Marielle Debos
Professor of Political Science
University of Paris Nanterre
Institute for Social sciences of Politics
debos@parisnanterre.fr

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This paper is an early draft of the introduction to a forthcoming book entitled *The Biometric Promise: Technology, Market, and Elections in Africa*.
The book has been submitted to Cambridge University Press.
I am currently working on the revisions of the book.
Do not circulate this draft. It is intended for the WISER seminar only.

The Biometric Promise: Technology, Market, and Elections in Africa

Introduction

Scanning the irises in people's eyes so that they can be registered on voters' lists, having fingerprint readers in polling stations, using a facial analysis algorithm to identify alleged minors and exclude them from the voter lists… These scenes are not taken from fiction: they have actually happened in Somaliland, Kenya, and the Democratic Republic of Congo (DRC). In less than two decades, biometrics has become a new norm in electoral processes in Africa. How has this technology – which considers a person in their biological dimension and consists of measuring parts of the body – become associated with democracy? How has the geometry of fingerprints, faces and irises come to be seen as the instrument of democracy and modernity? How and why, at a particular moment in history, did biometrics emerge as an obvious solution to supposed failures of states and elections in Africa? The fact that biometric voting has developed in the postcolonial world, and particularly in Africa, is of more than superficial interest. The idea of a continent transformed by science and

technology has a colonial and postcolonial history, and biometric voting should be placed within this trajectory.

Biometric voting is a radical form of a well-known phenomenon: technological solutionism (Rosner 2004, Morozov 2013) – the application of technological solutions to structural problems. In the realm of politics, this refers to the promise that there is a technology that can solve political problems and sometimes even save democracy and the state. What is exactly the promise held out by biometrics? The promise, first, of a technological barrier that can be erected against human corruption and of a fraud-free election, whose success and integrity are measurable. The promise, second, of a pacification tool for a strife-free electoral democracy. The promise, finally, of an Africa projected into a technological future.

The promise is inseparable from its double: disappointment – even betrayal. The objective of this book is to grasp what is at stake in the tight knot formed by promises and disappointments. The promise serves as an entry point for thinking about the tensions between the aspiration of gaining access to rights and the obstacles to their exercise, between dreams of technological progress and artisanal tinkering, between hopes for a re-enchantment of politics and the closing down of democratic spaces. Like all great modernizing projects, biometric identification systems are promises made in the present about the future. Often incomplete, unfinished or failed, they appear as the 'ruins of the future' (Gupta 2018: 66-79). The biometric kits housed in warehouses that have been rendered unusable by time and dust symbolize these ruined promises. Biometrics challenges the narrative of a continent that is 'backward', 'in crisis' or has 'got off to a false start.' It also challenges the counter-narrative of Africa as a prefiguration of the future of the world. We are neither in Conrad's 'heart of darkness' (Conrad 1899) nor in the Wakanda[1] of the Marvel universe.

Who made this promise? A range of actors from different backgrounds, with different interests, ethics and conceptions of democracy. They are engineers, technicians, businesspeople and electoral experts, as well as political actors and voters. This book explores the configurations of the market, technology and politics that have shaped the success of biometric voting. It shows that biometric voting brings together liberal political thought (elections as a proxy for democracy), neoliberalism (redefining the relationship between the state and private actors in favour of the

[1] The imaginary country in which the superhero Black Panther is born in the Marvel series.

latter), and technosolutionism (the belief that technology can solve any social or political problem). The story of biometric voting is an intriguing one. This technological 'solution' has flourished against all odds. Despite its exorbitant cost, resounding technological failures and limited impact on the quality of elections (in the best-case scenario), it has imposed itself as a standard. Another curious aspect of the story is that biometrics has continued to thrive even as international donors and experts have distanced themselves from the technology that they initially championed. This book investigates this unresolved puzzle, and shows what 'works' (socially and politically) when a technology does not work.

Below, I map the empirical and theoretical questions which animate this book. The first section introduces the role of biometric voting within the broader biometrics revolution, examining its position in the debates on identification policies and technologies. I then intervene in debates regarding colonial legacies, global power dynamics, and African actors' agency. In the third section, I explain how I approach the political economy of the biometric voting market, studying how commercial interests are embedded in political logics and social relations. The fourth section explores the material and technological dimensions of manufacturing democracy. The final section is devoted to fieldwork and methodology.

How Biometrics Became a Democratization Tool

Biometric voting was introduced in Africa in the mid-2000s as a solution to political crises in countries affected by armed conflict or electoral violence. It was soon adopted by many other countries across the continent. Over twenty or so years, more than half the countries in Africa have integrated biometrics into their electoral processes. Of the 55 African Union countries, 35 have already used biometrics to identify voters on at least one occasion; to these, we should add the self-declared state of Somaliland. This list includes countries with a long history of wars and fraudulent elections, such as the Democratic Republic of Congo (DRC) or Chad, countries with a history of (post)-electoral violence such as Nigeria and Kenya, as well as countries considered as established democracies such as Senegal or Ghana. Concretely, biometric voting refers to three distinct uses. First, biometric voter registration (BVR). With BVR, each voter is identified by their fingerprints and/or face using kits – consisting of a peripheral biometric capture device, a laptop

or tablet and often an electric generator. Data deduplication makes it possible to identify people who have been registered several times on the lists and to remove the duplicates from the database. Second, biometric voter verification (BVV) refers to the use of biometric kits on polling day to verify the identity of the person coming to vote. Six countries (Ghana, Ivory Coast, Kenya, Namibia, Nigeria and Uganda) have adopted BVV. This technology prevents identity fraud and stops people from voting more than once – if everything works as expected, which is far from the norm – but is ineffective against all other frauds. The most recent – and most disturbing – development in this field is the use of facial analysis to detect underage voters. Two countries (DRC and Guinea) have used this technology.

The surge in biometric voting is part of a larger boom in biometric identification systems. The craze for biometrics is fuelled by the contemporary obsession with measurement, quantification and verification (Maguire, Rao and Zurawski 2018). Its success also lies in the belief that the truth of bodies is superior to the truth of narratives. Documentary identification is based on a person's biography, including their name, their parents' names, and their date and place of birth. This establishes a connection to a collective history, be it as someone's son or daughter, or as a resident of a village or city. By contrast, the promise of biometrics is that it is possible to identify a person without knowing anything about their history or social ties. People are no longer identified by their names and histories, but by their fingerprints, irises, or faces. It involves a shift from stories to samples (Lyon 2009): the physical body is detached from the social body. The body itself becomes information (Van der Ploeg 2008: 57–73). Because of these characteristics, biometrics has been framed as a neutral and objective tool for identifying individuals and combatting fraud.

While biometrics has long been used for law enforcement, over the last two decades, major global policies have boosted the biometric identification market. First, in the context of the 'war on terror' that started after the 2001 terror attacks, governments deployed technologies of identification for security and surveillance purposes (e.g. Epstein 2007; Bigo and Tsoukala 2008; Gates 2011). Second, the intensification of anti-migration policies and the securitization of migrations – the framing of migration as a security issue – have further facilitated the deployment of biometric and digital identification systems (e.g. Bourbeau 2011; Jeandesboz 2016; Frowd 2018). Biometrics has become the norm for passports and border controls. The Covid-19 epidemic is the most recent factor in the development of digital and biometric identification systems (Masiero 2020; Milan,

Treré and Masiero 2021). Both government and commercial actors seized the opportunity of the global pandemic to accelerate the deployment of biometric and digital identification systems. These systems have been used to identify and trace the sick but also, particularly in the Global South, to distribute aid. As we are increasingly 'governed by identity' (Amoore 2008), biometrics has become ubiquitous.

The same companies are selling the technology used to identify for example refugees at Europe's borders, social grant recipients in India, and voters in most African countries. In all these contexts, there is a belief in the truth of the body and an obsession with tracking down fraudsters. Biometrics is used to manage the 'undesirable' (Agier 2011) refugees, as well as to hunt down the ghosts who, it is feared, corrupt the lists of beneficiaries or voters. However, depending on where and by whom it is used, the technology will raise different political and ethical questions. Of course, a European citizen showing her passport to board a plane and a Sudanese in a refugee camp in neighbouring Chad have little in common. Although both have parts of their bodies measured and turned into mathematical abstractions, their biometric IDs do not grant the same rights, and the risks posed by the databases are different.

Biometric identification systems have been deployed not only in the name of security or migration surveillance, but also in the name of development, human rights, women's empowerment and democracy. In this context, these systems came to be seen as a kind of 'technology for good.' The development of biometric voting in Africa coincides with a larger 'biometrics revolution' across the Global South (Gelb and Clark 2013). The technological shift within the humanitarian sector has raised concerns over the power imbalances between technology firms, aid organizations, and the beneficiaries of aid (Martin, Sharma, et al. 2023). In this sector, biometric technologies were introduced in 2002 by the UNHCR to register Afghan refugees in Pakistan (Madianou 2024: 64). Since then, humanitarian actors have normalized and extended the use of biometrics to a wide range of practices, including cash distribution. A decade later, legal identity became a new 'cause' in the overall international development market. One of the key targets of the Sustainable Development Goals (SDG) adopted by the United Nations in 2015 is to 'provide legal identity for all' by 2030. Around the same time, the World Bank launched its Identity for Development (ID4D) program. Biometrics has become now the norm across the Global South for the identification of citizens and refugees, tax collection, and the delivery of humanitarian aid and social grants. A wide

range of public institutions and private actors (most notably banks) rely on biometrics to identify their citizens and clients.

The boom in identification technologies has sparked important debates. A first theoretical debate concerns the multiple ways in which identification techniques affect the state's architecture of power (Breckenridge 2014; Awenengo Dalberto and Banégas 2021; Banégas and Cutolo 2024). Discussions have explored the potentials of biometric and digital identification systems for development, rights and inclusion (e.g. Gelb and Clark 2013) as well as the risks of harm (Manby 2020, Manby 2021). Highlighting the ambivalent effects of these identity systems, scholars have explained why surveillance and the recognition of rights are mutually compatible developments (Weitzberg, Cheesman, et al., 2021). Scholars working through a data justice lens (Taylor 2017; Denick, Hintz et al. 2019) have explored the inclusion and exclusion effects of digital identity systems, emphasizing the forms of injustice experienced in the lived realities of individuals enrolled in such programs (Martin and Taylor 2020; Masiero 2024). The use of biometrics in humanitarian responses to refugee crises has been the most controversial, triggering debates about surveillance, coercion and the risks for vulnerable individuals and communities (e.g. Cheesman 2020; Sandvik 2023). While it facilitates operations such as the distribution of aid, technology also reinforces control over migrants and can endanger the beneficiaries. Voter rolls are arguably not as sensitive as databases used to identify refugees. The databases created for each election cycle are often of too poor quality to be efficiently used for surveillance purposes. However, the spread of biometric voting is part of this story. In many African countries, biometric registration campaigns have been the first step in the creation of larger biometric and digital identification systems. The use of the technology in elections has associated it with a democratic horizon, participating in its normalization. This book asks how a technology with a troubled history came to be seen as a democratization tool.

Technology in the Postcolony: Colonial Legacies and Innovation

The deployment of biometric voting should be placed in a broader theoretical debate about technology in the Global South. Science and Technology Studies (STS) turned their attention to the Global South about thirty years ago (see for example the anthology edited by Sandra Harding

in 2011). At the same time, Afrofuturism radically challenged the conventional perception of Africa and Blackness as inherently devoid of technology and innovation (Nelson 2002). However, part of the academic field nevertheless continues to work as if the Euro-Atlantic space had remained the technological center of the world. Despite its seven hundred pages, one of the most discussed books today, *The Age of Surveillance Capitalism* (Zuboff 2019), on the new power of a small group of tech firms (Google, Facebook and a few others), says nothing about Africa (Breckenridge 2020). However, what is happening on the continent is crucial to understanding the contemporary evolution of technology, capitalism, and surveillance. Take the example of illegal social media surveillance. Cambridge Analytica, a British firm specializing in large-scale data analysis, used personal data, in particular information from Facebook accounts, to create personality profiles of voters and develop campaign strategies. The data, that they had illegally accessed, allowed them to identify the segments of the population that would be most influential if mobilized, and to monitor social media users so that they could be micro-targeted. The revelation that they had interfered in the 2016 US presidential election, and influenced the UK's Brexit referendum that same year, was met with outrage and subsequently led to the end of the firm. Less well known is that the same firm was involved in Kenya, South Africa, and Nigeria before the scandal broke out. The political campaign for the 2013 general election in Kenya may well have been 'the testing ground for at least some of the methodology later used in the Brexit and Trump campaigns' (Nyabola 2018: 161).

In the eyes of biometrics companies, Africa is the 'ultimate frontier' – a partially untapped market yet to be fully conquered. With a few exceptions, they do not see Africa as a laboratory in the most literal sense: they do not need to test their products there. Most biometric technologies sold on the continent are very common and already in extensive use across the globe. However, corporate actors see the continent as a formidable playground. According to a businessman from one of the leading French companies, it is an 'immature area with projects that are taking off.'[2] Such orientalist narratives are pervasive in this field, and Africa is seen both as a continent of crises and opportunities – the two being the two sides of the same coin (Roy 2010: 20). This does not imply, however, that African actors are the passive recipients of a technology designed outside the continent. If Africa is a laboratory, it is in the sense of Helen Tilley's 'living laboratory' (Tilley

[2] Interview with a businessman from a French company, Abuja, April 2018, translated from French.

2011). In her investigation of science in the British Empire, she shows that Africans have been active agents in the production, application and reappropriation of scientific knowledge.

Adopting a critical stance on the Africa-as-laboratory trope, this book asks: do technologies reinforce, or on the contrary subvert, postcolonial logics of domination? Are African countries using biometrics for their elections following global prescriptions formulated outside the continent? Or, are they challenging the stereotypical opposition between the 'high tech' Global North and the 'low tech' Global South? The entanglement of postcolonial and neoliberal logics of surveillance is a key discussion in the literature on digital innovation in international aid. Mirca Madianou introduces the concept of 'technocolonialism' in order to 'analyze the convergence of digital developments with humanitarian structures and market forces and the extent to which they reinvigorate and rework colonial relationships of dependency' (Madianou 2009: 10; see also Madianou 2024). While I acknowledge the intermingling of business interests and postcolonial politics, I also ask: where exactly do global inequalities come into play? Where exactly is the postcolonial in the political economy of identification technologies? If we begin with the premise that the postcolonial is everywhere, we fail to acknowledge where postcolonial legacies are at work – and where they are not. Having established that history matters and that the relationship between the Global North and the African South is shaped by an imperial past, another question arises: 'which past and according to what articulation to the present?' (Dezalay, 2025: 10). As we shall see, colonial legacies have been particularly strong in the former French empire, until the recent anti-imperialist wave in West Africa. By contrast, Anglophone countries have never experienced such strong influence from former colonial powers. I also aim to specify what exactly it is that African state administrations are dependent on: is it the foreign expertise, the donors, or the corporate actors? The fact that technological standards have been developed by companies based in the Global North creates dependency, although this is increasingly being contested by their clients in Africa. What leverage do African actors have in negotiating and navigating unequal global power structures? Under what condition are they able to contest or circumvent the heavy constraints imposed by global inequalities?

Global South countries are not only as sites of extraction but also of production, innovation, and consumption (Quet, Koichi et al. 2025). As Clapperton Mavhunga (2017) asserts, we need to move beyond a narrow, ethnocentric vision of what constitutes an innovation and pay attention not just

to inbound things but also to the design of the purpose. We should consider 'Africans as intellectual agents whose perspectives constitute authoritative knowledge and whose actions constitute strategic deployments of endogenous and inbound things' (Mavhunga 2017: ix). For instance, Kenya invented M-Pesa and popularized the payment via mobile phone known as 'mobile money' (Breckenridge 2019, Donovan and Park 2022). This innovative solution allows people without access to a bank to pay, transfer and access money. These mobile platforms have spread across the continent. They are integrated into the informal economy and are now part of Africa's FinTech (financial technology) sector. While the boom in this sector raises concerns about privacy, exploitative practices and the exacerbation of inequalities, it is an African response to the absence of traditional banking in many localities. Technology is thus not (or not only) brought in from outside. Going back to elections, the repurposing of equipment (Perrot, Pommerolle and Willis 2016) is also a form of innovation, as when biometric voter cards are used as identity documents, or ballot boxes are recycled in granaries as containers for storing food.

African political elites too are wagering on new technologies. Biometric and digital infrastructures are being installed at the request of African governments. In these times of 'Africa Rising' celebration, technologies feature heavily in the policies promoted at both continental and national levels. In 2014, the African Union (AU) adopted the 'Science, Technology and Innovation Strategy for Africa 2024'. The development of digital ID is one of the objectives of the African Union's 'Digital Transformation Strategy for Africa (2020–2030)' (African Union 2020). In Kenya, the so-called 'Silicon Savannah' has become a symbol of 'made in Africa' technologies. Other countries investing in technology include regional economic powers such as South Africa and Nigeria, as well as countries considered to be 'failed states,' for example South Sudan. There, the adoption of the biometric passport was a way of reflecting another image, that of modernity (MARKÓ 2016). In this regard, the adoption of biometrics in the realm of elections is ambivalent. On the one hand, biometric voting is a 'technology of Othering' (Abdelnour and Saeed 2014) brought to Africa by international interveners in search for solutions to political crises. On the other, technology-enabled elections provide symbolic capital.

Recognizing the importance of African agency, I analyze the role played by both international and African actors in the construction of an ideal of biometric democracy. I also consider how local political actors have used the technology strategically according to their own interests and

conceptions of politics. To do so, I trace the social construction of the biometric voting market over the last two decades. This approach complicates the narrative of the imposition of a technological solution on African states by international actors and offers a more nuanced vision of colonial legacies. In the 2000s, international donors and 'democracy makers' (Guilhot 2005) were instrumental in introducing and pushing this election technology on the continent. However, the promoters of the technology and the meanings attached to it have changed radically since its early deployment. Within a decade, biometric voting had fallen into disfavor with the very experts that initially framed it as the solution and lost international donor support. They were not critical of the technology itself, but of voter registration campaigns and their cyclical repetition. Donors moved on to funding other digital and biometric identification systems. By then, African political elites had embraced biometric voting and were no longer following the prescriptions of democracy promoters. Ironically, this election technology has established itself as the new standard in Africa at the very same time that it has been the subject of intense criticism. In this book, I examine the non-linear history of biometric voting and explains how a technology unpopular with experts and donors continues to spread. I explore both the postcolonial dimension of the political economy of biometric voting and its limitations. On the one hand, the market is still very much in the hands of European companies. On the other, African actors are aware of their dependence on foreign corporate actors and critical of their commercial practices. As we shall see, in recent years, the dominance of a select group of European companies has become a highly contentious political issue and a site of struggle over postcolonial sovereignty.

Costly Elections, Priceless Democracy

Although there was already a market for electoral materials, such as ballot boxes and ballot papers, biometric voting left open an unprecedented place for the private sector (Debos and Desgranges 2023, Debos 2025). Corporate actors have become central in the production of the voters' list, and, with the development of tools such as electronic transmission of results, in the production of election results. The economization of politics seems to have taken a literal form. The surge in biometric voting is undeniably linked to financial incentives. While the biometric industry defends its commercial interests, the political actors and election commissions are motivated by the fresh

rent-seeking opportunities. Ironically, as we will see, a technology promoted as a solution to electoral fraud has created ample opportunity for corporate irregularities.

The association of technology with democratic ideals has direct financial consequences. The cost of elections in Africa has risen steadily over the past twenty years, reaching a point where they now cost much more than those in North America, Europe or India. The gap between the costs of running an election in sub-Saharan Africa or elsewhere in the world has risen from a pre-millennium ratio of 2.3 (per voter: USD 4.1 vs. USD 1.8) to a ratio of almost 4.5 (USD 11.3 vs. USD 2.9) in 2019 (Der Straaten Jaap 2019). Several factors account for this: weak or incomplete population registers that lead to high voter registration costs, relative high labour costs (higher in Africa than in Asia), as well as absence of economies of scale in many African countries with a small population for a vast territory. However, biometrics is one of the key factors behind the rising costs (Sawyer 2022). Depending on context, the cost of biometrics per voter ranges between USD 2 and USD 5. There are, however, exceptions. The 2011 election in Ivory Coast broke all records at a cost of USD 57.1 per voter – of USD 46 of which went on biometrics (Gelb and Diofasi 2019: 326). As a result of numerous delays to the project, the bill was astronomical. French company Sagem ended up demanding EUR 246 million from Côte d'Ivoire (Moussaoui 2018). As donors are now reluctant to fund one-off registration, the cost falls on African states who are now self-financing these systems.

However, the popularity of election technologies is not limited to financial interests. In this research, I examine the corporate interests as well as the diverse ideas, voices, and policies that have shaped this market. I propose a political economy of biometric voting which aims to 'understand the economy politically, in its own technical nature and mechanisms' (Hibou 2017: 15). In other words, I am interested in the way economic cogs mesh with social realities and power relations. We have known ever since Max Weber and Karl Marx that the market is not natural. Moreover, as Karl Polanyi has shown, the market society is a myth, and the idea of a self-adjusting market is a 'stark utopia' (Polanyi 2001 [1944]: 3). The biometric voting market was not born spontaneously from the meeting of supply and demand. It has been organized by social and political institutions; it has also been shaped by normative positions, political prescriptions as well as representations concerning what 'works' or not in Africa. In this research, I show that the market for biometric voting was able to develop in the 2000s because certain conditions were met:

companies in need of new outlets, donors ready to wager on technology as a solution to political crises, and domestic political elites who (whether they really believed in the potential of biometrics, or just used it strategically) became its frontline campaigners.

Concerned by excessive state spending, one Malian electoral expert told me: 'Democracy is priceless, but it comes at a cost.'[3] The rhetoric of democratic modernity carries weight and seems to eclipse other concerns. The book explores this tension between the democratic ideal which by definition has no price and a technology which does. The biometric promise meets pre-existing ideals, hopes and desires. Biometrics companies, democracy professionals and political actors belong to distinct fields and have their own rationality. Depending on the times and situations, these actors will invoke the laws of the market or political ideals. To distance themselves from political controversies, biometric companies explain, for example, that they are simply responding to customer requests and that they do not get involved in politics. The same companies, however, also speak of development, democracy and human rights in their marketing strategies, as they aim to build their credibility as moral actors. The political actors who make the decision to disburse astronomical amounts for each electoral cycle use the quest for democracy as the ultimate argument. In this sense, political ideals play a role in the formation of the market. Conversely, politics is not a field independent of the market.

Techno-Solutionism in Disenchanted Times

A frenzy of security measures has developed around elections in Africa. This drive to modernize democracy and securitize the voter rolls should be placed in its historical context. Way ahead of his time, in the 1970s, Senegalese President Léopold Sédar Senghor put forward the idea of using biometrics for voter registration. However, the technology was not yet ready, and the project never materialized. The push for electoral modernization actually began in the 1990s, following the wave of democratization sparked by street protests and strikes in Benin (Banégas 2003). While elected governments were the exception in the early 1990s, most countries on the continent had adopted the multiparty system by the end of the decade. Political leaders initiated other liberalizing reforms that allowed the free press and civil society organizations to flourish. Demands for democratization

[3] Interview with a Malian electoral expert, online, April 2021. Translated from French.

were then exacerbated by changing global conditions: with the end of the Cold War, international democratic standards were progressively enforced. International democracy makers provided electoral assistance and pushed for technological solutions in post-conflict situations. As a result of endogenous forces compounded by global prescriptions, elections became the norm, along with promises to curb fraud by creating independent election commissions and formalizing the electoral process. Of course, the routinization of elections does not equate to the generalization of democracy. The authoritarian instrumentalization of elections has since led to disillusionment. Interestingly, the recent 'democratic backsliding' (Arriola, Rakner, van de Walle 2023) has not called into question the success of election technologies. On the contrary, they thrive in such contexts: adopting technical remedies for electoral irregularities and fraud diverts attention from the repression of the opposition and voter intimidation.

The academic literature offers a fairly critical assessment of biometric voting. The most optimistic scholars tend to stress the 'mixed outcomes' of these technologies (Debrah, Effah and Owusu-Mensah 2019). They argue that while biometrics could 'chart the path for sustainable democracy in Africa,' numerous obstacles, including the cost, remain in the way (Idowu 2021). Other scholars point to their unintended consequences (Cheeseman, Lynch and Willis 2018; Okechukwu 2021; Eyenga 2023), which include logistical challenges, unnecessary expenditure, and loss of transparency (machines and databases are inaccessible to non-specialists). Context matters here. As Giulia Piccolino (2016) has shown, the impact of biometrics depends on a number of factors, including the politicization of citizenship and the role played by electoral management bodies. In their analysis, Alan Gelb and Anna Diofasi (2019) evaluate the costs and benefits of biometric identification and conclude that it does not significantly reduce the probability of post-election violence. Furthermore, they conclude that in countries where democracy is strongly institutionalized, this technology offers no significant additional benefits and is not a worthwhile investment. Taken together, these works reveal a paradox: the promises of the technology are not being kept, but the technology has been widely adopted across the continent. The questions raised by the surge in biometric voting go however well beyond an unfavorable cost-benefit ratio. In this book, I do not aim to assess whether the technology is working ot not. This has already been done, and we now have a clear idea of its limited – and often counterproductive – effects on the quality of elections. Rather, I ask: How does biometrics shape political practices and conceptions? Does it circumscribe or, conversely, open up the horizon of possibilities?

Technical practices and election technologies are not just the machinery behind the scenes of democracy. They belong fully to politics. This is best captured by the notion of 'technopolitics' put forward by Gabrielle Hecht (1998:15) and Timothy Mitchell (2002: 42-43). Although they offer two slightly different definitions of the notion, both scholars insist on the intertwining of technology and politics, highlighting how political actions and ideas are embedded within technological forms, and also how technology shapes the political sphere. Technological devices, material practices and expert knowledge are not isolated from the social world and its power relations. This is also true in the realm of elections. As we will see, biometric voting has been shaped by political interests and is embedded in the social. Yet, it has been promoted as a neutral, science-based methods of identification and verification. This framing is essential. The technology only 'works' if political actors and voters believe it to be neutral. At the same time, it has been contested in most of the countries where it has been deployed. In this research, I aim to study the two contradictory processes: the social construction of the neutrality of biometric voting and the politicization of the same technology. While some actors promote biometrics as neutral and objective, others – in some cases, the same actors – contest its supposed neutrality and objectivity. I argue that both aspects are equally important in understanding the success of biometric voting. The tour de force of the technology is to perform neutrality while being inherently political and prone to politicization.

Biometric voting is a politicized 'anti-politics machine' (Ferguson 1990). The anthropologist James Ferguson has masterfully shown that development programs are 'anti-politics machines' in that they depoliticize poverty and inequality. According to Ferguson, expert knowledge in the field of development tends to erase the political and structural causes of poverty by framing them as technical issues. Interestingly, the same logic applies to a domain that is eminently political, namely elections. International interventions carried out in the name of democratization have long favored a technicized and procedural conception of democracy (Abrahamsen 2000). Electoral assistance goes with a technicist conception of politics. Studying democracy engineering in postwar Bosnia-Herzegovina in the 1990s, Kimberly Coles (2007) shows that the focus on expert knowledge and techniques served one objective: to remove politics from the elections. International interveners' job was to build the credibility of the elections and to increase voter trust in them. To this end, they promoted structured, rigid bureaucratic practices, as well as various technical procedures deployed for voter registration and polling day. Trust, Coles concludes, is 'a

form of antipolitics, as it limits the possibilities of debate and confrontation through its use and normalization of technical procedures' (Coles 2004: 574). A decade later, on another continent, biometric voting was introduced as another antipolitics machine. The technology combines the depoliticization effects of both technical and bureaucratic practices. Behind the biometric kits and the databases, there are administrations, standards, and procedures. This new modality of democracy assistance places emphasis on the use of technological strategies to address complex political challenges (Jacobsen 2019). International interveners defined biometric voting as a response not only to the administrative question of how to create a reliable voter list in the absence of a population register, but also as a relevant method to increase trust in elections and pacify electoral processes.

Even if biometric voting has not achieved these objectives, it has still had major effects on political practices and conceptions, redefining the norms and standards of a 'good election.' As shown by Michel Callon (1984) and other sociologists of science, the adoption of a solution, whether technological or otherwise, constitutes an integral part of the construction of a problem. In the case under study, biometrics has contributed to the framing of certain types of fraud as *the* problem to be solved. It has shaped the political horizon in the countries where the 'solution' has been implemented. Its deployment has reproblematized democratic disillusionment and authoritarian practices as technical issues. Voter lists without duplicates and well-managed polling stations have become key aspects for defining a good election. The focus on biometric voter identification and authentication frames multiple registrations and multiple voting as the primary threats to the quality of elections, obscuring other issues such as ensuring the inclusion of all citizens.

However, the technology was soon caught up in political actors' strategies and became the subject of intense debates. These debates vary greatly from one country to another. In some countries, governments have deliberately biometrics used to exclude minorities. In Mauritania (Ould Ahmed Salem 2021) and Cote d'Ivoire (Banégas and Cutolo 2024), the biometric registration campaigns were used to target minorities, resulting in their exclusion from citizenship rights. However, in other contexts, the political opposition, and sometimes even civil society organizations, have strongly encouraged its deployment. For example, on labour day 2015, trade unions and civil society organizations in Chad marched behind a banner in favour of biometric voting. In neighbouring Cameroon, the opposition also advocated the use of biometrics to register voters and

verify their identity at polling stations. Mobilizations in favour of biometrics are deeply ambiguous: they refocus debates on the time of the election and make the discussion more specifically about technology while expressing a desire for democracy and change. The politicization of biometric voting and the place it quicky found in political debates across Africa are key to understanding why the technology remained popular even after experts and donors withdrew their support.

As the authors of *The Moral Economy of Elections in Africa* argue, elections are 'full of claims and demands that are explicitly moral' and 'people cast them in terms of what is right, and what should be done' (Cheeseman, Lynch and Willis 2020: 3). Biometrics is an entry point to explore these political and ethical conceptions. Following Antina Von Schnitzler (2016), I study the technical as a modality of political claims. Discourses on technology are also stances on progress, citizenship, the corruption of political life, and human relations more generally. Enthusiasm for biometrics is not naïve; it is a political language, a way of positioning oneself and claiming a space of democratic openness. These demands constitute the terrain from which democratic aspirations are constantly reformulated and negotiated. Biometrics has become a political terrain in its own right.

From the Polling Stations of N'Djamena to Paris Business District

The arguments of this book emerge from a decade of research on biometrics and election technologies in Africa. To grasp the invention of biometric voting and its implications, I have followed the technology from the polling stations back to the offices of its designers and vendors. I have combined two main methodologies: a systemic survey of biometric election systems used in African countries and the companies that sell them, and multi-sited fieldwork.

Firstly, this research is based on a mapping of election technologies used by the various countries.[4] The existing databases are incomplete, rarely up to date, and often based on legal adoption of the techniques, rather than their implementation in practice. The present work marks a departure from

[4] I am grateful to Guillaume Desgranges for his substantial contribution to data collection and analysis.

such databases – including that of the benchmark International IDEA.[5] The mapping includes the companies that have been awarded contracts since the early days of biometric voting. For each country, a systematic consultation of the open sources available online was carried out, covering press, election observation and electoral commission reports. The identification of private actors poses two main difficulties. First, official reports rarely mention private actors, and journalists do not usually go into such detail. Second, a contract is often awarded to several actors, each of whom divides the tasks in very different ways; this constitutes both a research result and a methodological challenge for data collection. Often several companies are involved, on either a subcontracting or partnership basis, making it very difficult to disentangle the actual division of tasks. Some companies communicate about their role and present their missions as successful, while others do not disclose which contracts they have been awarded. Third, the information available on the different countries is heterogeneous. In the Democratic Republic of Congo (DRC), for example, this is well documented, while in others, such as Nigeria (which uses multiple service providers for each election), the information is much more difficult to access.

In addition to the mapping of election technologies, the research for this book is based on ethnography and interviews. I first came across biometric voting in Chad in 2014, while researching political violence. In this country, where the political field has never been pacified (Debos 2016), the technology seemed to give new hope to political opponents. The public debate was turbulent: members of the presidential coalition and opposition parties clashed over technologies and whether they could fully trust a French company. Between 2014 and 2017,[6] I met members of the election management body, the electoral commission, the ruling party and opposition parties, trade unions and civil society organizations. I also spoke with the international actors who had been deployed in Chad: diplomats, executives and technicians from the company that had sold the biometric solution, as well as United Nations experts on biometrics and/or elections. For the 2016 presidential election, I observed the observers as a member of the fact-finding mission of the International Organization of La Francophonie (Organisation Internationale

[5] International IDEA, *ICTS in elections database*, https://www.idea.int/data-tools/data/icts-elections-database (accessed 5 March 2025).

[6] I have been conducting research on Chad since 2004. For this research project on biometrics, I undertook three research stints in December 2014, April-May 2016 (at the time of the presidential election) and June 2017.

de la Francophonie, OIF). A single person is rarely acquainted with more than one context, and it is only by drawing on the case of Chad that I can put forward any confident analysis of political actors' plural and contradictory logics of action. Based on this case study, I have written about the biometric voter registration campaign as (re)invention of the population and state formation (Debos 2021b). I have also written about technopolitical controversies (Debos 2018) and biometrics as the disciplining of democracy (Debos 2021a) – issues that I take up and explore further in the following chapters.

After this first research on Chad, I have pursued my investigation with multi-sited research on three continents: Africa, Europe and North America. As Laura Nader (1972) invited us to do half a century ago, I 'studied up.' This implies not only studying the elite but also people we, as social scientists, are not predisposed to like. This perspective allowed me to understand how decisions taken at the headquarters of firms and international organizations affect the lives of people located very far from the centers of power.

Contrary to the commonly held belief that innovations in election expertise, gender rights and international law originate in Europe and the United States, ample evidence suggests otherwise (Carapico 2013). The conference circuit is multinational and multicultural, with African experts and practitioners playing a pivotal role. They are part of a vast apparatus that includes international NGOs and UN bureaucracy, and we should not oppose 'Africans' and 'internationals.' Localizing the field in international political sociology involves going beyond the opposition between the local and the international in order to grasp the processes of internationalization or, conversely, of relocalization (Siméant-Germanos and Pouponneau 2022). The African actors who have made significant contributions to the development of biometric voting are multi-positioned. Some of them started their careers in politics or with an NGO in their home country and later joined international organizations or multinational companies. Conversely, others have opted for a career shift back to politics within their respective countries following an international vocation. International conferences and fairs make it possible to carry out a 'sociology of the plane ticket' (Siméant 2013) and to distinguish those who design interventions and negotiate technologies from those who implement or use them. At these international events, I met members of African electoral management bodies (the state administration in charge of the logistics of elections) and electoral commissions (the political side of the organization of elections). In addition to my long-standing

engagement with Chadian actors, I spoke with members of the electoral management bodies and commissions from the DRC, Somaliland, Benin, Mali, Cameroon and Kenya.

Immersion in the circles of biometric voting has been a key method of investigation. In 2014, I carried out participant observation in an international 'technical evaluation mission.' For the occasion, I donned the garb of an electoral expert, and in this capacity visited a Central African country which was setting up its first biometric registration of voters.[7] Biometrics conferences, associational meetings and trade shows are another crucial space for ethnographic observation. They allowed me to go beyond the discourse on the diffusion of technology. Immersion in these places makes it possible to grasp the 'concrete social relations that enable capitalism to function' (Laurens 2017: 207). I frequented the aisles of the World e-ID conference in Marseille (2016), the Biometrics Institute Congress in London (2017) and the Connect: ID conference in Washington DC (2019). To have a point of comparison, I also attended security fairs, such as the Milipol event in Paris, a major event for homeland security and safety, where biometric companies present their innovations for border security or law enforcement and share the exhibition space with arm manufacturers. I paid particular attention to the work of ID4Africa, the organization which convenes the continent's most important annual conference and exhibition on digital identity. I attended the conferences held in Abuja in 2018 and Johannesburg in 2019 – as well as its online activities. These conferences are key sites of observation because they bring together all the major stakeholders: vendors, buyers, donors, and experts. The vendors were predominantly white and male. Although I did not always share my respondents' worldview, I mingled quite easily with the crowd. As a white Frenchwoman, with a doctorate in political science, I did not stand out in the corridors of an international conference or a UN agency. Social proximity allowed me to grasp 'public secrets', what is known but cannot be said (Taussig 1999).

These periods of ethnographic observation were supplemented by sixty-five interviews (not counting those previously conducted in Chad). I met businessmen (far fewer businesswomen), engineers, philanthropists, election professionals and politicians. I visited them in the business district of La Défense in Paris, at the headquarters of the United Nations in New York and the World Bank in Washington DC. My interlocutors held different positions and roles: some produced

[7] I elaborate on this mission in Chapter Four.

reports or official statements, others were in charge of the acquisition of material or the logistics of elections.

Because they are still a blind spot in the current scholarship on electoral technologies and identification systems, I paid special attention to biometrics companies. The quasi-silence of the literature is partly explained by the culture of secrecy of this sector. I was able to obtain interviews with professionals of these companies, from senior executives to technicians, but my questions were often met with scrappy and contradictory answers. Unsurprisingly, they were more eager to speak about their competitors' misfortunes than their own challenges. One strategy to overcome this obstacle was to conduct interviews with former industry executives: as they had either retired or changed career path, they were more inclined to engage in discussions about practices in the industry.

Finally, whether they have promoted or criticized biometric voting (or changed their position over time), NGOs and Civil Society Organizations are part and parcel of the story. I have researched the role of various organizations in the fields of democracy promotion and privacy rights, since biometric voting lies at the intersection of the two. I have paid attention to the work of NGOs and foundations located in the Global North as well as in Africa. The boundary between advocacy work and academia is sometimes blurred. Experts who produce critical knowledge on technology, privacy, or elections circulate between academia and NGOs. This is not in itself problematic, provided that we bear in mind that 'the field is everywhere' (Mampilly 2020). Our work involves analyzing practices and motivations of the research and expertise networks in which we participate with the same critical distance and scepticism as we do with more professionally and socially distant groups and individuals.

Outline of the book

To be continued …

References

ABDELNOUR, SAMER AND SAEED, AKBAR M. (2014). 'Technologizing Humanitarian Space: Darfur Advocacy and the Rape-Stove Panacea'. *International Political Sociology*, vol. 8, n°2, pp. 145-163.

ABRAHAMSEN, RITA (2000). *Disciplining Democracy: Development Discourse and Good Governance in Africa*. London: Zed Books.

AGIER, MICHEL (2011). *Managing the Undesirables: Refugee Camps and Humanitarian Government*. Malden: Polity.

AMOORE, LOUISE (2008). 'Governing by Identity' in Colin J Bennett and David Lyon (eds.). *Playing the Identity Card: Surveillance, Security and Identification in Global Perspective*. London and New York: Routledge, pp. 21-35.

ANAND, NIKHIL, GUPTA, AKHIL AND APPEL, HANNAH (eds.) (2018). *The Promise of Infrastructure*. Durham: Duke University Press.

ARRIOLA, LEONARDO R., LISE RAKNER and NICOLAS VAN DE WALLE (eds.) (2023). *Democratic Backsliding in Africa? Autocratization, Resilience, and Contention*. Oxford: Oxford University Press.

AWENENGO DALBERTO, SÉVERINE AND BANÉGAS, RICHARD (eds.) (2021). *Identification and Citizenship in Africa: Biometrics, the Documentary State and the Bureaucratic Writings of the Self*. New York: Routledge.

BANÉGAS, RICHARD and ARMANDO CUTOLO (2024). *ID Wars in Côte d'Ivoire: A Political Ethnography of Identification and Citizenship.* Oxford: Oxford University Press.

BANEGAS, RICHARD (2003). *La démocratie 'à pas de caméléon' : Transition et imaginaires politiques au Bénin*. Paris: Karthala.

BIGO, DIDIER AND TSOUKALA, ANASTASSIA (eds.) (2008). *Terror, Insecurity and Liberty: Illiberal Practices of Liberal Regimes After 9/11*. London & New York: Routledge.

BOURBEAU, PHILIPPE (2011). *The Securitization of Migration: A Study of Movement and Order*. London: Routledge.

BRECKENRIDGE, KEITH (2020). 'Capitalism Without Surveillance?'. *Development and Change*, vol. 51, n°3, pp. 921-935.

BRECKENRIDGE, KEITH (2019). 'The Failure of the 'Single Source of Truth about Kenyans': The NDRS, Collateral Mysteries and the Safaricom Monopoly'. *African Studies*, vol. 78, n°1, pp. 91-111.

BRECKENRIDGE, KEITH (2014). *Biometric State: The Global Politics of Identification and Surveillance in South Africa, 1850 to the Present*. Cambridge: Cambridge University Press.

BROWNE, SIMONE (2015). *Dark Matters: On the Surveillance of Blackness*. Durham: Duke University Press.

CALLON, MICHEL (1986). 'Éléments pour une sociologie de la traduction : La domestication des coquilles Saint-Jacques et des marins dans la baie de Saint-Brieuc'. *L'année sociologique*, n°36, pp. 170-208.

CARAPICO, SHEILA (2013). *Political Aid and Arab Activism: Democracy Promotion, Justice, and Representation*. Cambridge: Cambridge University Press.

CHEESEMAN, NIC, LYNCH, GABRIELLE AND WILLIS, JUSTIN (2020). *The Moral Economy of Elections in Africa: Democracy, Voting and Virtu*e. Cambridge: Cambridge University Press.

CHEESEMAN, NIC, LYNCH, GABRIELLE AND WILLIS, JUSTIN (2018). 'Digital Dilemmas: The Unintended Consequences of Election Technology'. *Democratization,* vol. 25, n°8, pp. 1397-1418.

CHEESMAN, MARGIE. (2020). 'Self-Sovereignty for Refugees? The Contested Horizons of Digital Identity'. *Geopolitics*, vol. 27, n°1, pp. 134-159.

COLES, KIMBERLEY (2007). *Democratic Designs: International Intervention and Electoral Practices in Postwar Bosnia-Herzegovina.* Ann Arbor: University of Michigan Press.

COLES, KIMBERLEY (2004). 'Election Day: The Construction of Democracy Through Technique'. *Cultural Anthropology*, Vol. 19, n°4, pp. 551-580.

DEBOS, MARIELLE (2025). 'The Postcolonial Card Cartel How European Companies Sold Biometric Voting to Africa'. *Development and Change*, vol. 56, n°3, pp. 457-483.

DEBOS, MARIELLE AND DESGRANGES, GUILLAUME (2023). 'L'invention d'un marché: économie politique de la biométrie électorale en Afrique'. *Critique Internationale,* n°98, pp. 117-139.

DEBOS, MARIELLE (2021a). 'Biometrics and the Disciplining of Democracy: Technology, Electoral Politics, and Liberal Interventionism in Chad'. *Democratization,* vol. 28, n°8, pp. 1406-1422.

DEBOS, MARIELLE (2021b). 'Legible Bodies and Lives: How a Biometric Registration Campaign Reinvented the Chadian Population', in AWENENGO, DALBERTO, SÉVERINE AND BANÉGAS, RICHARD (eds.). *Identification and Citizenship in Africa: Biometrics, the Documentary State and the Bureaucratic Writings of the Self*. New York: Routledge, pp. 65-75.

DEBOS, MARIELLE (2016). *Living by the Gun in Chad: Combatants, Impunity, and State Formation*. London: Zed Books.

DEBRAH, EMMANUEL, EFFAH, JOHN AND OWUSU-MENSAH, ISAAC (2019). 'Does the Use of a Biometric System Guarantee an Acceptable Election's Outcome? Evidence from Ghana's 2012 Election'. *African Studies*, vol. 78, n°3, pp. 347-369.

DENCIK, LINA, ARNE HINTZ, JOANNA REDDEN and EMILIANO TRERÉ (2019) 'Exploring Data Justice: Conceptions, Applications and Directions', *Information, Communication & Society* 22(7): 873–81.

DEZALAY, SARA (2025). *Lawyering Imperial Encounters: Negotiating Africa's Relationship with the World Economy*. Cambridge: Cambridge University Press.

DONOVAN, KEVIN P. AND PARK, EMMA (2022). 'Knowledge/Seizure: Debt and Data in Kenya's Balance Economy'. *Antipode*, vol. 54, n°4, pp. 1063-1085.

EPSTEIN, CHARLOTTE (2007). 'Guilty Bodies, Productive Bodies, Destructive Bodies: Crossing the Biometric Borders'. *International Political Sociology,* vol. 1, n°2, pp. 149-164.

EYENGA, GEORGES MACAIRE (2023), 'Technicisation des registres de vote et participation matérielle au Cameroun'. *Réseaux*, n°421, pp. 239-273.

FERGUSON, JAMES (1990). *The Anti-politics Machine: Development, Depoliticization, and Bureaucratic Power in Lesotho*. Cambridge: Cambridge University Press.

FOG OLWIG, KAREN and KRISTINA GRÜNENBERG, PERLE MØHL, ANJA SIMONSEN (eds.) (2020). *The Biometric Border World: Technology, Bodies and Identities on the Move*, London and New York: Routledge.

FROWD, PHILIPPE (2018). *Security at the Borders: Transnational Practices and Technologies in West Africa*. Cambridge: Cambridge University Press.

FROWD, PHILIPPE (2017). 'The Promises and Pitfalls of Biometric Security Practices in Senegal'. *International Political Sociology*, vol. 11, n°4, pp. 343–359.

GATES, KELLY (2011). *Our Biometric Future: Facial Recognition Technology and the Culture of Surveillance*. New York: NYU Press.

GELB, ALAN AND CLARK, JULIA (2013). 'Identification for Development: The Biometrics Revolution'. Working Paper n°31, Center for Global Development.

GELB, ALAN AND DIOFASI, ANNA (2019). 'Biometric Elections in Poor Countries: Wasteful or a Worthwhile Investment?'. *Review of Policy Research,* vol. 36, n°3, pp. 318-340.

GUILHOT, NICOLAS (2005). *The Democracy Makers: Human Rights and the Politics of Global Order*. New York: Columbia University Press.

GUPTA, AKHIL (2018). 'The Future in Ruins: Thoughts on the Temporality of Infrastructure'. *in* ANAND NIKHIL, GUPTA AKHIL, APPEL HANNAH (eds.). *The Promise of Infrastructure*. Durham: Duke University Press, pp. 66-79.

HARDING, SANDRA (ed.) (2011). *The Postcolonial Science and Technology Studies Reader*. Duke University Press.

HIBOHECHT, GABRIELLE (1998). *The Radiance of France: Nuclear Power and National Identity after World War II*. Cambridge: MIT Press.

HIBOU, BÉATRICE (2017). *The Political Anatomy of Domination*. Cham: Springer Nature.

IBEANU, OKECHUKWU OBINNA (2021). *Digital Technologies and Election Management in Africa's Democratisation Process: More Technocratic than Democratic?*. Dakar: CODESRIA Working Paper Series.

IDOWU, HARRISON ADEWALE (2021). 'Biometric Technologies and the Prospect of Sustainable Democracy in Africa'. *Journal of African Elections,* vol. 20, n°1, pp. 23-43.

JACOBSEN, KATJA LINDSKOV (2019). 'Biometric Voter Registration: A New Modality Of Democracy Assistance?'. *Cooperation and Conflict,* vol. 55, n°1, pp. 127-148.

JACOBSEN, LINDSKOV KATJA (2015). 'Experimentation in Humanitarian Locations: UNHCR and Biometric Registration of Afghan Refugees'. *Security Dialogue,* vol. 46, n°2, pp. 144-164.

JEANDESBOZ, JULIEN (2016). 'Smartening Border Security in the European Union: An Associational Inquiry'. *Security Dialogue*, vol. 7, n°44, pp. 292-309.

KRAUSE, PETER AND SZEKELY ORA (eds.) (2020). *Stories From the Field: A Guide to Navigating Fieldwork in Political Science*. Columbia University Press.

LAURENS, SYLVAIN (2017). *Lobbyists and Bureaucrats in Brussels: Capitalism's Brokers*. London and New York: Routledge.

LYON DAVID (2009). *Identifying Citizens: ID Cards as Surveillance*. Cambridge: Polity Press.

MADIANOU, MIRCA (2025), *Technocolonialism: When Technology for Good Is Harmful*, Cambridge: Polity.

MADIANOU, MIRCA (2019), 'Technocolonialism: Digital Innovation and Data Practices in the Humanitarian Response to Refugee Crises'. *Social Media and Society* 5(3): 1–13.

MAGUIRE, MARK, RAO, URSULA AND ZURAWSKI, NILS (eds.) (2018). *Bodies as Evidence: Security, Knowledge and Power*. Durham: Duke University Press.

MAMPILLY, ZACHARIAH (2020). 'The Field is Everywhere'. in KRAUSE, PETER AND SZEKELY, ORA (eds.). *Stories From the Field: A Guide to Navigating Fieldwork in Political Science*. New York: Columbia University Press, pp. 277-285.

MANBY, BRONWEN (2021). 'The Sustainable Development Goals and 'Legal Identity for All': 'First, Do No Harm'". *World Development,* vol. 139, pp 1-12.

MANBY, BRONWEN (2020). '"Legal Identity for All" and Statelessness: Opportunity and Threat at the Junction of Public and Private International Law'. *Statelessness and Citizenship Review,* vol. 2, n°2, pp. 248-271.

MARKÓ, FERENC DAVID (2016). '"We Are Not a Failed State, We Make the Best Passports": South Sudan and Biometric modernity'. *African Studies Review,* vol. 59, n. 2, pp. 113-132.

MARTIN, AARON and LINNET TAYLOR (2020). 'Exclusion and Inclusion in Identification: Regulation, Displacement and Data Justice'. *Information Technology for Development* vol. 27, n°1, pp. 50-66.

MASIERO, SILVIA Masiero, Silvia (2024). *Unfair ID.* London: Sage, Data Justice Series.

MASIERO, SILVIA (2020). 'COVID-19: What Does it Mean for Digital Social Protection?'. *Big Data & Society*, vol. 7, n°2.

MAVHUNGA, CLAPPERTON CHAKANETSA (ed.) (2017). *What Do Science, Technology, and Innovation Mean From Africa?*. Cambridge: MIT Press.

MILAN, STEFANIA, TRERÉ, EMILIANO AND MASIERO, SILVIA (eds.) (2021), *COVID-19 from the Margins Pandemic Invisibilities, Policies and Resistance in the Datafied Society*. Amsterdam: The Institute of Network Cultures.

MITCHELL, TIMOTHY (2002). *Rule of Experts: Egypt, Techno-Politics, Modernity*. Berkeley: University of California Press.

MOROZOV, EVGENY (2013). *To Save Everything, Click Here: The Folly of Technological Solutionism*. New York: Public Affairs.

NADER, LAURA (1972). 'Up the Anthropologist: Perspectives Gained from Studying Up', in HYMES, DELL (ed.), *Reinventing Anthropology*, New York: Pantheon.

NELSON, ALONDRA (2002). 'Introduction: Future Texts', *Social Text*, vol. 20, n°2, pp. 1-15.

NYABOLA, NANJALA (2018). *Digital Democracy, Analog Politics: How the Internet Era is Transforming Politics in Kenya.* London: Zed Books.

OULD AHMED SALEM, ZEKARIA (2021). 'Hands off my citizenship!' Biometrics and its politics in Mauritania', in AWENENGO DALBERTO, SÉVERINE AND BANÉGAS, RICHARD (eds.), *Identification and Citizenship in Africa: Biometrics, the Documentary State and the Bureaucratic Writings of the Self*. New York: Routledge, pp. 203-220.

PERROT, SANDRINE, POMMEROLLE, MARIE-EMMANUELLE AND WILLIS, JUSTIN (eds.) (2016). 'The Production of the Vote: Placing Materiality at the Heart of the Analysis'. *Politique Africaine*, n°144.

PICCOLINO, GIULIA (2016). 'Infrastructural State Capacity for Democratization? Voter Registration and Identification in Côte d'Ivoire and Ghana Compared'. *Democratization*, vol. 23, n°3, pp. 498-519.

POLANYI KARL (2001) [1944]. *The Great Transformation: The Political and Economic Origins of our Time*. Boston: Beacon Press.

QUET, MATHIEU and KAMEDA KOICHI, JESSICA POURRAZ, YVES-MARIE RAULT-CHODANKAR (eds.) (2025). *Technoscientific Globalisation from Below*. Manchester: Mattering Press.

ROSNER, LISA (ed.) (2004). *The Technological Fix: How People Use Technology to Create and Solve Problems*. New York: Routledge.

SANDVIK, KRISTIN BERGTORA (2023). *Humanitarian Extractivism: The Digital Transformation of Aid*. Manchester: Manchester University Press.

SAWYER, KOFFI (2022). 'Can't Buy Me Trust: Why Are Africa's Elections So Costly Yet Contested?'. *African Arguments*, 20 October 2022.

SIMÉANT, JOHANNA (2013). 'Committing to Internationalisation: Careers of African Participants at the World Social Forum'. *Social Movement Studies: Journal of Social, Cultural and Political Protest*, vol. 12, n°3, pp. 45-263.

SIMÉANT-GERMANOS, JOHANNA AND POUPONNEAU, FLORENT (2022). 'Scales, Reefs and Bureaucracies – International Political Fieldworks'. *Political Anthropological Research on International Social Sciences*, vol. 2, n°3, pp. 115-143.

TAUSSIG, MICHAEL (1999). *Defacement: Public Secrecy and the Labor of the Negative*. Stanford: Stanford University Press.

TAYLOR, LINNET (2017). 'What is Data Justice? The Case for Connecting Digital Rights and Freedoms Globally'. *Big Data & Society*, vol. 4, n°2, pp. 1-14.

TILLEY, HELEN (2011). *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge*, 1870-1950. Chicago: University of Chicago Press.

VAN DER PLOEG, IRMA (2008). 'Biometrics and the Body as Information: Normative Issues of the Socio-Technical Coding of the Body', in BENNETT, COLIN J. AND LYON, DAVID (ed.), *Playing the Identity Card: Surveillance, Security and Identification in Global Perspective*. London and New York: Routledge, pp. 57-73.

VAN DER STRAATEN, JAAP (2019). 'Of Democracy, and Elections – in Reverse', 3rd Colloquium of the Bhalisa Identity Expert Group, University of Cambridge, 19-20 March 2019.

VON SCHNITZLER, ANTINA (2016). *Democracy's Infrastructure: Techno-Politics and Protest after Apartheid*. Princeton: Princeton University Press.

WEITZBERG, KEREN, CHEESMAN, MARGIE, MARTIN, AARON AND SCHOEMAKER, EMRYS (2021). 'Between Surveillance and Recognition: Rethinking Digital Identity' in Aid', *Big Data & Society*, vol. 8, n° 1, pp. 1-7.

ZUBOFF, SHOSHANA (2019). *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. London: Profile Books.