many. Santorum supporters complained to Google to no avail. Only after he made a surprisingly strong showing in three GOP primaries in early 2012 did the anal sex association fade from the very top of the search results.⁸⁵

In its public statements about such controversies, Google mostly characterized them as a reflection of the zeitgeist. Its defenders worried that Google would be "opening the floodgates" to political lobbying if it were to override its search algorithms in Santorum's favor. Google itself pointed out its great efficiency and speed are due to its automated search process; to call in human reviewers would likely slow response times. (An outsider might be forgiven for wondering whether it might also depress profit margins.) Above all, Google said, an override would contradict the culture of the company, which was committed to organizing and presenting information based on math, rules, and facts, not on opinion, values, or judgment.⁸⁶

But Google has surrendered its "objectivity" position from time to time.⁸⁷ In 2004, anti-Semites boosted a Holocaust-denial site called "Jewwatch" into the top ten results for the query "Jew."⁸⁸ (Ironically, some of those horrified by the site may have helped by linking to it in order to criticize it; PageRank by and large looks only to linking itself, and not the reasons behind it, to determine a site's prominence.)⁸⁹ The Anti-Defamation League complained. Google added a headline at the top of the page entitled "An explanation of our search results."⁹⁰ A web page linked to the headline explained why the offensive site appeared so high in the relevant rankings, thereby distancing Google from the results.⁹¹ It might want to consider doing the same at YouTube, where (according to a noted author) watching a few videos of old speeches on the Federal Reserve can quickly provoke a rabbit hole of anti-Semitic "suggested videos" on financial conspiracy theories.

There are principled grounds for a large Internet firm like Google to leave the Santorum results alone, while aggressively intervening

to stop the spread of virulent discrimination. But we need to know more about how such decisions are made, given the power of large Internet firms, and the much harder issues on the horizon. A psychologist has conducted experiments suggesting that a “dominant search engine could alter perceptions of candidates in close elections.”⁹² Jonathan Zittrain spells out how known technology at a dominant social network could have an even more insidious effect:

Consider a hypothetical, hotly contested future election. Suppose that Mark Zuckerberg personally favors whichever candidate you don’t like. He arranges for a voting prompt to appear within the newsfeeds of tens of millions of active Facebook users. . . . Zuckerberg makes use of the fact that Facebook “likes” can predict political views and party affiliation, even beyond the many users who proudly advertise those affiliations directly. With that knowledge, our hypothetical Zuck chooses not to spice the feeds of users unsympathetic to his views.⁹³

When Facebook tried the “vote prompt” in 2010, 0.39 percent more users notified by it voted—well more than enough to swing the outcome in contests like the 2000 U.S. presidential election. Note that Facebook is neither obliged by current law, nor by its terms of service, to announce such interventions.

Are tech titans’ political preferences skewed enough to make such a plot tempting? Many Republicans have complained that Google⁹⁴ skews search results to mock or marginalize the right;⁹⁵ columnist Michelle Malkin charged that websites like hers weren’t appearing in Google News results.⁹⁶ Later, after George W. Bush and Barack Obama were both subjected to “google bombs”⁹⁷ that linked their names to the words “miserable failure,” Fox News reported conservative discontent that the manipulation involving Obama was resolved quickly, but it took Google almost four years to address the issue with respect to Bush.⁹⁸ Certainly its responses in these varied cases don’t present a picture of a clear policy.

Moreover, Google *did* defuse the Bush and Obama g-bombs, although at different speeds. Why did they rate an override and Santorum didn’t? Did the company learn enough from the response to

the Bush prank to somehow respond faster when it was Obama's turn?⁹⁹ Did the difference reflect more years of practical experience? A new policy? Political views? We don't know. It's an odd thing to trust a search engine so much when we have no way of ascertaining whether or not it acts on a political agenda, or to what extent it will allow clear manipulation to go unchallenged.

Limited "rights of reply" would constitute one way of adding information to a digital platform; annotations could be permitted in certain instances of express or implied defamation, for example.¹⁰⁰ Google continues to maintain that it doesn't want human judgment blurring the autonomy of its algorithms. But even spelling suggestions depend on human judgment, and in fact Google developed that feature not only by means of algorithms, but also through a painstaking, iterative interplay between computer science experts and human beta testers who report on their satisfaction with various results configurations.¹⁰¹ It's true that the policy for alternative spellings can be applied generally and automatically once the testing is over, while every situation like Wulff's or Santorum's would require a fresh independent judgment. Perhaps Google fears that reputational micromanagers would overwhelm it with requests. But would it really be so hard for the search engine to turn off autocomple-
te when it's causing unnecessary harm?

Google's repeated refusals even to entertain such reform proposals suggest that the companies' executives believe they've found one best way of ordering the web, outside input be damned. That is an ironic stance for a company that once accused critics (in the context of an FTC antitrust investigation) of a naïve, outdated, and overly rigid conception of search results as "ten blue links."¹⁰² Google argued successfully at that time that certain prerogatives of malleability were due a company that has to make rapid and dramatic changes in its "product." Don't those prerogatives come with responsibilities, too?¹⁰³

Unfortunately, technology firms tend to resist accountability. Consider how America's leading microblogging platform, Twitter, deflected concerns about its algorithms. Twitter hosts whatever short bursts of content (*tweets*) its users contribute. Their message varies widely: from the banal (@KimKardashian) to the

profound (@SorenKQuotes), from networking to gibberish to satire (@KimKierkegaard). It can function as either a broadcaster or a narrowcaster, according to the predilections of individual users. It has also become a crowd-sourced democratic search engine for news and conversation. By putting a hashtag (#) in front of a term, users form an automatic “real-time” community around it; anyone who clicks on the term will see items tweeted about it in the past few seconds, hours, or days.¹⁰⁴

The hashtag also serves to nominate some terms as “trending”—that is, interesting enough to be recommended *generally* rather than simply to the *followers* who subscribe to one’s own tweets.¹⁰⁵ Trending topics are listed on Twitter’s Home, Discover, and Search pages. Users tend to understand them as hot, fun, or particularly interesting news, and activists use the Trending Topics lists to assess their success in engaging a mass audience.¹⁰⁶

In late September of 2011, Occupy Wall Street was starting to gain media attention. But although #OWS and #occupy seemed to be collecting more tweets than other terms on the official Trending Topics list, Twitter didn’t show them there. Organizers and sympathizers began to accuse Twitter of overriding its trending topics algorithm to suppress those terms, and therefore of censoring their politically controversial movement.¹⁰⁷ @TheNewDeal (@ identifies a Twitter username) put it bluntly on October 1: “It is Official, @ witter is Censoring #OccupyWallStreet There is No Way in Hell That it is Not the #1 Trending Topic in America.”¹⁰⁸

The response from the company was swift: no censorship was occurring. Sean Garrett, head of communications at Twitter, replied to @TheNewDeal that “Twitter is not blocking #OccupyWallStreet from trending. Trends are based on velocity not popularity.” Twitter also pointed to a similar situation in 2010, when people had been complaining that #wikileaks did not appear prominently enough in Trending Topics. At that time, the company explained:

Twitter Trends are automatically generated by an algorithm that . . . captures the hottest emerging topics, not just what’s most popular. Put another way, Twitter favors novelty over popularity. . . .

Topics break into the Trends list when the volume of Tweets about that topic at a given moment dramatically increases. . . . Sometimes, popular terms don't make the Trends list because the velocity of conversation isn't increasing quickly enough, relative to the baseline level of conversation happening on an average day; this is what happened with #wikileaks this week.¹⁰⁹

The #wikileaks and #occupy controversies died down quickly after Twitter offered these explanations. But when a site called Thunderclap attempted to hold a trending topic in reserve until it could unleash its followers all at once, timing all their tweets for maximum impact, Twitter suspended Thunderclap's access to its API.¹¹⁰

Media studies scholar Tarleton Gillespie analyzed the company's position in a widely shared blog post titled "Can an Algorithm Be Wrong?" He observed that "as more and more of our online public discourse takes place on a select set of private content platforms and communication networks, and these providers turn to complex algorithms to manage, curate, and organize these massive collections, there is an important tension emerging between what we expect these algorithms to be, and what they in fact are."¹¹¹ For Gillespie, the problem is less one of fair platform practices than of media literacy. People were misunderstanding Trending Topics.¹¹²

But at what point does a platform have to start taking responsibility for what its algorithms do, and how their results are used? These new technologies affect not only how we are understood, but also how we understand. Shouldn't we know when they're working for us, against us, or for unseen interests with undisclosed motives?

Dizzying shifts in the ways Internet platforms characterize themselves amount to a form of regulatory arbitrage, evading the spirit of classic legal obligations.¹¹³ When faced with copyright and defamation lawsuits, they claim not to be media companies (that is, producers of content), but only conduits (that is, pipelines for content).¹¹⁴ A conduit does not enjoy the most robust First Amendment protection, but it gains freedom from liability in cases of defamation.¹¹⁵ (For example, the phone company can't refuse to serve me on First Amendment grounds, but it also can't be sued by someone I defame using the phone.) Thus Google can argue that the very idea of suing

it for its autocompletes is as nonsensical as a lawsuit against the phone company for enabling a slanderer to spread lies over its network.

But in other cases, Google has also maintained that its services *are* content and that it *is* entitled to the media's fullest First Amendment protections, which include not only the right to free expression but also the right not to be forced to express opinions not its own.¹¹⁶ Expansive interpretations of the First Amendment could leave Google nearly unregulable. Fortunately, there is also plenty of legal doctrine suggesting the limits of opportunistic civil libertarianism.¹¹⁷

Search, Transparency, and Personalization. The secret workings of our search engines deeply inform our views of the world. That truth comes as a real shock to many of us. I don't know how often I've heard someone say, "I'm the top Google result for my name!" But if *I* searched for your name, would I see the same thing? Only Google knows, but very likely not. We can only guess at how our Google-mediated worlds differ.

We know that what we do while signed into Google services (like Gmail) will be reflected in our search results. This has been true for a long time. As far back as 2007, Google was investing heavily in customization technology.¹¹⁸ By late 2009, it had changed its algorithms to deliver "personalized search" to all web users. Our locations, our search histories, our computers—all of these and more influence Google Search results, and therefore our view of the world.¹¹⁹

The basic outlines of similar processes are clearer on Facebook and Twitter, where users curate continuously scrolling feeds. But even there, judgments have to be made about what to do with, say, a sudden burst of content from one source, or the flagging of potentially "objectionable" content.

Personalization lets us hide annoying relatives on our Facebook feeds, list our favorite microbloggers, and get updates from crucial RSS feeds. It means that Google News might give pride of place to baseball, music, or left-wing politics according to the reputations we establish. It means that Google Search orders its results according to searches we've made before, through clicks collected by the

Google-owned ad network DoubleClick and through activity on other Google-related accounts.

Personalization makes for digital magic. Let's say that you've lost a favorite earring and want to replace it. And that when you first found the pair many years ago, you took a picture of it and sent it in an e-mail to your sister. When you next search Google Images for earrings, you may find an exact match at the very top. You wouldn't know that the critical data point was the picture in your e-mail; you don't even have to remember that there ever *was* a picture or an e-mail at all. This is just what happens when you've got a search engine (as aggressive about data aggregation as Google) attached to your own e-mail account. Multiply that experience by years of people, e-mail, and search—that's how powerful the dominant platforms really are as artificial intelligence aids for virtually any tasks we undertake.¹²⁰ They have unmatched abilities to advance users' data-dependent interests.

But personalization has unnerving effects, too. Google results have become so very particular that it is increasingly difficult to assess how much of any given subject or controversy any of us actually sees. We see what we have trained Google to show us and what Google gradually conditions us to expect. Entrepreneur Eli Pariser calls this phenomenon "the filter bubble" and worries that all this personalization has serious side effects, namely increased insularity and reinforced prejudice.¹²¹ So intense is the personalization of search results, for instance, that when British Petroleum's (BP) massive oil spill was dominating cable news in the summer of 2010, searches for "BP" on Google led some users to fierce denunciations of the company's environmental track record, and others to investment opportunities in the company.¹²² Only the search engineers at the Googleplex can reliably track who's seeing what and why. And they are bound by nondisclosure agreements not to tell us.¹²³

Personalization means vulnerability as well as power. If a social network knows you love poker, it can prioritize posts about casinos. But it might also get you included on a "sucker's list" of problem gamblers for casino advertisers.¹²⁴ The same platforms on which Arab Spring protesters virtually assembled to overthrow corrupt

rulers also generate intelligence for autocrats.¹²⁵ Data deployed to serve users one moment can be repurposed to disadvantage them the next. In contemporary American policy debates, these concerns are often framed as privacy issues. But they are equally concerns about search. Who are the men behind the curtain, and how are their black boxes sorting and reporting our world?

Shaping it, too. Personalization is critical to both buying and selling, and that is why reputation and search go hand in hand in the digital economy. How we are seen by websites in turn affects the choices they present to us. Businesses want to know how we search precisely so they can shape our view of the marketplace. We shape the marketplace too, in our search for the best prices and the widest choice. Accurately attuned search results attract users, and accurately targeted users attract advertisers. The most lucrative ads are those “narrowcast” on search result pages, because they reach niche audiences who have already volunteered information about what they want.¹²⁶ A florist is likely to pay more to advertise to people searching for “roses” than to any random group of computer users.¹²⁷ But it’s better still when Google can tell it not only how often its searchers query “roses,” but also the sites they go to in response. And what goes for Google is increasingly true of Facebook, Twitter, and so on.

As usual, there’s danger here. The advantages of this sort of pin-pointing are leading advertisers to abandon traditional, and even not-so-traditional, publishers in favor of the huge Internet platforms. Why? Because nobody else can approach either the granularity or the comprehensiveness of their data. The result is a revolution-in-process about who can afford to keep publishing, and concomitant alarm about the concentration of media clout into fewer and fewer hands.

Search, Trust, and Competition

Neoclassical economists envision a direct and positive relationship on the Internet between privacy and competition. If a large online company is abusing its position, market-oriented scholars say, economic forces will solve the problem.¹²⁸ Can’t find something on Google? There’s always Bing. Don’t like the new version of iTunes?

Subscribe to Rhapsody. Google not private enough? Try Duck-Duck-Go.¹²⁹ Users can select for a preferred level of privacy the way car buyers select for miles per gallon.¹³⁰ And if they choose services that *don't* provide privacy protection? Well, that just reveals the place of privacy in their priorities.¹³¹

It would be great if market forces really were directly promoting optimal levels of privacy. It would also be splendid if antitrust law were promoting them indirectly, by assuring that a diverse range of firms could compete to offer them.¹³² But the plausibility of these desiderata is fading. Competitive striving can do as much to trample privacy as to protect it.¹³³ In an era where Big Data is the key to maximizing profit, *every* business has an incentive to be nosy.¹³⁴ What the search industry blandly calls “competition” for users and “consent” to data collection looks increasingly like monopoly and coercion.

Silicon Valley is no longer a wide-open realm of opportunity. The start-ups of today may be able to sell their bright ideas to the existing web giants. They may get rich doing so. But they're not likely to become web giants themselves. Silicon Valley promulgates a myth of constant “disruption”; it presents itself as a seething cauldron of creative chaos that leaves even the top-seeded players always at risk. But the truth of the great Internet firms is closer to the oligopolistic dominance of AT&T, Verizon, and Comcast.

In 2008, I testified before a congressional committee about Google's market power. Just about every representative who questioned me assumed that a clique of twenty-somethings could at that very moment be developing an alternative. They didn't know much about the Internet, but they knew that Larry Page and Sergey Brin had risen from grad students to billionaires by building a corporate colossus out of old servers and ingenuity. In their imaginations, Google's own rags-to-riches story foreshadowed its eventual displacement.¹³⁵ Even law professors who ought to know better buy into this myth. “No one's even going to care about Google in five years!” one heatedly told me. That was six years ago. Too many still believe that the digital economy is by its nature open, competitive, and subject to the disruption that it preaches for other fields.¹³⁶

But how realistic is this? The electricity consumption of Google's data centers rivals that of Salt Lake City.¹³⁷ Technology historian and journalist Randall Stross estimated in 2008 that the company uses close to a million computers to index and map the web.¹³⁸ If he is within even an order of magnitude of the real number (a strictly protected trade secret), it's pretty hard to imagine how an alternative could be brewing in somebody's garage. Even with millions in venture capital funding, even with computing space leased from Amazon, a start-up with valuable new search technology is far, far more likely to be bought up by Google than to displace it.¹³⁹

Well, then, maybe another giant could take Google on? So far Microsoft is losing \$2.6 billion a year on Bing.¹⁴⁰ The government? They tried that in Europe, but the Quaero project sputtered out, perhaps because the \$450 million or so allocated to it could not compete with Google's \$100 billion in annual revenue. Anyway, it's a virtual certainty that any other Goliath that could seriously squeeze Google has its own secretive and restrictive black box carapace.¹⁴¹

It's not only prohibitive infrastructure costs that keep competitors from emerging in the general search space. Innovation in search depends on access to a user base that "trains" algorithms to be more responsive.¹⁴² But the user base belongs to Google. Innovation in analysis depends on access to large quantities of data. But the data belongs to Google. And Google isn't sharing. As long as Google's search data store remains secret, outside innovation is dead in the water. Robert Merton called this the "Matthew Effect": to those who have much, more is given.¹⁴³

Furthermore, what if someone *did* manage to come up with a terrific alternative? They'd often have to market it through the very channels they wish to displace. If Google, Apple, Amazon, and Facebook really don't want most of their users to see something—a competitor, an alternative, whatever—they are well able to make sure it won't be seen.

Restrictive terms of service are another deterrent.¹⁴⁴ Every user who types in a search query agrees not to copy, modify, distribute, sell, or lease any Google service for *any* reason, or attempt to reverse engineer one.¹⁴⁵ Advertisers have faced other restrictions.¹⁴⁶

Finally, there's the black box itself. Google's secrecy not only keeps spammers from manipulating its results but also keeps rivals from building upon its methods or even learning from them. Unlike patented procedures, which must be disclosed and whose protection eventually expires, trade secrets need never be revealed, let alone released into the public domain of free reuse.

All of these factors undermine robust competition. Silicon Valley rushes to monetize and control access to information that would better be anonymized and licensed openly as the raw material of future innovation. Quantum leaps in technology sufficient to overcome such disadvantages are unlikely. Search now is as much about personalized service as it is about principles of information organization and retrieval.¹⁴⁷ Many more people use search now than when Google conquered the field in the early 2000s, and they are mostly Google's. So its current advantage is likely to be self-reinforcing.¹⁴⁸ There have been isolated consumer boycotts, but a company so dominant can do without the business of, say, hardcore Santorum supporters. Serious complaints lodged against the company are seldom loud enough to be noticed by ordinary searchers, let alone to provoke sympathy. Users lack both the ability and the incentive to detect manipulation as long as they are getting "good enough" results.

So we're stuck. And again the question arises: With whom? The exciting and radical Internet platforms that used to feel like playmates are looking more like the airlines and cable companies that we love to hate. "Don't Be Evil" is a thing of the past; you can't form a trusting relationship with a black box. Google argues that its vast database of information and queries reveals user intentions and thus makes its search services demonstrably better than those of its whippersnapper rivals. But in doing so, it neutralizes the magic charm it has used for years to fend off regulators. "Competition is one click away," chant the Silicon Valley antitrust lawyers when someone calls out a behemoth firm for unfair or misleading business practices.¹⁴⁹ It's not so. Alternatives are demonstrably worse, and likely to remain so as long as the dominant firms' self-reinforcing data advantage grows.

Search and Compensation

At the 2013 Governing Algorithms conference at New York University, a data scientist gave a dazzling presentation of how her company maximized ad revenue for its clients. She mapped out information exchanges among networks, advertisers, publishers, and the other stars of the Internet universe, emphasizing how computers are taught by skilled programmers like herself to find unexpected correlations in click-through activity. To some extent the algorithms were machines that would go of themselves, freed from supervision. “That gives me more time to ride my horses,” she joked.¹⁵⁰

Intrigued by the idea of machines learning, one listener asked, “At what point do the algorithms do *your* job?” In other words, when does the computing process itself reach the third level of sophistication and start determining for itself which metrics are the best metrics for measuring past metrics, and recommending further iterations for testing?¹⁵¹ The presenter brushed off the question. *She* remains indispensable, even as machine learning methods are said to render millions of other jobs obsolete.¹⁵²

Maybe she’s right. But to know, we’d need expert access to the interactions between humans and machines in her firm, and we don’t have it. So some of us will keep wondering about the extraordinary returns that top CEOs, managers, and investors are deriving from the Big Data economy. Compensation, like competition, raises major legal and moral issues. The first step in approaching them is awareness, especially since the black box aspect of Internet infrastructure has been so notably successful in keeping its economic arrangements out of the public eye.¹⁵³

There are two intertwined issues here. One has to do with concern about appropriate levels of compensation for executives, intermediaries, and investors. These questions do not apply uniquely to search firms; on the contrary, they are very common in other fields. They were central, for instance, in the struggle over the Affordable Care Act, which aimed to keep insurance premiums from being siphoned disproportionately out of health care proper and into insurer profits and CEO compensation. They will come up acutely in the next chapter, on Wall Street. They haunt other corners of the

information world—for instance, the cable and telephone companies that benefit along with Silicon Valley firms from the massive increase in traffic engendered by the world of search. These companies have also been accused of capturing an unfair share of revenues. These are not new questions, but it's time to ask them in our new context.

The second issue has to do with appropriate recompense not for search firms and their investors, but for the innumerable contributors to the Internet who make search worthwhile. I will start with the second, and then circle back to the first.

If there were nothing on the net, no one would be looking for it. In their book *Unjust Deserts*, Lew Daly and Gar Alperovitz document the centuries of past endeavor on which today's technical progress rests. The top dogs of Webs 2.0 and 3.0 are enriched as surely by the millions of searchers who improve their services and attract their advertisers as they are by their own ingenuity. They are further enriched by the army of creative people without whom the web would be contentless. And they are enriched by all the old technologies that contribute to new ones. Without the communication and computing of the nineteenth and twentieth centuries, for example, search would not exist at all. Yet the revenue generated online goes more and more to the masters of search infrastructure, and less and less to support the culture that makes the infrastructure possible and meaningful.¹⁵⁴

The retail dominance of Walmart offers a cautionary tale here. Walmart grew to be the largest retailer in the United States by attracting consumers and squeezing suppliers. As its customer base expanded, it forced its suppliers to accept ever smaller margins. Consumers had little loyalty to the sources of their shampoo, socks, and dog food; they were pleased to accept Walmart as the place to find ultracheap everything.¹⁵⁵

Firms like Google and Apple are the Walmarts of the information economy.¹⁵⁶ They aggressively scheme to restrict their own workers' wages.¹⁵⁷ They squeeze content producers (for whom making it on a big platform may mean everything), and habituate users to value the finding service itself over the sources of the things found. The content contributors—the writers, musicians, filmmakers, artists,

historians, scholars, photographers, programmers, journalists, activists, cooks, sailors, manufacturers, yoga teachers, knitting gurus, auto mechanics, dog trainers, financial advisers, Lego architects, and muckrakers in quest of whose output people use major internet platforms—may receive no share at all of the revenues that that vast user base occasions. The ones that do are often obliged under contract not to reveal what their share is.¹⁵⁸ That is an ingenious way for the platform to cripple any opportunity for them to unite to organize for better terms.¹⁵⁹

Even some progressive voices trivialize the value of ordinary Internet users' work and play. When one gadfly called Google out as a parasite extracting value created by others, law professor and digital rights activist Lawrence Lessig answered: "In the same sense you could say that all of the value in the *Mona Lisa* comes from the paint, that Leonardo da Vinci was just a 'parasite' upon the hard work of the paint makers. That statement is true in the sense that but for the paint, there would be no *Mona Lisa*. But it is false if it suggests that da Vinci wasn't responsible for the great value the *Mona Lisa* is."¹⁶⁰

This is a provocative but very puzzling metaphor. Is Lessig really implying that Google's organization of the web by query does for it what da Vinci did for some pots of paint? That it is not the content, but the *index*, that gives the web meaning? After all, the new economy preaches that "information" is just another commodity. From Google's perspective, content, data, and information are basically 1's and 0's and the ad payouts they generate. But to most of us, the value of a website lies in its meaning, not its salience. And real careers, real incomes, and real achievements are won and lost in the struggle for salience that platforms host daily.

This brings us back to our equestrienne presenter, to the lords of the cloud, and to the question that is really the theme of this chapter. Who are these people and these companies that wield so much power in our lives? What do we owe them? Are they really the Gandalfs of the digital world, wizards selflessly guiding us through digital brambles? Or is it time to reconsider some conventional views about technology, labor, and value in the information economy?¹⁶¹

Silicon Valley's top managers are well educated and technically skilled, but they are not great sages. They hide behind corporate

operations so covert that their actual contributions are hard to assess, and it's hard not to wonder whether other firms or other individuals might make more constructive use of their data than they do. If not, why all the secrecy? Certainly they are beneficiaries of what is for them a wonderfully virtuous cycle. Thanks to the ingenuity and luck of company founders, they have acquired an audience. This allows them to offer data-driven targeting to advertisers, with whose handsome payments they can buy content, apps, and other enticements (the fruits of *other* people's ingenuity) that draw a bigger audience still, and so on. The well-realized technological vision that attracts the initial user base deserves recompense. But it does not entitle present corporate leaders to endlessly leverage past success into future dominance. What Thomas Piketty said of unlimited capital accumulation applies as well to untrammelled tech giants: "the past devours the future."¹⁶²

The data advantage of the Silicon Valley giants may owe as much to fortuitous timing as to anything inherent in the firms themselves. Social theorist David Grewal has explained the "network power" of English as a lingua franca; it's not "better" than other languages; it's not easier to learn, or any more expressive. It just happened to be the language of an imperial power during an important period of globalization, and that of the world's dominant economic power from 1945 on. So it serves well now as a common standard for the communications of far flung elites. To have been prominent at a critical point in Internet development was a similar piece of luck. Google or Facebook were once in the right place at the right time. It's not clear whether they are still better than anyone else at online data science, or whether their prominence is such that they've become the permanent "default."

We also have to ask whether data *science* is still key here, or just the data itself. When intermediaries like Google and Facebook leverage their enormous databases of personalized information to target advertising, how much value do they add in the process? This is a matter of some dispute. Every so often we see an old-style advertising genius come up with a brilliant angle for introducing a new product to an unfamiliar audience. But that's not what Google and Facebook do. The frenzy of ad-matching described in books like

Joseph Turow's *The Daily You* is not a triumph of creative ingenuity.¹⁶³ Much depends on a store of personal and demographic information: who has the best list of single white women between 25 and 35; or wealthy, exurban gun-owning households. The matching game may simply rest on a catalog of crude correlations: who has the biggest set of past data on what X group of people (say, fathers under 30) does when Y appears (say, a Mother's Day ad for flowers). Some algorithmic expertise may be needed to infer telling characteristics from the websurfing habits of a particular IP address. But in some ways, the new media giants, for all their glamour, are glorified phone books, connecting message senders with message receivers. They just present businesses with a yellow pages of *people*, organized into audiences.

For all these reasons, it's time to recast the black box search culture as an occasion for skepticism, not for deference, adulation, or more fawning tech press profiles. But even though a more realistic assessment of the relative contributions of the search giants and the content makers, and the diversion of a fairer share of intermediary revenues to the latter, are necessary first steps toward a better online landscape, they are only first steps. There are other reasons to beware the concentration of so much power and money into so few hands, and they are not all economic.¹⁶⁴ They include the importance of media diversity, of independent gatekeepers, and of "distribution of communicative power and opportunities among private actors."¹⁶⁵ A series of laws passed over the course of the twentieth century ensures some basic ground rules for the communications infrastructure, but the new information environment raises new challenges at every turn.

Consider Google's breathtaking aspiration to scan millions of books, many still under copyright, into a searchable index of unprecedented proportions. Google Book Search has provoked storms of public controversy and private litigation.¹⁶⁶ The plan raises countless questions about fair compensation and transparent organization. The most highly publicized aspect of the debate centers on the rival property rights of Google and the owners of the copyrights of the books it wishes to scan and index.¹⁶⁷ But there are others just as important.

Journalistic narratives largely portray the Book Search project as an unalloyed advance in public access to knowledge, and Google has indeed established alliances with some of the leading libraries of the world. Its 2013 fair use victory also paves the way (in principle) for rival book search engines to arise. But here, again, competition may be illusory: it's hard to see the rationale (or investor or public enthusiasm) for subjecting millions of volumes (many of them delicate) to another round of scanning. Once again, Google reigns by default. The question now is whether its dictatorship will be benign.

Does Google intend Book Search to promote widespread public access, or is it envisioning finely tiered access to content, granted (and withheld) in opaque ways?¹⁶⁸ Will Google grant open access to search results on its platform, so experts in library science and information retrieval can understand (and critique) its orderings of results?¹⁶⁹ Finally, where will the profits go from this immense co-operative project? Will they be distributed fairly among contributors, or will this be another instance in which the aggregator of content captures an unfair share of revenues from well-established dynamics of content digitization? If the Internet is to prosper, *all* who provide content—its critical source of value—must share in the riches now enjoyed mainly by the megafirms that organize it.¹⁷⁰ And to the extent that Google, Amazon, or any other major search engine limits access to an index of books, its archiving projects are suspect, whatever public-spirited slogans it may adduce in defense of them.¹⁷¹

Philosopher Iris Murdoch once said, “Man is a creature who makes pictures of himself and then comes to resemble the picture. This is the process which moral philosophy must attempt to describe and analyse.”¹⁷² The large Internet firms make pictures of us and our world and enforce the resemblances between them. But they downplay the moral implications of their work, and the legal ones, too. In the next section, I will look back to earlier times when robust regulation was still being brought to bear on these processes.

Search and Control

What if one of the big electric companies bought out Whirlpool and thereafter doubled its electricity rates for anyone using a different brand of refrigerator or washing machine?¹⁷³ I imagine there would be mass protest and a slew of lawsuits. The very possibility seems antique, the fever dream of a robber baron. But in the digital realm, monopolistic cable firms are angling to impose a similar arrangement: to make Internet access cheap if paired with their own content, and pricier if used to access others' work. Similarly, firms like Google and Amazon are in prime position to make money off both sides of a two-sided market: monetizing our data and purchases, while promoting to us their own products and services, or those of "partners" who let the larger platform share in their profits.

That's one reason we need to look back to the legal principles that animated Populists and Progressives in response to America's first Gilded Age. The great Internet companies and the physical networks that enable them are not the first private enterprises to achieve near monopolistic power over a key service, and to leverage that power into windfall profits and influence.¹⁷⁴ It happened in the nineteenth century with railroads and telegraphs.¹⁷⁵ Like today's search and cable companies, those firms controlled essential junctions of an emerging economic order. They were private businesses, but they controlled vital resources and enjoyed a power similar to that of a public authority.

Social, political, and legal conflicts arose around the exercise of this power, and demands to restrain it mounted. The most common and important grievances against these companies had to do with "discrimination," meaning both inequitable and unequal treatment of individuals, and complete refusals to serve.¹⁷⁶

Litigants turned first to the ancient section of the common law that governed bridges, innkeepers, and other common carriers, and developed it into a comprehensive framework for governing the new entities that corporate industrialism had produced.¹⁷⁷ In a second stage, when court-based supervision alone proved insufficient, a statutory and administrative framework for regulation was gradually created. This became the foundation of the modern regulatory

system, which over generations has established well-tested guidelines about how essential utilities can use their power.¹⁷⁸

The telephone company, for instance, cannot oblige a business to pay rising shares of its revenue for service lest it be cut off. Telephone rates (or “tariffs”) have to be publicly posted, and are often regulated. Utility firms may not discriminate: universal service rules keep carriers from connecting only to lucrative urban areas and ignoring others. This complex regulatory history profoundly shaped the U.S. communication landscape. The requirement that tariffs be fair and nondiscriminatory balanced the carriers’ drive for profit against customers’ need to be protected against exclusion or exploitation by a “must-have” service.¹⁷⁹ The requirement that networks include everyone established a level playing field among the different regions of the United States. And there are strict limits on the degree to which these essential companies can use their privileged access to communications for their own commercial advantage.¹⁸⁰

Every time a new kind of infrastructure becomes critical to everyday life, regulators are challenged to strike the fairest balance they can between public and private good. It’s time to situate the giants of Internet search and networking in this tradition. Time-honored principles underlie the regulatory framework of our other utilities.

Admittedly, these are complex issues. Even if we had a Federal Search Commission, we couldn’t just transfer the current Federal Communications Commission Rules over to it.¹⁸¹ A well-established rubric of accountability like the one for carriers does not yet exist for search technology. But the carriers’ rules did not spring forth, fully formed, like Athena from the head of Zeus. They were crafted over decades, and we should commit ourselves to a similar project in the world of search.

One of the most enduring principles of communications regulation has been transparency. That’s needed now more than ever. In the instantaneous and fluid world of apps and search engines, it’s much harder to tell what actually goes on behind the scenes. Discrimination used to be as simple as flipping a switch and denying access to a network; everybody knew it was happening, and when, and where. But an ISP or search engine can slow down transmission speed or reduce a website’s ranking in nearly undetectable ways.¹⁸² Moreover,

there are many points of control for both desktop and mobile Internet users.¹⁸³ Even when something suspicious is happening, it's easy for one player to shift responsibility to others.

Many communications mavens are ready to throw up their hands at the complexity, and hope that market pressures and bad press will deter bad behavior. But as we have seen, Big Data giants entrench their dominance over time.¹⁸⁴ They gain power in Washington and state capitals, too, and may well influence regulation in self-serving ways. It does not follow, however, that doing nothing is the preferable option. We need to revive regulation, not give up on it. Internet service providers and major platforms alike will be a major part of our informational environment for the foreseeable future. The normative concerns associated with their unique position of power are here to stay. A properly designed regulatory approach may do much to clarify and contain the situation; without one, will deteriorate.

Content, Conduits, and Search: The Emerging Co-opetition

Once upon a time, we could imagine that scrappy Internet firms—Google among them—were doing battle on behalf of their users against old-line oligopolists like the record labels and cable companies. Silicon Valley firms fought for net neutrality and opened up troves of content. Business analysts hoped Google might even expand into “dark fiber” nationwide, to shake up the moribund Internet service market. But as Google has consolidated its own power, it is now more inclined to make common cause with these older giants than to resist them.¹⁸⁵ The implications are sobering. Competition is muted; cooperation accelerates; and the hoped-for dynamism of Internet economics is congealing into a static combination of the two, “co-opetition.”¹⁸⁶

Strange Bedfellows. The lifecycle of YouTube is a relatively straightforward example. Founded by a pair of young entrepreneurs, it grew explosively in the mid-2000s as a cornucopia of unauthorized videos: old films that had been MIA for decades; obscure gems of musical performance; early animations; political speeches. (Cats, too.)

Users uploaded millions of hours of their own content, and community members helped each other organize the material, developing a tagging “folksonomy” so clever that searchers could find even the most obscure content.¹⁸⁷

The sale of YouTube to Google for over a billion dollars in 2006 was cheered as another of the great tech success stories. But YouTube was not universally adored. To many leading copyrightholders, it was an unrepentant enabler of infringement.

The Digital Millennium Copyright Act (DMCA) of 1998, while increasing the penalties for copyright infringement on the Internet, had immunized some providers of online services from direct responsibility for the content posted by their users. YouTube thus maintained that it was as innocent of infringement as, say, the phone company would be if one of its customers played a copyrighted recording over its lines. But the DMCA also suggested that a video search engine did have some responsibility for screening out pirated content. For example, an “information location service” could be liable for *secondary*, if not direct, copyright infringement if it ignored obvious red flags indicating illicit behavior.¹⁸⁸ And so the battle was joined.

Clearly, an account advertising “!!!Bootleg Movie Releases!!!” would be one of those obvious red flags. But what about a music video that is unavailable even to would-be purchasers? Or a three-minute clip from a two-hour film? These are issues that can be extensively litigated, and rulings on “fair uses” of copyrighted material come down on both sides.

Thus major content owners tolerate many questionably legal uses, but try to crack down on users who engage in many unauthorized downloads and uploads.¹⁸⁹ That uneasy truce sparked a business opportunity: a video or music search engine could grab a mass audience, as long as most of its users only uploaded a few pieces of infringing content. YouTube grew to prominence on the back of the pirated content of millions of users. But as it consolidated its position as the dominant video search engine online, it began cleaning up its act.¹⁹⁰ It struck deals with major labels and independent artists, sharing ad revenue with them based in part on how many viewers and listeners they attracted. We can only know “in part” what the revenue share

is, because Google keeps the terms of the contracts strictly under wraps.¹⁹¹ But the basic industrial organization is pretty clear: like cable companies positioning themselves between subscribers and content providers, Google wants YouTube to be a broker, taking its cut of the ad revenue ultimately generated by the content it hosts.¹⁹² And that ambition is reflected in its search results.

The recording industry has been targeting music-sharing sites for years.¹⁹³ Infringers pop up at a new address each time an old one is seized, a digital game of whack-a-mole. Content owners complained for years about Google's role in enabling infringement, especially after it bought YouTube. The search giant took its usual position with regard to most complaints: not our problem. Copyright holders could litigate against the offending sites themselves, but Google would not do more work than the DMCA required it to. This did not satisfy the copyright holders, who continued to demand that important search engines address the problem by automating punishment of the worst intellectual property scofflaws.¹⁹⁴

In 2012, Google creatively capitulated to this demand. A comprehensive search engine makes it a cinch to find pirated materials—unless, of course, the search engine is trying to conceal them. Google decided to do so, agreeing to adjust its algorithm and systematically demote sites that collect multiple complaints of copyright infringement. Google's famously stubborn engineers acceded to Hollywood's demands.¹⁹⁵ Now that it is making serious money from copyrighted content on YouTube, it has an interest in assuring compensation for viewings.¹⁹⁶ It also has a brand (worth tens of billions of dollars, by some Wall Street estimates) and a business model to protect. Copyright-holders brought ad revenue to YouTube; Google had to return the favor with some takedowns of pirate havens and demotions of alleged infringers.¹⁹⁷

In its public statements, Google denied that demoting sites for copyright infringement was a significant departure from existing policy. Like everything else at Google, it was framed as just another way of making results better.¹⁹⁸ But while it certainly did make for a change in user experience, the change was not, in many users' views, an improvement. Furthermore, Google justice was swift, secret, and arbitrary. Due process did not apply. Once a critical mass of

copyright complaints accrued against a site, it just started to sink in the rankings.¹⁹⁹ Google didn't de-index it. But in an information environment where searches often result in thousands of results, being demoted to the ninety-ninth page of listings is tantamount to the same thing. And the demoted site might not even know that it had been demoted. If it looked for itself from its own IP address it might well appear near the top of the results, its own personalized signals for salience having locally overwhelmed the signals for demotion.

Google's draconian antipiracy practices also raised questions about collateral damage. For example, what happens if a site (whose intention is not infringement) accidentally or incidentally posts pirated material and loses prominence for that reason?²⁰⁰

Google's decision to serve as enforcer for the holders of intellectual property rights left unanswered many questions that are sure to arise about the laws of its secret "Googlement." But if its behavior in the past is any guide, it will address them behind closed doors. The public won't be privy to the considerations raised, the monetary interests involved, or the favors cut for one group or another. And as we'll all see the results through our own personalized search lenses, it will be well-nigh impossible for us to notice that a decision was even made, let alone assess the reasons or the effects.²⁰¹

Who Can Afford to Publish? The power of the old media is waning. Traditional journalism is in crisis.²⁰² Some predict that investigative reporting will be sustainable only as a charity.²⁰³ Broadcast media are in less serious financial trouble, but their political and cultural clout is declining, and their profit margins are threatened.²⁰⁴ Broadcast radio too is culturally less relevant as younger listeners look online for music.²⁰⁵

All of these developments coincide with—and have in part been caused by—the rise of new media, which feature online video, text, and music. Users have abandoned old *sources* of content for new ways of *searching* for it. The huge user bases that result mean that both content providers and advertisers want to seize places at the top of Google's (or Facebook's or Apple's) users' front pages.²⁰⁶ Not coincidentally, Google's U.S. advertising revenue is now greater

than that of *all* newspapers.²⁰⁷ If current trends continue, it will soon be larger than both newspaper and magazines combined. Current valuations of Facebook suggest it will capture 10 percent of global ad revenue by 2020.

Some web-based publishers feel empowered to use search engines and social networks to build audiences that would never have been possible in the analog world.²⁰⁸ But others feel that the search intermediaries have done them ill. Microtargeted advertising by companies like Google has taken an ever-increasing share of the revenue that used to be spent directly at their sites. Google's tense relationship with many web-based political publications reveals these trends. In a provocative post titled "Has Google Destroyed the 4th Estate?," prominent progressive blogger Jane Hamsher attributes the decline of the fortunes of sites like hers to Google's rise to pre-eminence in key advertising markets. A *Washington Post* story confirmed that both Google and AOL played hardball during the election of 2012, negotiating portions of political campaign ad revenue that would have gone directly to sites like Hamsher's Firedoglake in past years. The ad buyers argued that it's not space on paper or pixels on a website that matters to them, but *audiences*; that's what they were looking to buy. In other words, the context of the advertisement was mere background: what really mattered was data on who was looking at the content, and Google had far more of that than anyone else. Google could connect advertisers to a precise demographic, and in an era of campaigns based on Big Data, that secret, proprietary information was the vital edge political campaigns needed.²⁰⁹

Though media is suffering now, campaigns themselves should also beware. Saving a bit now by avoiding wasted advertising may lead to huge costs down the road if data holdings further consolidate and become the key to finding undecided voters. The *Citizens United* decision is an open invitation to tech firms to escalate the prices they charge for audiences, as billionaire donors are eager to foot the bill.

Recall again Vaidhyanathan's title, *The Googlization of Everything*. For Big Data buffs, "Googlization" is ultimately a hopeful process: systematic use of analytics to squeeze maximum effectiveness out of any decision; maximum relevance from any search;

maximum risk-adjusted return from any investment. To paraphrase Jeff Jarvis, today's businesses should ask themselves, "What would Google do?" But the answer to that question is all too clear: use their data to outflank competitors and extract maximum profits from their customers.²¹⁰

"Googlization" has an even darker meaning, too: that whole industries stand to be taken over by Google itself.²¹¹ Walmart (Walmart!) has said that it considers Google one of its most formidable competitors. Even Apple's greatest misstep—forcing Google off its iOS in favor of an incomplete and ill-conceived maps app of its own—was an (unsuccessful) attempt to compete with Google for the locational data that Google's map services were collecting.²¹² And what does "Googlization" mean to traditional publishers, booksellers, and educators, who don't have Google's opportunity to match individuals to "optimal" sources of information based on their past predilections, demonstrated abilities, and willingness to pay? That Silicon Valley engineers and managers are in charge of their fortunes.

Of course, Google isn't the only press baron on the horizon; Amazonification, Facebookization, and Twitterification also beckon. Some will further hollow out once-hallowed properties. Others will invest, as venture capitalist Marc Andreessen recommends. Though he strikes fear into publishers, Amazon's Jeff Bezos has not yet reduced writers at his newspaper (the *Washington Post*) to the status of Mechanical Turkers or warehouse pickers.²¹³ But we should not assume media independence as tech firms swallow more of the revenue that might have once gone to journalists. After Amazon inked a \$600 million deal to provide the CIA with cloud computing services, 30,000 people petitioned the *Post* with the message "*Washington Post*: Readers Deserve Full Disclosure in Coverage of CIA."²¹⁴ Such inquiries will only become more common as Washington and Silicon Valley develop more partnerships for information dominance.

Of course, we can see why large firms want to keep their industry (and government) alliances under wraps. People want to feel like there is *someone* looking out for them. Google's decision to join forces with content industry leaders (regarding piracy) disappointed many of its users.²¹⁵ They had thought of Google as *their* agent, pushing for users' rights and a neutral, technical ordering of the

Internet against the usual corporate interests' efforts to exploit it. But as Google dominates more of the search space, and as its investors' demands remain pressing, its business focus has shifted from the need to *attract more users* to the need to *monetize what the viewers see*. Google found itself needing more compelling content, and that content would only materialize for a price.²¹⁶

These are trust issues. In a classic example of what philosopher Langdon Winner called "technological somnambulism,"²¹⁷ we have given the search sector an almost unimaginable power to determine what we see, where we spend, how we perceive. Top legal scholars have already analogized the power relationships in virtual worlds and cloud computing to medieval feudalism.²¹⁸ Technological advance goes hand-in-hand with politico-economic regression.

Toward a Digital New Deal

In the late 1990s, tech enthusiasts looked to search engines as an extraordinary democratization of the Internet. They permitted content creators from all over the world to reach far-flung audiences. Web 2.0 promised even more "democratization" by enabling self-organization of virtual communities. But recent commercial history suggests a different—even an opposite—effect. The very power that brought clarity and cooperation to the chaotic online world also spawns marketing, unfair competition, and kaleidoscopic distortions of reality.²¹⁹

The first step toward reform is realizing the scope of the problem. Tim Wu, a prominent cyberlawyer and one of the intellectual architects of network neutrality, helps contextualize today's Internet disputes in a larger time frame. In his 2010 book *The Master Switch*, he animates a history of "industrial wars" over communications with strong moral judgments about the fairness or impropriety of the business strategies he investigates. The book is a tour de force of narrative. But it falls short, prescriptively. Wu acknowledges the coercive private power of an Apple or a Google but concludes that norms now restrain it: "Rare is the firm willing to assert an intention and a right to dominate layers of the information industry beyond its core business." However true that was then, it's outdated now: Google wants to expand to be a social network and

military robot company; Facebook is not just a social network, but a kingmaker in online media; Amazon disrupts industry after industry. But Wu focuses more on the cultural and political impact of information-age giants than on the grubby economics that drives this rapid-scale expansion.²²⁰

I can understand why—people are far more interested in the outsized personalities of Silicon Valley than the complex money grabs that grant them their platforms. But we can't hope to reform the information economy without fundamentally changing the incentives at its core. Wu's postmaterialism would have been a good fit for the roaring nineties, when a rising tide of Internet firm profits seemed to be lifting many parts of the economy. But the economic crisis that has overtaken the United States since 2008 makes our time in many ways more similar to Franklin Roosevelt's era than Bill Clinton's. A small cadre of the lucky, the talented, and the ruthless are taking an enormous share of the revenues generated by new Internet technologies. They keep their methods strictly proprietary while reaping huge returns from content put out in the open by others.²²¹ Like the megafirms and CEOs that the New Deal helped bring to heel, the leaders of our largest tech firms have been very quick to misestimate personal enrichment with the public good.

It is time to bring the substance and style of that era back into a progressive political economy of technology. In the first half of the twentieth century, the American lawyer, economist, and educator Robert Lee Hale studied the dominant firms of his day. Given their pervasive influence, he argued that personal freedom depended on responsible corporate conduct.²²² His theories were influential among FDR's advisers as they faced the economic catastrophe of the 1930s. Hale and Wu have both analyzed the "private coercive power" of large companies. But there are major differences between Hale's *Freedom through Law* and Wu's *The Master Switch*, and they speak volumes about changes in the American political climate over the past six decades.

Hale's work chronicles the gradual victory of democratic constraint over arbitrary and exploitative business practices. Hale discussed the "principles for determining how the wealth of the community should be distributed," patiently detailing the case law of ratemaking and

taxation through the mid-twentieth century. He also made it clear that government couldn't just sit idly by as a "neutral party," in order to "avoid picking winners" in a time of technological change. If it failed to do so, there were other forces—such as finance—more than willing to step in and direct the economy. And we now see the results: monopolistic and manipulative behavior that has left many wary of a sector they once adored.

The search sector's profiteering is an effort to meet the demands of investors. Search firms may rank and rate the reputation companies that rank and rate people; but even search firms have to worry about how *they* are being rated by Wall Street. They can't keep swallowing up rivals unless investors keep betting on their enduring dominance. Opaque aspects of finance keep the leading Internet firms on their toes as surely as the Internet firms' mysterious ranking mechanisms keep everyone else alert and worried about any possible loss of standing. It is therefore to this final and most forceful aspect of the new political economy—finance—that we now turn our attention.

6

TOWARD AN INTELLIGIBLE SOCIETY

NOVELISTS SEE THINGS about our lives in society that we haven't noticed yet, and tell us stories about them. These prescients are already exploring black box trends.

In his story *Scroogled*, Cory Doctorow imagines a Google tightly integrated with the Department of Homeland Security. Doctorow's Google is quite willing to use its control of information to influence politics—for instance, striking fear into the hearts of Congressmen by threatening to let scandalous tidbits about them rise in the rankings of its media finders. One character observes that “the Stasi put everything about you in a file. Whether they meant to or not, what Google did is no different.”¹

Doctorow's story confronts us with a stark question: Do we permit Google to assert trade secrecy to the point that we can't even tell when a scenario like that has come to pass? When *Scroogled* was published in 2007, critics dismissed it as alarmist. But its core conceit—shadowy partnerships and power struggles between Google and the government—is already a reality. Google's ever-expanding footprint—into the home (Nest), car (Waze), space (satellite investments), and workplace (Google Enterprise), and its ability to buy data from hundreds of brokers, makes “total information awareness” by the company less a paranoid fear than a prosaic business plan.²

Gary Shteyngart also paints a grim picture of shadowy corporate behemoths in his dystopian *Super Sad True Love Story*, a work that has been favorably compared with *1984*. Powerless to challenge finance and homeland security giants, Shteyngart's characters scramble for places in the social pecking order by desperately competing with each other. They measure their "personality" and "sexiness" ratings with smartphone apps. Their credit scores are conveniently (and publicly) displayed at retail establishments. Like Calvinists striving to look like members of the elect, Shteyngart's characters hustle to boost their numbers. They don't worry much about what the scores signify or how they are calculated; they just want high ones. Black box rankings are a source of identity, the last "objective" store of value in a world where instability and short attention spans undermine more complex sources of the self.³

Globalized finance is the focus of *Union Atlantic*, Adam Haslett's cautionary tale of Wall Street. In Haslett's novel, a ruthless trader makes highly leveraged bets while his bosses and the compliance department look the other way. Corrupted by power and the high of unrestrained gambling, the trader comes to see himself as "an artist of the consequential world," the "master of conditions others merely suffered." And "suffer" is the right word—his actions leave a trail of human wreckage in their wake.⁴

In the work of seers like Doctorow, Shteyngart, and Haslett, the mutual influence of personal character and social structure is clear. Black box insiders are protected as if they are wearing a Ring of Gyges—which grants its wearer invisibility but, Plato warns us in *The Republic*, is also an open invitation to bad behavior.⁵

For those on the outside, another Platonic metaphor is apt. In the Allegory of the Cave, prisoners chained to face a stony wall watch flickering shadows cast by a fire behind them. They cannot comprehend the actions, let alone the agenda, of those who create the images that are all they know of reality. Like those who are content to use black box technology without understanding it, they can see mesmerizing results, but they have no way to protect themselves from manipulation or exploitation.⁶

The Black Box Society

Black boxes embody a paradox of the so-called information age: Data is becoming staggering in its breadth and depth, yet often the information most important to us is out of our reach, available only to insiders. Thus the novelists' preoccupation: What kind of society does this create?

It Creates a Rule of Scores and Bets. Of all the reputational systems I've discussed, credit scores are by far the most regulated. Yet regulation has done little to improve them. Penalties for erroneous information on credit reports are too low to merit serious attention from credit bureaus. The fact of scoring has become a law unto itself. It encourages us to internalize certain standards and punishes us for failures. Television commercials feature tales of woe about those who let their credit scores slip, and some pitilessly equate low scores with laziness and unreliability.⁷ The sponsors of these ads profit from the insecurity they both publicize and reinforce. They don't include in their moralizing the top financiers who walk away unscathed from their own companies' debts when too-risky bets don't work out.

The importance of credit reputation grows as public assistance shrinks.⁸ Austerity promotes loans as a lifeline for an insecure precariat. Students who once earned state scholarships are now earning profits for government or private lenders. In our "market state" and "ownership society," *private credit* rather than *public grant* is the key to opportunity. Would-be homeowners, students, and the very poor are forced back on commercial credit to buy places to live, to prepare for careers, or even just to pay the costs of day-to-day living. By and large, private lenders are simply looking to generate more private wealth, rather than to invest long term in individuals or communities. In the paradoxical world of black box finance, those gains may be predicated on bets *against* a loan's repayment (if I've swapped away the risk of default, I may gain if the borrower fails). And when powerful actors are profiting from failure, we can probably expect a good deal more of it in the future.

It Creates Separate and Unequal Economies. Reputational systems for ordinary citizens and for high financiers have diverged to the point that they hardly operate in the same economy.

When a credit bureau rates a consumer, she doesn't get to consult it first about how to structure her finances for the best possible score, or lobby it to adjust its methodology so as to downplay her weaknesses and reflect her strengths. The bureau's interest lies with the firms who demand its services, not with her. But when the sponsors of structured securities need an AAA imprimatur to market their wares, they can pay \$200,000 and more for their ratings. That is significant lobbying power. Furthermore, they enjoy extensive consultation from their raters on exactly how far they can push the risk envelope without adversely affecting their rating. And at least so far, when things go south, few at the top—either at the sponsors' companies or at the raters'—suffer serious financial consequences.

Compare their fates to those of the unfortunate students who are saddled for life with undischageable debts. Students may carry their loans at rates of 7% or more, while banks access credit at less than 1%. This disparity may seem appropriate on its face; Citigroup and Goldman Sachs certainly have more assets than the average college student. But they also have more liabilities. The real reason that they are more creditworthy than a collegian is that *the government itself* implicitly or explicitly backs them.⁹ There's no theoretical reason that interest rates couldn't be reduced for students and raised for banks. But students lack the backroom connections that the finance sector so richly exploits.¹⁰

Of course, there has to be some federal support for financial institutions—the bank runs of the Great Depression were too devastating for us to go back to 1920s-style laissez-faire. But the price of government support used to be an intricate set of regulations that strictly limited the risks banks could take. The Dodd-Frank Act of 2010 was supposed to adapt such risk regulation to the contemporary finance sector, but it is being implemented so slowly (and so incompletely) that it is hard to credit it as anything more than window dressing.¹¹ It promises that Congress is “doing something” while leaving enough legal loopholes to ensure that little changes.¹² And the quid pro quo between banks and government remains stacked in the banks' favor.

It Creates Invisible Powers. The rise of algorithmic authorities elicited widespread anxiety. In 1972, philosopher Hubert L. Dreyfus wrote a booklength treatise titled *What Computers Can't Do*.¹³ Computational pioneer Joseph Weizenbaum worried that callow managers would delegate to software “tasks that demand wisdom.”¹⁴ At first, managers tried to quell concerns by emphasizing the transparency and objectivity of their systems. An algorithmically driven computer would operate dispassionately, it was argued, treating like cases alike. Avant-garde academics even advanced computation as a model for the legal system, where the jury was frequently disdained as a “black box.”¹⁵ Jurors met behind closed doors. But with algorithms, those who doubted results could look “under the hood” and see for themselves how the system worked. The disclosure requirements of patent law promoted transparency by making intellectual property protection conditional on publicly inspectable, written descriptions of claims.

In time, however, this relatively open approach was neglected; knowledgeable but unscrupulous individuals learned how to game exposed systems, and the profit advantage of informational exclusivity was too strong to resist. The less known about our algorithms—by spammers, hackers, cheats, manipulators, competitors, or the public at large—the better, went the new reasoning. Transparency was replaced by ironclad secrecy, both real and legal. The matter of legitimacy was tabled.

Trade secrecy protection effectively creates a property right in an algorithm without requiring its disclosure. It also reinforces the importance of keeping algorithms secret, because once they are disclosed, they lose trade secret protection as a matter of law. Rules of state secrecy provide an even more formidable legal armamentarium when national security is at stake. This move from legitimization-via-transparency to protection-via-secrecy was the soil out of which the black box society sprang, and with it, many of the social dangers of the information age.

It Sets Up Wasteful Arms Races and Unfair Competitions. In more and more aspects of our lives, computers are authorized to make decisions without human intervention. Philosopher Samir Chopra and attorney Laurence White call these programs “autonomous artificial agents” (AAAs)—*agents* because they act on behalf of someone;

artificial because they are not organic persons or animals; and *autonomous* because they can perform actions without checking back in with the person who programmed them or set them in motion.¹⁶

Of course, AAAs are not new, and it's great not to have to get up to flick switches every time the dishwasher reaches a new stage of its cycle. But AAAs have infiltrated areas far more intimate and important than the mechanical. They engage in bidding wars for books on Amazon, and have transformed stock trading. They automatically gather and process certain information as you interact with apps and websites. Think back, also, to the privacy conundrums posed by Google's autocompletes. Credit scores are not the only algorithmic threat to reputation.¹⁷

Some progressive thinkers think the answer is "bots of our own," a digital arms race where the savvy field their own AAAs to do their bidding. But such "solutions" invariably run up against old-fashioned patterns of power and privilege. However sophisticated your bots may be, they're not going to be able to negotiate for better privacy terms for you at the most important websites. They are "take it or leave it" operations. And who is to ensure that information-gathering bots—governed by algorithms themselves—will actually stick to the terms of the "contracts" they strike in their instantaneous and unsupervised interactions online?¹⁸

The problems of computer-computer interaction are even deeper in search-driven finance. The day trader in Dubuque isn't going to own the computing power of the algo-trading sharpies in Manhattan. Nor will he be accessing the \$300 million cable between New York and Chicago that was built for the professional traders.

Legal scholars have written penetratingly about the intertwined failures of technical and legal compliance systems in finance. They have outlined commendable ideas for changes in the current regulatory framework. Nevertheless, Wall Street deal making is now so tortuous that Disclosure 2.0 is not going to cut it. A system where financial firms are "pursuing the maximum level of profits and return on equity, without heed to systemic risk or the interests of all the stakeholders in the money grid" is a guarantee of future stagnation and crisis.¹⁹ Moreover, better documenting endless processions of fundamentally valueless transactions is not a worthwhile aim.

Why Is So Little Being Done?

Shadowy powers, sweetheart deals, and wasteful arms races aren't very appealing. Yet they're at the core of black box trends that seem only to accelerate with time. Why is so little being done about them? To answer that question, we need to understand why algorithmic authorities are so appealing to so many. I've hinted at the lure of the black box throughout the book, but now it's time to surface its seductions—and their limits.

The Glamor of Rocket Science: Eager to tout the U.S. economy as vibrant, politicians trumpet the achievements of our tech firms. But the darkness of the new Big Data economy should also give us pause about the outsized returns its top CEOs, managers, and investors are now earning. Is their market advantage attributable to genius and skill? Or does their Big Data advantage make their profits a near inevitability, potentially gleaned by any smart group of computer scientists and business experts? The mainstream media seems wedded to the “superstar” characterization, reflecting a widespread assumption that earnings inequality results from “skills-biased technological change.” But merely being part of a platform with ever more data is not exactly a “skill.” It instead recalls the dominance of early telephone or telegraph networks: the monopolistic power of a utility everyone must have access to in order to function in a modern society.²⁰

Law developed various approaches to these utilities. The telephone company couldn't simply cut businesses off if they failed to pay rising shares of their revenues for services. Rate increases had to be plausibly connected to productive investment, or a documented rise in the firm's costs. Firms had to act in a nondiscriminatory manner, and there were limits on the degree to which they could use their privileged access to communications for their own commercial advantage.²¹ My proposals in the previous chapter applied those ideas to today's reputation and search firms.

Addicted to Speed: High-tech firms have a parry at the ready: government is far too slow to keep up with the fast pace of change in *our*

world.²² Lobbyists for black box industries mock the capacity of government to comprehend the business practices of a Google or a Goldman.²³ But, as I showed in the previous chapter, there are clear precedents for agencies to hire private-sector expertise to assure that laws are faithfully executed. The government's successful curbing of health care fraud could serve as a model for dealing with many other kinds of skulduggery, if there were the political will for it. And the understanding.

This latter requirement is worthy of note. I was at a conference dinner talking about some basic principles of search neutrality when a Silicon Valley consultant said abruptly, "We can't code for neutrality." He meant that decisions about fair treatment of ordered sites could not be reduced to the algorithms that drive most sites' operations. When I offered some of the proposals I've made in this book, he simply repeated, with a touch of condescension: "Yes, but we can't *code* for it, so it can't be done." For him, not only the technology, but even the social practices of current operations are unalterable givens of all future policy interventions. Reform will proceed on the Silicon Valley giants' terms, or not at all. He assumed that if decisions couldn't be made at the speed of current searches, they oughtn't happen.

It is not helpful to have politicians across the political spectrum meekly submitting to this technolibertarianism—assuming that bureaucrats, and by extension themselves, are inherently incapable of influencing technical innovation. We must curb the tendency to reify the tech giants—to assume that their largely automated ways of processing disputes or handling customer inquiries are, inevitably, the way things are and must always be. Until we do, we enforce upon ourselves an unnecessary helplessness, and a self-incurred tutelage.

The arbitrariness of many forms of reputation creation is becoming clearer all the time. I will not recapitulate here the problems of discrimination (racial, political, economic, and competitive) that we examined earlier. Unfairness in today's Internet industries should be obvious by now, and is another important reason to be wary of reification. "The Internet" is a human invention, and can be altered by humans. The argument that search and reputation algorithms

are what they are and must be so forever appears to carry a lot of conviction in some quarters, but it is a self-serving oversimplification and no true reflection of reality. As Google's concessions to European Union authorities in both privacy and antitrust cases show, it is possible to create a more level online playing field. But there must first be a clear recognition of the need, and then the will to act on it.²⁴

Our technologies are just as much a product of social, market, and political forces as they are the outgrowth of scientific advance. They are intimately embedded in social practices that rely on human judgment. Facebook hires people to assess the appropriateness of user-shared content; it's no great burden upon the social networking behemoth to ask its human reviewers to stop algorithmic recommendations of obviously racist stories.²⁵ Google runs proposed algorithmic changes by human testers, who not only choose the web pages that work best, but explain *why*. Such interventions are already an essential part of the business logic of these companies; they can equally be part of their response to legal norms and obligations.²⁶ And when the technology really does outstrip policymakers' understanding, they can hire experts to bridge the gap. A government attorney has already hired Silicon Valley's Palantir to go after Wall Street crooks; it's time for more law enforcers to follow his lead.²⁷

Scale Fails: In Wall Street valuations, attaining *scale* at great *speed* is critical to attracting *speculative* capital. The goal is not just a fast rate of growth, but an accelerating one. Speculators pave the way for more "committed" capital, and theoretically enable a virtuous cycle of success, recognition, and investment.²⁸ Platforms like Google and Facebook too accrue their power on the basis of scale. Aspiring to the same end of total information awareness, data brokers are angling to become the proprietors of the "master" profiles coveted by marketers and spies alike.

The idea is to take a few pennies each from millions of transactions, as quickly as possible. Prove that you can do that consistently, and finance capital will beat a path to your door. Capturing a small piece of everything, speedily and at very large scale, is about as close

as one can get to the “free money” touted by an AIG grandee in 2007 as the holy grail of wealth accumulation.²⁹

But what happens to wise judgment when businesses “scale” too fast? Mortgage securitizers didn’t spend the hours it would take to review each of the hundreds of mortgages packaged into asset-backed securities. Google and Facebook are rarely willing to individualize reputational or copyright disputes. “Automated dispute resolution” at the finance and data barons leaves many out in the cold. Far more don’t even try to engage, given the demoralizing experience of interacting with cyborgish amalgams of drop-down menus, phone trees, and call center staff.

There are ways to humanize these processes, via both internal reviews and external appeal rights. My proposals to that end in the previous chapter were not designed to juridify every interaction between company and customer, but to afford persons the dignity of being able to make their case to another person, with a chance at appeal to higher authorities if their complaint was treated in an unreasonable way.³⁰ Due process obligations have sometimes been imposed on private-sector reputation creators, occasionally even to the extent of forcing the exposure of proprietary methods. The quality of sites that rate doctors improved when regulators demanded that they reveal key data and models. Credit rating agencies would be well advised to learn from their example, and to do far more to examine the integrity of the data they use.³¹

But there will be a real cultural shift only when platforms with populations rivaling those of small countries—like Google, Facebook, Amazon, Microsoft, and Apple—adopt, either voluntarily or on compulsion, more responsive approaches to those who claim to have been harmed by them. This process is beginning outside the United States, in countries with a more advanced jurisprudential recognition of the essentially statelike characteristics of very large firms. Germany, Argentina, and Japan, for example, have all required Google to alter certain search results that defame individuals or mislead users. Institutionalizing these decisions in less formal settings than a court of law—for instance, in NGO-led arbitration panels—will be a very important step toward treating Internet users with dignity, rather than as mere algorithm fodder.³²

Spellbound by Speculative Capital: Dignity and fairness are not impossible aspirations. But they cost money. The overriding reason that most finance firms resist accountability is economic: to maximize pay at the top and to continue attracting more capital. Their leaders deserve to reap some rewards from their skill and vision. However, there are also questions to be asked about exactly what these immense rewards derive from, and at what cost.

Those questions were asked when regulators and courts in the first half of the twentieth century established the concept of “reasonable rates of return” for utilities. They acknowledged the vital importance of the infrastructure on which society depends, and they validated the right to compensation for upholding that responsibility. But they limited the right of owners and administrators to hold society hostage with unreasonable demands for money, and they required as well that compensation be conditional on the provision of safe and reliable service.

Certainly banks are a vital piece of our infrastructure—QED the need for 2008’s bailouts. How might the doctrine of reasonable rates of return apply to them? Where is the balance point between importance and responsibility? When do rising fees start to look like price gouging? What counts as safe and reliable service? Above all, what are these giant salaries and bonuses really *for*? What value does society derive from the work that they theoretically compensate?

For context, consider that the average Ph.D. research scientist working on a cancer treatment takes home roughly \$110,000 to \$160,000 a year. But a banker specializing in mergers and acquisitions is likely to realize about \$2 million; his CEO, tens of millions. Top hedge fund managers make billions of dollars annually; their shadowy maneuvers are not open to public scrutiny, except on the rare occasions they catch the attention of authorities for insider trading.³³

Some would argue that bankers make their money for taking risks. But if they are using black box techniques to risk other people’s money with no personal exposure, their self-characterization as fearless captains of industry is scarcely credible. Such huge takes create inflated expectations throughout the economy the way inflated grade-curves do in schools; how can health reformers ask surgeons to accept lower salaries when their friends in finance are so

much richer? The bankers' bounty fuels a derangement of value and deteriorating values.

Banks charge plenty for their vital services. Consider that late fee on your credit card; even before you incurred it, the bank had already taken a cut of every purchase you made. Consider the mysterious charges eating away at your 401(k), and the transaction costs whenever your broker buys or sells. Fee churning contributes hugely to the livelihoods of finance professionals. But how much value do those professionals really create in the process?

Not much, it would appear. The crisis of 2008 is only the most recent demonstration of how the quick "scores" of financial intermediaries drain resources *away* from Main Street investors. Former investment banker Wallace Turbeville estimates that America's "excessive wealth transfer to the financial sector is in the range of \$635 billion per year."³⁴ A study from the New Economics Foundation (NEF) calculated that leading London bankers "destroy £7 of social value for every pound in value they generate."³⁵ The Kauffman Foundation concluded that an "ever-expanding financial sector is depleting the talent pool of potential high-growth company founders."³⁶ Why go to the trouble of developing a new product or service when you can take on much less risk, and net more money, as a financier rating and juggling investments?³⁷

Whatever one thinks of their methods, at least Turbeville, NEF, and Kauffman are asking tough and necessary questions about how the world of finance interfaces with the real economy. The first step toward a realistic assessment of value in the financial sector would be to estimate what returns reflect productive contributions to the economy, and which are attributable to fee churning, accounting shenanigans, and rate rigging.³⁸ It would be a sobering exercise.³⁹

Researcher Thomas Philippon confirms that finance firms are becoming more expensive even while they pride themselves on forcing managers in other industries to cut costs and reduce wages.⁴⁰ Macroeconomists J. Bradford DeLong and Stephen Cohen calculate that the United States experienced a 7 percent drop in manufacturing concomitant with a 7 percent expansion *in financial transactions*. When we shift labor from real engineering into financial engineering, we're

effectively privileging those who shuffle *claims on productivity* over those who are actually *producing* real goods and services.⁴¹

This means, for example, that Wall Street has pressured pharmaceutical firms to lay off thousands of drug developers and cut R&D in favor of “core competencies,” punishing Merck for investing in research and rewarding Pfizer for cutting it. The constant pressure for quarterly earnings makes each cut to scientific investment look rational at the time, but the long-range consequences are chilling—both medically for all of us and economically for the millions of Americans who are exiled from relatively prosperous sectors into low-paying service jobs, or worse. Is it any wonder that those outside finance feel like they are bickering over slices of a shrinking pie?⁴²

The finance sector at present is more invested in positional competition for *buying power* than in increasing goods and services *available to buy*.⁴³ This is a zero-sum game in which the goal is not sustainable investment or the construction of lasting value, but complex risk-shifting that mulcts the unwary. The self-seeking might be excusable if its leading exemplars weren’t so abjectly dependent on public subvention to stay afloat. Given their too-big-to-fail status, we should expect far more in the way of public service from these critical financial firms than we are currently getting.

Makers, Takers, and Fakers: The grand illusion of contemporary finance is that endlessly processing claims to future wealth will somehow lead to a more productive economy.⁴⁴ A similar illusion is beginning to pervade the industries of search and reputation. Intermediaries can get rich not by adding to the sum total of goods and services created, but by setting up bidding wars—for a chance to finance an investment, to appear before an audience, to qualify for an opportunity. There is good reason that these entities strive so hard to keep their methods secret: pull the curtain, and the economy’s wizards look like little more than organizers of contests they’d never be able to compete in. They aren’t players, but referees. In the meantime, the millions of creators whose labor is being so lucratively rated and searched and shuffled are herded into ever more competitive, global labor markets. Left to their own devices, the reputation, search, and finance sectors will continue to siphon

effort out of productive innovation and into more shuffling and scrambling.⁴⁵

We say we value “makers” over “takers” and “fakers.” But we need an *intelligible* society if we want to be able to tell who’s who. Internet firms are not helping us achieve that goal, thanks to clandestine deals between intermediaries and content owners. Secretly slowing down or downranking pirate sites does little to solve the underlying problems of the content industries—or the individuals they (used to) provide income to.⁴⁶ Perfect control schemes online would grant too much control to copyright holders, trampling free speech and a thriving remix culture on their way to that singular aim. But control is only one route to compensation. The recording industry itself has repeatedly (and successfully) lobbied to force composers and lyricists to accept a governmentally set compulsory license.⁴⁷ In the past, when Congress realized that new technology would lead to widespread copying, it imposed a small fee per copy—a practice known as compulsory licensing. This regime, still in place for many works, separates compensation (for works) from control (over their use).

Some say that the compulsory licensing regime can’t work in the wild west of untrammelled Internet distribution. But Harvard law professor William W. Fisher has offered a detailed and compelling proposal in *Promises to Keep: Technology, Law, and the Future of Entertainment*. The Fisher plan would subsidize culture by lightly taxing the technology that leads to its uncompensated duplication. Government could also impose such fees on carriers and search engines, and distribute them to creatives.⁴⁸

Who gets the money? Fisher wants artists to be compensated according to how often their work is actually viewed, or listened to; Dean Baker has called for “artistic freedom vouchers” that would allow taxpayers to choose *ex ante* whom they want to support each year. Either approach is likely to be more efficient than the current bramble of copyright law and disorderly, secret downrankings. In 2004, Fisher estimated that a fee of \$6 per month on broadband subscribers would cover all the music and movie industry revenue allegedly lost due to piracy.⁴⁹

Of course, given extreme and rising inequality, such fees will need to be capped and, hopefully, progressively keyed to income

and wealth. They are probably best collected as a sliding-scale user fee. A small tax on the unearned investment income of wealthy households would also help here, just like the one imposed to help fund the Affordable Care Act. Like health care, culture has positive externalities. It deserves more support from those best able to pay for society's common needs.⁵⁰

Unfortunately, the Recording Industry Association of America and the Motion Picture Association of America appear about as enthusiastic for a public option in entertainment as private insurers have been about it in health care. Thanks to that opposition, some might dismiss Fisher's idea as a pipe dream—nothing even remotely resembling a new tax could pass through our political system, right?⁵¹

But what is the alternative? The leading legislative initiative of the content industry in 2012 was the Stop Online Piracy Act (SOPA), a bill that would grant sweeping, unprecedented powers to copyright and trademark owners, deny due process to alleged infringers, and menace free expression. Like fusion centers, SOPA would accelerate surveillance by an unaccountable industry-government partnership. What does it say about our Congress that it is readier to turbocharge a police state, largely in the service of content industry oligopolists, than it is to revise and expand a venerable licensing method to support struggling journalists, artists, and musicians? Make content affordable and accessible, and the piracy problem will decline precipitously.⁵²

In an increasingly self-defeating manner, contemporary American politics has privileged policing and punishment, while marginalizing the welfare state and its support for the arts and the commons. Black box interventions by carriers and search engines merely take this punitive impulse into the private sector, where it is unbalanced by the usual reporting requirements and appellate checks on law enforcement abuses.⁵³

Without the adoption of digital compulsory licenses or artistic freedom vouchers, we should not be surprised if the political economy of intellectual property enforcement shifts to vertically integrated firms that use control over bottlenecks to monitor, deter, and perhaps ultimately ban content that threatens profits. SOPA ultimately failed, after provoking a powerful alliance of netizens to

support basic principles of due process, free expression, and accountability online. But this battle was merely a prelude to a much more contested debate about the proper allocation of digital revenues. Like health care battles between providers and insurers, struggles between creatives and intermediaries will profoundly shape our common life. Stopping SOPA is only one small step toward preserving a fair, free, and democratic culture online.⁵⁴

We should also be open to skepticism about technocratic solutions.⁵⁵ To work well, Fisher's proposals would rely on pervasive surveillance of what is being listened to and watched. If purely based on "number of downloads" or "number of views," they'll provoke extensive gaming. We've already seen scandals on YouTube for artists who allegedly manipulated their view count (either to gain more ad revenue or to appear more popular than they actually are). That gaming will in turn provoke countermeasures, monitoring who is viewing and liking what. Do we really want some central authority to collect all this information, merely in order to ensure that Lady Gaga gets, say, 50 times more revenue than the Magnetic Fields?

Allocating entertainment industry revenue in this way may become an instance of "modulation," an effort to monitor and exercise soft control over certain communities (here, artists).⁵⁶ We should reconsider the plasticity of institutions like compulsory license fees. Maybe there should be minimum compensation, to assure some degree of security to all artists (WPA 2.0?), and maximum gains, to discourage gaming at the high end. Perhaps the aspiration to precisely calibrate reward to "value," as measured by the number of times something is viewed or watched, fails on its own economic terms: a particularly effective film may do its "work" in one sitting. Or someone might reasonably value one experience of a particularly transcendent song over 100 plays of background music.

The larger point here is that there is not just a tension between the play of creativity and the copyright maximalism of dominant industry players. Even the most progressive reform proposals can unintentionally warp creative endeavors in one way or another. The legal establishment has more often than not tried to wall out these considerations: "We'll worry about the law and the money, and let the artists themselves figure out the creative angle." But the experi-

ence of play and creativity are at the core of the enterprise—they shouldn't be treated as “add ons” or independent of legal deliberations. We can't get cultural policy right if we fail to consider what better and worse modes of artistic creation are on the terms of creators themselves.

What if it turns out that properly calibrating risk and reward is a near-impossible task for law? I'm reminded of the insights of John Kay's *Obliquity: Why Our Goals Are Best Achieved Indirectly*, and in that spirit, let me make a side observation on the way to my point. At least in my experience, the best way of predicting whether someone would pursue a career in the arts (or as an entrepreneur) was the wealth of their spouse or family. The word is out: it's simply too risky to try and make a living as a painter, musician, actor, or poet—particularly given constant pressure for cuts to welfare benefits, food stamps, and Medicaid in the United States.

But in other countries, where the social safety net has been more generous, the possibility of failure has not been so bone-chilling. Consider the fate of J. K. Rowling, who hit “rock bottom” (in her words) while writing, and had to rely on Britain's benefits system. A few years of support allowed her to get a foothold in the literary profession—and without it, *Harry Potter* might never have been written. The implementation of the Affordable Care Act in 2014 is one bright spot for the marginally employed in the United States. Perhaps we'll find, decades hence, that the biggest impetus to artistic careers (and independent employment of all kinds) was guaranteed issue of health insurance policies via state exchanges, and subsidies to purchase them. Perhaps the health policy experts will do more to advance creativity than all the copyright policymakers combined, simply by assuring some breathing room for the inevitable throng of failures in creative industries.

I know, the tired rhetorical dichotomy between good old-fashioned American capitalism and the evils of socialism will be wheeled out against this approach. But what's more statist—a) DHS contractors busting down the doors of copyright infringers, b) an all-seeing Google/YouTube/Facebook check-in system to report on what you're watching, or c) a universal basic income that greatly reduces the need to deploy a or b? The specter of socialism becomes

an ever more laughable distraction as the interpenetration of state and business in finance and law enforcement serves an ever narrower set of interests.

On the Narrowing Divide between Government and Business

The “free markets vs. state” battles that devour American political discourse refer to a duality that is increasingly more apparent than real. Consider health care. On the one hand, that “market” is riddled with state-mandated licensure and quality regulations; on the other, even government programs like Medicare rely on private contractors that determine eligibility, deliver benefits, and profit from their delivery. Finance’s patterns are similar. Even as quintessentially “market” an institution as the Chicago Board of Trade can only operate within a framework of rules. Moreover, those affected by the rules are constantly jockeying to change them or use them to their own advantage.⁵⁷ Google’s corporate lobbying spend was second only to that of General Electric in 2012.⁵⁸

We all know that market orderings are influenced by political decisions, which are influenced by the market in turn as the beneficiaries of past political decisions use moneys gained in commerce to further future political ends.⁵⁹ For example: when mortgage-backed securities began to fail after years of exploitation of subprime borrowers, U.S. financial institutions were quick to turn to the government (the president, Congress, and Federal Reserve), which moved equally quickly to protect their prestige. The government did not, however, offer the same protection to ordinary borrowers. “Banks got bailed out, we got sold out,” as the protesters’ refrain goes. Large financial firms then went on to leverage their financial windfall into future political advantages, as they deployed legions of lobbyists to water down the Dodd-Frank Act and its subsequent implementation.

Furthermore, elite panic over *financial* markets—in this case, the failure of overleveraged firms—was quickly characterized by key officials as an understandable and appropriate response to a mortal threat to the economy. The desperation of ordinary borrowers was met with the Kafkaesque Home Affordable Modification Program

(HAMP)—an intervention as slow and feckless as its clunky name suggests.

Many call business's influence here "capture," since industry has more power over its regulators than the regulators have over industry. But "capture" is too static a term for what is really going on. There is not a stable "Wall Street" capturing an equally inert SEC or Fed. Rather, certain parts of industry skillfully outmaneuver rivals, gain power in agencies, and change their agendas. The new regulatory environment favors certain firms and disadvantages others. The firms boosted by the new order have even more cash to influence *newer* orders. Those adept at shuttling between Washington, New York, and (now) Silicon Valley can drive an agency (and an industry) far from its original set of values, aims, and strategies.

The Yale social scientist Charles E. Lindblom suggested a better term than capture for this mutual influence and transformation: "circularity."⁶⁰ As we settle into the age of information, the revolving door between government and dominant business sectors is clearly on the rise, with unsettling implications. It is *people*, not some nameless abstraction like "industry," who've set up the rules of our black box society.⁶¹

The stakes are too high for us to ignore this new reality: that politicians and bureaucrats will contravene only so far the interests of a business community they aspire to join or serve. The American state, which since at least the Sherman Act of 1890 has had the job of taming monopolization, is now liable to promote the economy's biggest winners, rather than to ensure a level playing field for future competition. Furthermore, the state's immense powers of compulsion and enforcement can now be enlisted in support of the black box technologies of the search, reputation, and finance sectors. Pundits overlook real dangers to indulge a puerile fixation on the obsolete polarity between "state" and "market" solutions. This is a recipe for paralysis and worse; it is a guarantee that we will never achieve the societal ideals of security, fairness, and dignity that most of us desire, if not always in identical detail. It is time to take a fresh look at where we want to go from here, and at what gets in our way.

The Promise of Public Alternatives

Government regulates not merely to promote private wealth, but because industry performs some essentially public functions along with its private profit-seeking ones. If we as citizens were to promote those public functions *directly*, we might begin to see some real accountability.

For example, government might commission a *public* credit scoring system, and test its predictive power against closed, proprietary services.⁶² We know from experience that open-source software can function as well as—sometimes better than—proprietary algorithms, and there's no reason why this shouldn't be true of a public scoring system. Once it got fully up to speed, financial regulators could require some lenders to use the transparent system, or arrange pilot programs for its partial deployment.⁶³ Public credit reporting systems are used in other nations.⁶⁴ If the concept of transparent evaluative standards succeeded in consumer finance, it might come to play a larger role in reputational software generally. Furthermore, a system fully open to the scrutiny of thousands of experts invested in its success could see its errors and omissions caught and fixed more quickly (and fairly) than one understood, valued, and monitored by only a few.

Public Internet firms are another possibility. At the moment, Google and Amazon are approaching the status of book duopolists, with Google taking on the more public function of scanning, indexing, and archiving books that aren't (individually) commercially viable. Where is the Library of Congress (LOC)? Cultural theorist Siva Vaidhyanathan makes the telling point that in Google Book Search, a private firm "step[ped] into a vacuum created by incompetent or gutted public institutions." Its very existence points to what Vaidhyanathan calls a "public failure."⁶⁵ An LOC archive could provide a content base for a public book search program. Just as Medicare offers benchmarks for coverage decisions and for private insurers' payment rates (and provides access to care for those not served by private insurance markets), a public book search could both complement Google Books and assist those not served by it.⁶⁶ It would organize the vast digital database in a transparent way, allowing us

at least one book recommendation system that is both comprehensible and comprehensive.

Presently, we have little sense of exactly how systems like Amazon's or Google's recommend books on topics like "obesity" (do you see books promoting or critiquing diet pills first?) or "conflict in Palestine," or "bank regulation," or "Google's antitrust problems." A public ordering would provide some opportunities for library scientists to apply venerable theories and principles to contemporary problems of filtering and ranking. An NGO like the Digital Public Library of America Foundation could add another perspective, too, if only it had access to the data driving Google's and Amazon's dominance.

The problems in finance are deeper than those in the reputation and search sectors, and deserve a more thorough response. Government should establish a more balanced reciprocity with the finance sector, exacting control in return for its implicit and explicit subsidies. Once again, the health care sector has led the way. Like the major financial firms, major hospitals are dependent on governmental support. The Medicare and Medicaid systems offer several forms of subsidy. But hospital participation in those systems is conditioned on their maintaining quality standards, providing emergency care, and submitting to extensive audits. Financial regulators merely aspire to do a small fraction of what health regulators regularly achieve.

It doesn't need to be this way. The Federal Reserve could open its low-interest "discount window" only to banks that act responsibly and that allocate capital in ways that improve productivity, rebuild infrastructure, reduce inequality, and recognize the value of all labor.⁶⁷ Congress could require agencies like the Securities and Exchange Commission and the Commodity Futures Trading Commission to create incentives for straightforward and socially valuable investment. A financial transactions tax would also deter the complex trading schemes behind some black box finance, and the volatility they engender.

Furthermore, the government could encourage citizens to reward transparency and punish unnecessary complexity, after the style of the (spontaneous) social movement to "Move Your Money" out of the big banks. It could permit post offices to offer banking services, providing a valuable low-cost option to the millions of "unbanked"

Americans.⁶⁸ This is not a radical idea: the Bank of North Dakota has offered the state's farms and businesses loans for almost a century.⁶⁹ Public banking might also provide incentives for investments in the social good. And pension plans could emphasize old-fashioned "value investing" featuring clear commitments to comprehensible business plans.⁷⁰

Although some die-hard laissez-faire advocates vilify socially responsible investing as a form of European socialism, proposals like these have deep roots in American soil. Financial reform planners early in Franklin Roosevelt's administration envisioned agencies intended to "direct the flow of new investment in private industry" toward socially useful projects, and away from the kind of self-dealing common in the Roaring Twenties (and the more recent housing bubble).⁷¹ Rexford Tugwell wanted a commission to "encourage or discourage the flow of capital into various industries."⁷² Considering the shameful state of America's roads, bridges, and public transit today, would it be too much to ask the Fed to purchase "infrastructure bonds" to complement its vast holdings of mortgage-backed securities?⁷³ FDR's advisers also took a direct approach to financial stability; the corporate governance expert Adolf Berle advocated for an agency to "exercise a real control over undue expansion of groups of credit instruments."⁷⁴ His proposal is as timely now as it was then.⁷⁵

The dynamic of circularity teaches us that there is no stable, static equilibrium to be achieved between regulators and regulated. The government is either pushing industry to realize some public values in its activities (say, by respecting privacy or investing in sustainable growth), or industry is pushing its regulators to promote its own interests.⁷⁶ Many of the black box dynamics we saw unleashed in finance arose out of failed efforts to fudge this tension—such as the credit agencies' role as a "soft" regulator, or the government's wink-wink, nod-nod (non)assurances regarding its backing of Fannie and Freddie and massive financial institutions.⁷⁷ That pattern continues to this day: the authors of Dodd-Frank say their bill solved the "too big to fail" problem, but Richard Fisher, president of the Federal Reserve Bank of Dallas, says it is all but inevitable government will bail out a massive financial firm if too many of its bets go

bad.⁷⁸ Credit ratings reflect the same assumption: megabanks' risks are too complex to quantify, but the smart money assumes government will step in the moment they are in danger.

Finance experts have obsessed over matters of *structure* after the crisis: for example, how can we assure that banks are smaller, less interconnected, and better capitalized, to reduce the risk (and consequences) of failure. But questions of *substance* are far more important to building a resilient society. For example, where *should* the capital improperly invested in the MBS/CDO/CDS hall of mirrors have been allocated? Mariana Mazzucato, Geoff Mulgan, Joseph Stiglitz, and Robert Kuttner have all provided compelling answers, ranging from infrastructure and antibiotics to basic research and education. We need to heed their work. Without clear substantive answers to the question concerning finance, all we can reliably expect in the future is that capital will be allocated to whatever instruments lead to the highest fees for self-serving intermediaries.⁷⁹

"Leaving it to the finance experts" is a recipe for decline, because the success of the finance industry bears no inevitable relationship to the long-term health of the economy. Finance can be extractive or uplifting, narrowly short-termist or focused on the infrastructural and investment needs of society as a whole. To address those needs consistently, we need a government interested in forward-thinking industrial policy, and willing to enforce its interest.⁸⁰ This attitude is currently in short supply in Washington. But the government has used its hold on the purse strings to good effect before, and it could do it again. The Chinese investment in infrastructure, education, rare earths, and green technology should be a Sputnik moment for America. It is time to commit more of our resources to enterprises likely to bear real and equitably distributed returns.⁸¹

Again, while these proposals will sound excessively statist to bien-pensant economists, consider the alternatives. Our law enforcement apparatus has manifestly failed to deter or properly punish illegal behavior in the finance sector. The previous chapter described what it would take to fully police information advantage in the industry—as with Terry Fisher's proposal for Internet content, mass surveillance is necessary. I borrowed this model from health care, where a swarm of contractors scrutinizes billing records to detect fraud and

abuse. But another health care model, designed to prevent overbilling and overtreatment, is simply to pay physicians salaries, rather than “per-procedure.” Imagine if this approach were to supersede the bonus culture of Wall Street (where, for most key players, annual pay is peanuts compared to the bounty available in a banner year of spectacularly successful risks). Sure, in health care, there are worries that salary-based pay will lead to shirking. But given how destructive financial innovation has been over the past decade, maybe bankers *ought* to work less, at least until they can better prove how their sector contributes to real productivity.⁸²

Restoring Trust

For too long, we have assumed that the core aim of financial regulation is disclosure.⁸³ When every consumer understands the consequences of his actions, we like to believe, and when every investor has the same key data about a security as its seller, the financial playing field will finally be leveled. And in some cases, sunlight truly is the “best disinfectant.”⁸⁴ But not always. “Truth” is all too apt to be told slant. And when that happens too many times, trust is unwarranted.

Lately trust issues have begun to haunt not only finance but also the leading reputation and search providers. The “rocket scientists” once adored by the precrisis media have lost some of their luster.⁸⁵ Silicon Valley giants are looking less like romantic heroes and more like “Wall Street West”—in-groups driven by lust for the quick payday. As for the finance sector itself, it is still rife with outright scandal, the most notable being the Libor-rigging debacle of 2012. Taken individually, its problems can be explained away as the work of a few bad apples; together, they suggest widespread rot. The temptation for bankers and for Silicon Valley executives alike is that even tiny manipulations of huge volumes of transactions generate easy money. The culture of speed, scale, and speculation can trample openness and honesty.

As former prosecutor Neil Barofsky summed it up in his memoir *Bailout*, “The incentives are to cheat, and cheating is profitable because there are no consequences.”⁸⁶ Even a \$450 million fine is about as annoying as a mosquito bite to (those in charge of) a bank with

more than \$50 billion in revenue.⁸⁷ Penalties in Silicon Valley are an order of magnitude more trivial. Although \$22.5 million is only about four hours of revenue for Google, the FTC touted it as a record-setting fine. Facebook settled one case for \$10 million.⁸⁸ The FCC once “punished” Google with a \$25,000 fine. It is a broken enforcement model, and we have black boxes to thank for much of this. People can’t be outraged at what they can’t understand. And without some public concern about the trivial level of penalties for lawbreaking here, there are no consequences for the politicians ultimately responsible for them.

The Limits of Black Boxes: A Hayekian Perspective

Admittedly, black boxes smooth things; they make ordinary transactions faster and more efficient. The reforms I propose would slow things down. They would incur expenses, which would likely get passed on to us. They would cost time, too. It takes an automatic algorithm milliseconds to act on a copyright complaint; it would take longer than that for people to appraise a website’s claim of fair use. Credit raters would have to expend human time and judgment to spot the times when negative credit information is less credible than the person it’s putting down.

I have no doubt that think tanks will offer ominous prognostications about the costs of such initiatives. (Whether they’ll be as forthcoming with the identity of their sponsors remains to be seen.)⁸⁹ It’s easy to forecast the loss of tens of thousands of jobs if financial transactions are taxed, or if credit bureaus are required to give a full and fair accounting of their actions. Wall Street firms have repeatedly purchased such studies and promoted them in lobbying campaigns. But, as law professor John C. Coates has shown, cost benefit analysis of regulation can be yet another misapplication of natural science methods to social scientific prediction.⁹⁰ Despite industry’s predictions of doom, it is just as plausible that accountability in the reputation, search, and finance sectors would *create* jobs rather than destroy them. Accountability requires human judgment, and only humans can perform the critical function of making sure that, as our social relations become ever more automated, domination and discrimination aren’t built invisibly into their code.

Another overefficiency of black boxes concerns the fact that information does not always lend itself to generalization. For example, Amar Bhidé, a professor at Tufts University with experience in finance and consulting, harshly criticizes the homogenizing impact of nationwide underwriting standards on local housing markets. He criticizes black boxes from a Hayekian perspective, exposing our giant finance firms for having faults eerily reminiscent of Communist central planners.⁹¹

Hayek's fundamental insight was that nobody knows everything about how goods and services in an economy should be priced, and that no one central decision maker can ever really grasp the idiosyncratic preferences, values, and purchasing power of millions of individuals.⁹² That kind of knowledge, Hayek said, is *distributed*.

Today, Hayek's most vocal supporters tend to assume that he was only criticizing the state. But the finance sector is plenty concentrated, and interconnected with state power. Bhidé says that its centralization, too, is concerning, and should give way to more localized decision making. A loan officer in Phoenix, for example, would be far more likely to recognize dodgy local mortgage applicants than a high-level manager several hundred miles away. Moreover, a local bank putting its own money on the line (originating loans to keep them) would have a strong incentive to estimate clearly the potential risks and rewards of its decisions.⁹³

A Hayekian critic of black box firms could take this line of reasoning even further. Why should so much of the Internet be organized by a single company, Google? Isn't its fast pace of acquiring start-ups a Promethean ambition to centralize more and more computing talent into a single firm? The same could be said with respect to Apple's tight grip over its app empire, or even the dominant provision of social networking by Facebook.⁹⁴ A committed Hayekian could easily make the case for far more aggressive antitrust enforcement in tech industries.⁹⁵

Black Box Endgame

In their common goals, procedures, and (increasingly) cultures, powerful alliances have developed among the reputation, search, and finance sectors. The first two deal in data, while the securities

of Wall Street, ostensibly at least, appear more concrete. But the differences, while real, are less fundamental than the similarities. Ultimately, they are all in the business of information. What is money (and all its derivative forms) other than *information* about how much of our collective goods and services its owner can demand? And what are reputation and search firms establishing other than new *currencies* for allocating opportunity and attention? All these firms try to process information to score quick gains. But we should never lose sight of the fact that the numbers on their computer terminals have real effects, deciding who gets funded and found, and who is left discredited or obscure.

All rely on secrecy to protect the information on which the quick scores depend. This book could have been about many different forms of secrecy, however. Why focus on Silicon Valley and Wall Street in particular? Leading Internet and finance firms present a formidable threat to important values of privacy, dignity, and fairness. This threat, now increasingly intertwined with the power of the government, is too often obscured by self-protective black box practices and irrelevant distractions. The American political debate for the last several decades has calcified into struggles over “market forces” or “state provision.” Meanwhile the agile impresarios behind reputation, search, and finance firms exploit (and create) problems that neither state nor market alone can solve.

For them, the tug-of-war between market and state has become a *pas de deux*, and the blurring of this traditional distinction lies at the core of the black box society. The “markets” described in much of this book are markets for information—about how likely someone is to click on an ad; incur medical bills; pay off a loan. Information of this kind is valuable only if it is exclusive, *and it remains exclusive only if the full power of the state can be brought to bear on anyone who discloses it without authorization.*

In 1956, the sociologist C. Wright Mills sketched the American “power elite” of that time: the corporations, the military, and the government. Mills saw these entities in rough equipoise in their Cold War setting, each with its own independent base of power (that is, the capacity to force others to do what they would not be inclined to do otherwise). Mills’s division has been more and less relevant over

the course of the twentieth century; after the fall of the Berlin Wall, for instance, the military's domestic power waned, while 9/11 brought with it the resurgence of a defense/intelligence/policing complex. But his concept continues to capture attention and interest.⁹⁶

Some social theorists have adjusted Mills's typology to take into account the rise of other important actors, such as the media. But if Mills's "triangle of power" needs updating, its quaintness derives less from the failure to include other power centers than from the separate-but-equal status that Mills attributed to its members. Twenty-first-century revolving-door dynamics present a constant temptation for public servants to "cash out" for private-sector pay-days, leaving them loath to do anything that might disrupt either their own main chance or similar opportunities for their peers and protégés.

If we are to retrieve our political process from its outmoded and self-serving rut, we must recognize the new landscape. That requires studying the "ideal role of the state in the economic and social organization of a country" directly, rather than presuming it should merely get out of the way of markets.⁹⁷ This is the task of the classic social science of political economy, a method that integrates long-divided fields. Armed with that knowledge, we can take up once more the vital debate that has been so long derailed: What kind of a society do we really want?

Toward an Intelligible Society

Capitalist democracies increasingly use automated processes to assess risk and allocate opportunity. The companies that control these processes are some of the most dynamic, profitable, and important parts of the information economy. All of these services make use of algorithms, usually secret, to bring some order to vast amounts of information. The allure of the technology is clear—the ancient aspiration to predict the future, tempered with a modern twist of statistical sobriety.

Yet in a climate of secrecy, bad information is as likely to endure as good, and to result in unfair and even disastrous predictions. This is why the wholesale use of black box modeling, however prof-

itable it is for the insiders who manage it, is dangerous to society as a whole. It's bad enough when innocent individuals are hurt, branded as security threats or goldbrickers or credit risks by inaccuracies that they can't contest and may not even know about. Modeling is even worse when unfair or inappropriate considerations combine with the power of algorithms to create the failures they claim to merely predict.

Moreover, when the errors are systematic enough, algorithmic control fails on its own terms. That happened most spectacularly in the crisis of 2008. Order was restored only by the infusion of hundreds of billions of dollars of government money, and even in this mammoth intervention secrecy prevailed; the identity of many of the banks involved was kept under wraps at the time.

Educated citizenship today requires more than an understanding of government, which is just the tip of an iceberg of social organization. It also demands an understanding of the companies that influence our government and culture. The firms that order the Internet and direct the flow of capital have outsized influence in Washington. For better or worse, they also increasingly determine the value and visibility of labor, companies, and investments. But they do all this in the shadows. Public options in search and finance need to be developed to create spaces not only for transparency, but for intelligibility as well. Failing that, we can count on a society ever more skewed to the advantage of black box insiders, and a populace ever more ignorant of how its key institutions actually function.

Few of us understand how our car engines work, but we can judge well enough whether they get us to our destinations safely and comfortably. We cannot so easily assess how well the engines of reputation, search, and finance do their jobs. Trade secrecy, where it prevails, makes it practically impossible to test whether their judgments are valid, honest, or fair. The designation of a person as a bad employment prospect, or a website as irrelevant, or a loan as a bad risk may be motivated by illicit aims, but in most cases we'll never be privy to the information needed to prove that. What we do know is that those at the top of the heap will succeed further, thanks in large part to the reputation incurred by past success; those at the bottom are likely to endure cascading disadvantages. Despite the

promises of freedom and self-determination held out by the lords of the information age, black box methods are just as likely to entrench a digital aristocracy as to empower experts.

Open uses of technology hold a very different kind of promise. Instead of using surveillance technology against American citizens, the government could deploy it on our behalf, to monitor and contain corporate greed and waste. Public options in technology and finance would make our social world both fairer and more comprehensible. Rather than contort ourselves to fit “an impersonal economy lacking a truly human purpose,” we might ask how institutions could be reshaped to meet higher ends than shareholder value.⁹⁸ Admittedly, demands for dignity, due process, and social justice are controversial; there will always be holders of vested privilege who prefer not to share. Nevertheless, it is time for us as citizens to demand that important decisions about our financial and communication infrastructures be made intelligible, soon, to independent reviewers—and that, over the years and the decades to come, they be made part of a public record available to us all.

Black box services are often wondrous to behold, but our black box society has become dangerously unstable, unfair, and unproductive. Neither New York quants nor California engineers can deliver a sound economy or a secure society. Those are the tasks of a citizenry, which can perform its job only as well as it understands the stakes.