Book Reviews

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The Black Box Society: The Secret Algorithms That Control Money and Information
by Frank Pasquale
Cambridge, MA: Harvard University Press, 2015, 320 pp.
€ 31.50

*Sofia Ranchordás**

The book *The Black Box Society* starts with an aphorism known to most of us: "knowledge is power" but knowledge is also often "a one-way mirror" and a source of power imbalance. In the digital age, our lives have become increasingly more exposed to the outside world as we share daily news of our workout routine, eating habits, and professional successes and failures on social media. However, while banks and large companies use this data to assess our credit scores, discriminate prices, and determine whether we should be invited for a job interview or not, the lives of these companies remain just as opaque as they were before the emergence of the Internet. Secrecy and transparency are also one-way mirrors. In *The Black Box Society*, Frank Pasquale offers us a systematic analysis of these problems, distinguishing between different types of secrecy (real secrecy, legal secrecy, and obfuscation), explaining how technology has contributed to the growing complexity and opacity of some sectors, and warning readers against the uncontrolled collection of personal data for undesired ends. Pasquale explains how secrecy on the side of companies, has become a powerful business which reduces itself to the sale of individuals' openly available information. Pasquale underlines the risks of this secrecy business in the financial sector, where banks have profited from the ignorance of their investors who were not aware of the value of the products they were buying. In this book, Pasquale clarifies how the Internet, instead of being the "promised land of transparency" and open access to information, has become a powerful instrument of obfuscation.

The book is divided in six chapters: after a brief roadmap in chapter 1, chapter 2 introduces the reader to the problem of massive data collection and data breaches in different sectors; in chapter 3, Pasquale explains "the hidden logics of Internet search;" chapter 4 examines the financial sector and how algorithms have been used to make this sector less transparent to investors; in chapters 5 and 6, the book reminds us that regulators might not need to "reinvent the wheel" in order to regulate "black boxes". Rather, regulators should be able to address algorithmic complexities and uncontrolled data collection used to develop credit scores by applying already existing regulatory instruments and legislation that aims to render corporations more accountable and more protective of individuals' privacy.

Black Boxes

The term black box is employed by scientists and engineers in different fields. It is a multifaceted metaphor that generally refers to an opaque system of inputs and outputs. The "black box" is a process or phenomenon such that scientists know what goes in and what comes out, but are ignorant of what happens in between. In the context of sociology of science, Bruno LaTour, whose work appears to have influenced Pasquale, defines "black boxing" as "the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one focuses only on its inputs and outputs and not on its internal complexity."[1] Frank Pasquale appears to be interested in understanding the internal complexity of some of these black boxes.

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1 Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999) 303.

In this interesting and groundbreaking monograph, Pasquale delves into two central categories of "black boxes": those employed by the finance sector to develop credit scores and ratings (Wall Street) and those used by the high-tech sector to gather personal information about users (Silicon Valley). In both cases, large corporations work with complex algorithms and data brokers to collect and process as much data as possible about consumers in an alleged attempt to work more efficiently, provide targeted advertisement, and offer the lowest prices. However, the use of "black boxes" or, in most cases, complex and secret algorithms, has become a source of increasing concern as little is known about how they work and on what data they rely. The *Black Box Society* discusses thus the fundamental information asymmetry that we now witness: while many companies are fully aware of our lives ("open books"), our knowledge of how the "black box" remains as opaque as before: "Everything we do is recorded, the only questions are by whom, until when, and who has access to it."

Runaway Data

In chapter 2, Pasquale describes how our data is gathered and sold by data brokers. He compares this process to a "runaway train". The gathering of data and the consequent profiling of users occur in mysterious ways. Internet-users are often unaware that this process is taking place and how. The collection and processing of data is used for example by large employers to profile the efficiency of both existing and potential employees and for targeted advertising. However, as Pasquale describes, this uncontrolled data collection may also serve other pernicious effects. Chapter 2 discusses not only how credit bureaus gather data and use algorithms to determine individuals' credit scores but also how difficult it might be for consumers to contest these scores based on the secret gathering of data.

Data collection and processing is also relevant in the medical context. Before the enactment of the Affordable Care Act in the United States, insurance companies could allegedly discriminate potential clients based on available information on preexisting conditions. However, the Affordable Care Act still allows insurance companies to offer discounts for consumers participating in wellness programs. Large retailers also collect data based on our purchases and attempt to target advertising based on assumptions made by the processing of this data. This occurs both in Europe and the United States, even though the monograph only focuses on the latter. As the book underlines, the risks of data breaches are extremely high and the effects potentially pernicious, as data-based profiles are quite complete, often health-related but they are not protected as private health information.

Black Boxes in the Financial Sector

"Black boxes" in different sectors leave citizens exposed to big data companies, but large firms protected from any accountability claims as they can easily hide behind the secrecy and complexity of mathematical formulas. Chapter 4 develops this claim by exploring how black boxes are used in the financial sector. The study of finance evidences the delicate balance between transparency and secrecy. The financial sector uses multiple black boxes, including rating formulas, which often leave investors in the dark. In addition, the sector relies on complex processing systems which might be hacked into and tampered with. Pasquale argues that contemporary finance is premised on this opacity of information or, in other words, it might rely upon the use of mechanisms to hide information from borrowers, lenders, clients, regulators, and the public. Algorithmic methods—supposedly by reducing a given judgment or process to a series of steps—were regarded as potential forms of leveling the playing field and reducing risk. However, automation has expanded the sector's capacity to augment the scope of the "black box" in the financial sector and "bluff those who are supposed to manage risk and detect deception." In this sector, companies insure against risks and processes they cannot fully understand, instead of trying to improve internal processes they cannot fully understand.

Reputation

An interesting part of the book delves into the benefits and perils of the reputational mechanisms enabled by the internet and the collection of personal data. Good or bad reputation is translated not only

into digital peer-reviews (for example on Yelp) but also on credit scores and ratings. In the digital age, the success of individuals is determined by how companies synthetize complex data into reputation. Reputation is often shaped not by human decisions but rather by secret algorithms. This is visible, for example, in how platforms highlight some news in detriment of others, showing us media articles especially selected for us. Digital platforms such as Facebook, Twitter, and Amazon list and rank searches and products, hence determining their success or failure. However, as Pasquale rightly points out, reputation originating from black boxes cannot be easily controlled. Corporations might decide on our reputation based on secret information, our consumption patterns, or even our names, if they are typically associated with a certain minority. Moreover, contrary to the real world, we cannot always "work hard" to improve our reputation. Rather, the decisions on reputation cannot be easily refreshed or deleted, tending to stay forever on the Internet. As Frank Pasquale concludes "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." However, the automated mechanisms that are replacing human judgment and good sense inside the black box might often be biased.

Regulation

While the book sheds new light on the problem of asymmetric data collection and makes a very important contribution to the literature by exploring the practice of "blackboxing" in the financial sector, readers interested in regulation might miss some specific normative suggestions in chapters 5 and 6. The problem of transparency or knowledge imbalance defined in chapter 1 also appears to become unfortunately diluted in the general narrative at the end of the book. While companies will not stop gathering data, it is important to think about how to limit the risks of asymmetric data collection as well as the use of "secret algorithms" which operate in mysterious ways. Enhancing transparency in the financial sector and more broadly, in any digital area, is essential but how do we move from words to regulatory action? While Pasquale relies on existing approaches to deal with these problems, he suggests some steps which include the need to implement the concept of "qualified transparency" which means that people should be allowed to know what information is being gathered about them but this should not involve the disclosure of trade secrets. Pasquale, also a well-versed Privacy scholar, offers interesting suggestions in this area, arguing that personal information gathered by data-driven companies should also be protected in some cases under a regime similar to that of health privacy data. Also, Pasquale wonders whether some lists such as "gullible elderly" should even exist since they can be primarily used for fraudulent purposes.

"Black boxes embody paradoxes of the 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." This book deserves the attention of the law and technology and risk regulation literature. It reflects upon the risks of using complex and opaque models that individuals do not understand, replacing human judgment by automation, giving more weight to decisions resulting from these black boxes than from transparent procedures. However, this book also raises deeper questions on the role of agencies, the delegation to experts, power imbalances between individuals on the Internet, and the replacement of regulation by reputational mechanisms that should have further elaborated in chapters 5 and 6.

Although most European citizens might not be aware of the existence and functioning of these "black boxes" and might find some parts of the narrative far-fetched, this topic and in particular the employment of algorithms to shield financial risks and human error is closer to us than we think. In popular culture, this topic was recently discussed in the 2016 thriller "Money Monster". Both this film and the book invite citizens not to accept the output of these "black boxes" for granted, regardless of how efficient and attractive they might appear to be. Interestingly, the legal academia—here personified by Frank Pasquale—and cinema appear to pronounce the same message in unison: citizens should become more engaged and demand enhanced transparency from corporations that rely on these black boxes. The book *Black Box Society* certainly gives a solid step in this direction with its innovative and thought-provoking approach to big data, secret algorithms, and power imbalances in the digital age.