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## **The world's first biometric money: Ghana's e-Zwich and the contemporary influence of South African biometrics**

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## THE WORLD'S FIRST BIOMETRIC MONEY: GHANA'S E-ZWICH AND THE CONTEMPORARY INFLUENCE OF SOUTH AFRICAN BIOMETRICS

*Keith Breckenridge*

Two years ago the Ghanaian Central Bank began to implement a plan for the world's first biometrically regulated money supply. Banks have been flirting with the idea of substituting fingerprints for the flimsy and detachable pin codes on their cards for nearly two decades, but none of them have in mind the kind of scheme that is under way in Ghana. (Many of these plans draw on South African examples of biometric banking: Penrose 1995; O'Sullivan 1997; Krasner 1995; Guglielmo 1996; Anderson 2001; Evans and Schmalensee 2005.) The public face of the project, called e-Zwich, entails the free distribution to bank account holders of smartcards which can be accessed using an encryption key that is derived from the fingerprints of their owners. Behind closed doors the Central Bank has imposed the same biometric system for sharing information about account holders between the different banks. The e-Zwich has been purchased from Net 1 UEPS, the company that is responsible for the delivery of social grants to millions of South Africans (see Breckenridge 2005 for a more detailed account). But the Ghanaian scheme is much more ambitious than anything implemented in South Africa. The often repeated goal of e-Zwich is to make Ghana the first cash-free economy in the world. Perhaps the most interesting aspect of this project is that it might actually succeed.

In this article I want to explore the origins and working of the e-Zwich scheme, which, I think, highlight the way in which a particular set of biometric technologies, developed in South Africa, are being adopted by other African countries. In part, then, my object is to show how the post-Apartheid political economy has come to serve as a model and a source of the technologies of administration for many African countries. I also want to draw attention to the politics of this movement: in Ghana (as in Nigeria: see Breckenridge 2010) systems of biometric identification that were originally chosen to provide universal identity registration have been eclipsed by the effort to target people who might use the banks. Biometric identification is following the money. This is important in ways that are not immediately obvious.

The problem of money in West Africa has produced a provocative scholarly sub-field over the last decade. Prompted, largely, by Guyer's work, scholars have shown that the long and fraught history of money in Atlantic Africa has produced a very curious phenomenon indeed.

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There have been, in the first instance, a large number of physical currencies in this region over the last two centuries, and many of them have not been interchangeable. Nigerians, for example, can recall repeated attempts to replace the issued money supply and the wholesale abolition of the Biafran currency within the period of living memory (Ekejiuba 1995: 133, 154; Arhin 1995). This fluidity and the often obscure sources of change have fostered a view that money is essentially fickle, dangerous, and often magical (Falola 1995: 165; Guyer 2004: 11, 66, 105; Barber 1982: 435). The tremendously variable floods of cash in and out of the region have been shot through with conversion rituals and institutions of social ranking that work to mop up excess currency and convert private accumulation into public relationships (Manuh 1995; Guyer 2004: 40–1, 79; Barber 2007). Even the numbers used to measure accumulation and exchange seem to be subject to locally developed scales and threshold points that bedevil any general reckoning of accumulation (Guyer 2004: 19, 50–6). The biometric money that the Ghanaian Central Bank has in mind, if it succeeds, would have radical implications for each of these characteristics, but it is chiefly designed to address three other features of money in the region.

The first of these is the very limited role that formal banking institutions play in the region. As a proportion of the human population and as a share of the issued money supply, banks wield comparatively very little influence in West Africa. The e-Zwich scheme is an effort to draw a larger proportion of the population into the banking economy and to raise the levels of local capitalization by drawing a much larger portion of the issued money supply into bank accounts. A second key objective, in marked contrast with the now defunct *laissez faire* Community Banks scheme in Nigeria, is to extend the state's regulatory grasp deep into the informal and rural domains of the national economy (Mabogunje 1995). And, last, the scheme is a self-conscious effort to create a national instrument and measure of capital accumulation, in the face of a host of established informal and transnational practices that make a mockery of the post-colonial state's ability to influence and tax the economy (Guyer 2004: 117, 163; Hopkins 1970) None of these goals is likely to be easily achieved.

Ferguson has summarized the anthropology of money in Africa as the product of a conflict between centralized state policies of simplification and formalization and 'a vernacular logic' that resists both. Another way to put the same argument would be to say that the state and the market—the two parents of the money phenomenon that Keith Hart, another West African anthropologist, artfully identified—have long, perhaps always, been divorced in Atlantic Africa (Hart 1986: 638). For centuries the 'heads' side of the coin, which represents political authority, has been supplanted by market (and cultural) transactions represented by 'tails'. The e-Zwich scheme, and similar biometric surveillance projects in other African countries, clearly mark the renewed effort of central government, as *paterfamilias*, to reassert control over the children.

The stakes are high in this scheme, for individual Ghanaians, for their government, and for the South African company delivering the e-Zwich. One of my main objectives in writing this article is to suggest that the scheme might *not* fail. There are certainly historical precedents for strictly enforced centralized control over the money supply in West Africa. Perhaps the most famous, and influential, of these examples was Karl Polanyi's argument that the kingdom of Dahomey enforced a monopoly over the cowry money supply in order to regulate the market in slaves after 1727. Subsequent research has suggested that the monarchical monopoly that Polanyi described was much more tenuous, and much less important, than he allowed (Polanyi 1964: 390; Law 1977; Johnson 1980). In Ghana itself there is undeniable evidence for the nineteenth-century Asantehene's control over gold specie, and for the revolutionary consequences of its disintegration (Arhin 1995: 99; McCaskie 1983; 1986). But my other goal is to point to the way in which state administrative capacity, in the form of identity surveillance, is being carried by commercial biometrics into the terrain of monetary transactions, whilst simultaneously withdrawing from the areas of society that have no prospect of paying their own way. The development of the e-Zwich, in this sense, marks a retreat from an older, and broader, project of identification that was designed to bring to the state's attention members of the poor, rural, young and old population who very largely had slipped out of sight in the twentieth century.

The remainder of this essay consists of an examination of the two different projects of biometric identification in contemporary Ghana. The first part is a study of the introduction of biometrics during the international administrative tumult that followed the attacks of September 2001 for the purposes of building a national population register, and individual identity cards. For five years the national identity card project filtered painstakingly through all the different branches of the state, and then ground slowly to a halt out in the countryside during 2008. The second part of the essay examines the agents, objects, problems and prospects of the biometric money project that developed out of the ashes of the national identity scheme.

#### BIOMETRIC IDENTIFICATION AFTER 2001

Faced, as many of us are, by vexatious bureaucracies with an apparently insatiable appetite for credentials of identification, it is easy to view civil registration – the administrative recording of births, marriages and deaths – as one of the bars of Weber's iron cage. Scott had this in mind when he argued that surnames 'and the rolls of names that they generated were to the legibility of the population what uniform measurement and the cadastral map were to the legibility of real property' (Scott 1998: 67–8). Hazardous, and annoying, as legibility may be, there are certainly other, more persistent, dangers to being administratively invisible. Almost all of the world's poor face dangers

produced by a state that can barely see them at all (Setel *et al.* 2007). African states have inherited this kind of blindness from their colonial forebears; they share a common history of practically non-existent vital registration under colonialism and after it (Kwankye 1999). Parish birth registers, like those that have served as the basis of civil registration in many countries, are common. But they have not been joined to a national civil registration system (see Doyle 2008; also Zeitlyn 2005; Cooper 1996: 335; Kpedekpo 1968).

Ghana began to take vital registration seriously in the early 1970s, passing an 'Identity Card Decree' that required all citizens to register for a Citizen Identity Card. After a short programme of mass registration in the border regions of the country the state ran out of money, and the project was abandoned (Akrasi 2006). In the 1990s it made another forlorn attempt at paper-based registration. Although clearly more successful than the Nigerian identity registration programme undertaken at that time, vital registration in Ghana was observed mainly in the breach. At the start of the twenty-first century both countries were failing to issue birth certificates to more than 70 per cent of their people. The most important change in the degree and scope of identification in Africa came after the development of automated fingerprint registration systems (Kwankye 1999; Baiden 2008; Kpedekpo 1968; NIA, Ghana 2005).

In 2001 the Ghanaian government announced that it wanted to develop a new national system of biometric identity registration, and called for tender proposals. The plan required an outside company to manage an all-inclusive, two-year project that would develop, implement and then transfer a national infrastructure for identity registration. In practice this meant that the contractors had to build a large Automated Fingerprint Identification System (AFIS) to store and authenticate fingerprint submissions, outfit over a thousand mobile registration stations with fingerprint and biographical data capturing equipment, build a local factory for card manufacturing, and come up with a networking arrangement for transferring data in the absence of an existing telecommunications system. The card was a simple plastic one with an encrypted barcode representation of the fingerprints. By 2003 the short-listed contractors included Sagem, Hewlett-Packard working with Printrak, a small Israeli company called NIKUV, and the South African Marpless consortium (Baiden 2008; Papoe 2004).

The involvement of Sagem in the Ghanaian project, as sordid allegations of official bribery in an identical scheme were being trumpeted in the Nigerian press, prompted some Ghanaians to question their government's publicly announced commitment to 'zero tolerance' for corruption. The South African consultants working with Marpless have suggested that the involvement of the French government was the most persuasive element in Sagem's proposal (Sule 2003; Mensah 2003; Papoe 2004; Informant 8 2007). But other commentators took the not unreasonable view that the French company was the only candidate with the global experience required for a large national biometric registration project.

After Sagem had been granted the tender, the officials at the National Identification Agency began to discuss the implementation of the new system with government departments and political constituencies. Two key problems began to emerge some years before the registration even began. The first of these was the dishevelled state of the Births and Deaths Registry, the division of the state nominally responsible for producing the documents that Ghanaians would need to prove their identities. The bushy-tailed officers of the National Identification Authority (NIA) – unencumbered by real offices or paperwork, with technical capacity purchased cleanly from one of the leading multinationals, biometric tools of identification and an almost mystical database – confronted the long-suffering administrators of the Births and Deaths Registry. That body had a century-long history of underfunding and was staffed – in its own words – by ‘personnel with low capacity’; dire shortages in transport, office furniture and computers completed the dismal inventory. Yet the identity card campaign, and renewed support from UNICEF, injected new urgency and significance into the infrastructure of vital registration in Ghana; in 2004 the rate of birth registrations jumped dramatically from less than 30 to nearly 50 per cent of estimated births (Birth and Death Registry 2009; Nartey and Allan 2004; NIA, Ghana 2005; GNA 2004).

A second problem bedevils almost all African states’ efforts to draw a boundary line around their population: a workable test of citizenship in the context of fluid boundaries and centuries of migration. In Ghana’s case the problem was exacerbated by large numbers of expatriates claiming dual citizenship. In NIA discussions with officials from the Births and Deaths Registry, the fact that only a tiny minority of Ghanaians had the birth certificates that would allow them to prove their citizenship suggested that a radical solution was required. ‘The NIA plans to meet with professionals like lawyers, political scientists to outline a clear definition that raises no doubt about who a Ghanaian is,’ the officials promised, ‘and this strict definition will be saved in the database.’ The database, of course, was of very little help with this problem, and the Ghanaian state ended up relying on the temporary workers to make a decision about nationality based on discussions with ‘your parents, head of family and/or local traditional leaders’ (NIA, Ghana 2007a). In practice long queues and production pressures meant that those with anything resembling a case for Ghanaian citizenship generally got it. In the future, of course, the database may well adjudicate this problem, and adults whose identities have not been properly captured may find that they struggle to secure citizenship.

In the national political debate about the introduction of the identity card there was warm consensus between the two main political parties about the developmental and political benefits that would follow from the introduction of identity cards. When the legislation enabling the compulsory gathering and storage of biometric data was finally pushed through Parliament in 2006 it was passed unanimously. Both the government and the opposition lauded the project as an ‘important step forward’ in Ghana’s history, and as a ‘very crucial tool’ of development.

Identity cards would bolster the integrity of both 'public and private business transactions' and, more mysteriously, 'increase social services'. The only real disagreement was whether the project was sufficiently ambitious (Akrasi 2006).

The registration drive, involving 1,500 mobile units and some 40,000 employees, began at last in mid-2008, after another year of delay. Small teams of temporary workers moved out into the villages of the four coastal regions, with laptops, digital cameras and Morphotouch fingerprint scanners. Long queues formed at temporary registration centres that were set up in schools and post offices in spite of fears that the state would be able to use the cards to levy income tax for the first time. Some of these people may have been worried about subtle threats that those without an ID card would not be able to access the health system or find places in schools for their children. But for many the registration process held out the promise of more substantial and direct state welfare. This optimistic interest in registration was bolstered by a strong patriotic emphasis on citizens' moral obligation to register their identity. Gospel choirs in public service announcements on the television exhorted all Ghanaians 'over 15 years' to do their 'national duty now' by registering with the National Identification Authority (Burnette 2008; GNA 2008b; Anon 2008).

There were some critics of the project. Aside from the off-stage whispers about the fact that the state might now be able to raise taxes from the invisible majority working in the informal economy, many people wondered how Ghanaians could have individual (and national) identities without street numbering. The delay in starting the registration campaign meant that the identity and voter registration projects were busy at the same time. The leader of the opposition People's National Convention (PNC) and future Vice-President, Dr Mahama, worried that identity registration would confuse voters, and he called for the project to be suspended during the election. But Mahama was not trying to kill off the project. Following in the footsteps of his Nigerian and South African peers, he called for the identity card to be expanded into a multifunctional instrument; his government would 'put in place a single system that would be used for the purposes of a National ID, voter identity as well as use such identification system to ensure effective tax system in the country' (NIA, Ghana 2007b; GNA 2008b).

For the first few months the registration proceeded well, capturing nearly two thirds of the adult population in the three regions closest to the capital, Accra (but not the city itself). In December 2008, as the fifteen hundred mobile registration teams were busy in the Volta Region (the former territory of British Togoland) the NIA, like its Nigerian counterpart, began to run out of money. Three months later, in March 2009, the mobile operators staged a protest, demanding the \$450 monthly payments that had been stopped in December. The newly elected government agreed to release the funds necessary to back-pay the operators' outstanding wages but, showing little apparent enthusiasm for their predecessors' project, did not budget the

necessary additional funds and the project ground to a halt, despite the protestations of the NIA officials to the contrary. At that point only the Eastern, Central and Western regions had been covered, leaving the most populous areas—Ashanti and Greater Accra—and the least accessible ones—Northern, Upper East and Upper West—completely untouched. In July 2009 the Director of the Identification Authority, Professor Ken Attehuah, was summarily dismissed, leading the main Accra radio station to observe that the whole identification ‘exercise has stalled with no clear indication when it will resume’ (Nyaaba 2009; GNA 2009a; Staff Writer 2009a; Aglanu 2009).

The striking similarity between the Ghanaian and Nigerian biometric identification projects—Sagem’s involvement, the barcoded card, the centralized fingerprint repository, the use of mobile registration teams, and the identical pattern of failure as the financial and administrative costs of delivering nation-wide registration mounted—was repeated in the scheme that began to emerge from the collapse of the Ghanaian national identity card. In both countries the state has turned to a biometrically authenticated smartcard as a platform for the provision of a much more limited, and self-funding, mechanism for consumer credit monitoring and financial services to the great majority of people who make no use of the banks. But there is an important practical difference between the two countries. Where the Nigerian government has modelled their new smartcard on the South African system, but adopted a technology and communications structure that is taken from Malaysia (once again under the influence of Sagem Morpho), the Ghanaian Central Bank has purchased a biometrically controlled, offline, smartcard banking system from Net1 UEPS, the company responsible for the development of the massive biometric social welfare grants infrastructure in South Africa.

#### BIOMETRIC MONEY

During 2006, as the enabling legislation for the identity card project became mired in the Ghanaian legislature, the Ivy League-educated, self-consciously progressive governor of the Ghanaian Central Bank, Dr Paul Acquah, issued a tender for a national interbank switch—the networked, central database system that allows all banking transactions to be resolved. The Ghanaian tender had several features that distinguish it from similar interbank settlement systems. It should, as a key condition, ‘meet the requirements of the banked and the unbanked’ and provide a ‘smartcard (based on biometric identification payment system) which is compatible with the national switch’. In its main objectives the Ghanaian switch clearly had in mind the services of the South African biometric financial services company, Net1 UEPS.

In South Africa, Net1 UEPS is the holding company of the deeply precocious biometric social grant delivery company called Aplitec, founded by Serge Belamant, a French-born computer scientist. Belamant developed the interbank SASwitch in South Africa in the early 1980s, one of the largest and earliest settlement systems in the



world, but one that had, also, a rich and bitter history of trench warfare between proprietary standards. Since the end of the 1990s his company, Net1 UEPS, has been working frantically to build an alternative to the Europay-Mastercard-Visa (EMV) standard, geared specifically to the needs of the third-world poor and using a patented biometric system of authentication. By the end of 2009, aside from Ghana and Nigeria, Net1 UEPS had large biometrically delivered payment systems in place in South Africa, Namibia, Botswana, Malawi and Iraq (Breckenridge 2005; 2008).

The system developed by UEPS is, as Belamant has observed repeatedly, aimed at the very poor, illiterate people who 'are not going to remember the pin number on the card'. It is also specifically geared to the fact that networked communications infrastructure, and electricity, is generally absent in much of the African continent. The UEPS system, quite unlike the network-dependent settlement systems used by the EMV, and most other banks, stores the transaction data on the card itself. This means that each card carries its own running balance, and a history of up to 800 transactions, that can be updated periodically through a networked machine. The cards use a proprietary system of biometric encryption, where the data is encoded using a template derived from the user's fingerprint impressions. The Net1 smartcard has been very widely used in South Africa where the company distributed social grants to some 5 million people in the period after 2002 (du Toit 2008; Belamant 2006).

The e-Zwich system that Net1 offered to Ghana – and which won the tender in June 2007 – differed in some key respects from the one that was in place in South Africa. The Ghana Interbank Payment and Settlement System (GhIPSS) was, in the first instance, owned and authorized by the Bank of Ghana, offering it a legally protected monopoly of all bank transactions. Unlike the Aplitec social grants system, the Ghanaian contract included a full Automated Fingerprint Identification System designed to store and match the fingerprints of the entire population of users. Each of these novel features would have powerful effects on the operation and functions of the GhIPSS system, not the least of which was that the income from transactions on the cards was controlled by the Central Bank. (Net1's projected income from the project, aside from the original \$20 million contract, amounts to about \$3 per card per annum, mostly from licence fees and hardware sales.) Another innovation, reflecting the growing anxiety about robbery on the continent, found its way on to the e-Zwich cards: the recording of an 'alarm finger' which would, temporarily, deny access to all funds on the card save for a pre-set emergency amount 'with which to appease the criminals' (Stewart 2009; Marketwire 2007; du Toit 2008).

When the e-Zwich project was launched in April 2008, the President of Ghana, John Kufuor, made no comment on the remarkable fact that Ghana was introducing the world's first biometric banking system. His comments were focused, instead, on the cards' potential to 'transform the financial services industry and link it with every aspect of the

nation's economy', and his particular concern was the incorporation of the 'informal sector'. For Paul Acquah, the Central Bank governor, the e-Zwich cards offered a technological remedy for the fact that fifty years after independence some 80 per cent of the population still remained outside of the banking system. Net1's biometric smartcard would mean that 'even in the remotest parts of the country where electricity and telecommunication facilities are unavailable' electronic banking had 'come to the doorstep of all Ghanaians'. This stress on the transformational potential of the extension of the banking system, of the revolutionary possibilities of formal credit, may reflect the influence in Ghana of the neo-liberal economics that Michel Foucault analysed in the late 1970s. But a more mundane and immediate concern was to find a way to harness the paper money actually in circulation for bank capital. Brenda Stewart, Net1's marketing vice-president, explained the Ghanaian Central Bank's project thus: 'There's a lot of cash changing hands that is not in the monetary system' (Koranteng 2008; Stewart 2009).

Moving from a society with almost no meaningful banking infrastructure to one that has some of the key features of cashlessness seemed, initially, to be a simple process. In order to retain a banking licence all local banks had to join the GhIPSS system and commit to a minimal level of networking, provided either by MTN, the South African cellular telecommunications firm, or through a landline provided by Ghana Telecom, to set up the settlement process with the Central Bank switch. Within a month of the project's launch a handful of the local banks had achieved the required networking. The installation of hole-in-the-wall ATMs with fingerprint readers (which have never formed part of Net1's infrastructure in South Africa) proved difficult and expensive, and it was only in December that the supplier, Britain's De La Rue, managed to deliver a handful of machines. And, for the commercial banks, providing ATMs for the local and foreign customers who wanted to use offshore EMV-compatible VISA cards remained a more important business consideration than servicing the e-Zwich account holders.

For ordinary Ghanaians the e-Zwich system consists of two parts. The first is the smartcards, which, in the first year of the project, were issued at special fingerprint capturing stations in the commercial and community banks. The cards bear the branding of the issuing bank and a visible smartcard but, unlike credit or debit cards, they carry no individually identifying names and no numbers. The cards are very oddly blank. This void is by design – there is little incentive to steal the cards because only the fingerprints of the owner can provide the encryption key to access the bank account information – but it makes the e-Zwich unnervingly unlike paper money with its elaborate nationalist iconography and conspicuous denominations. The e-Zwich cards are also of little use to the tiny number of Ghanaians interested in online shopping (Ajao 2008).

In order to make payments or move funds between the cards, users must find a working e-Zwich point-of-sale (POS) machine. These



FIGURE 1 The e-Zwich smartcard

devices look very similar to conventional credit card authorization terminals, except that they have fingerprint readers and a slot in the base of the machine for the e-Zwich card. The Ghanaian banks issue the POS machines to merchant account holders, and merchants earn a small fee on transfers between card accounts paid directly in their own accounts. The Ghanaian banks were initially quite successful in distributing these POS machines, unlike the ATM machines. Two months after the launch journalists from the *Daily Graphic* reported that amongst formal businesses in downtown Accra 'most of the merchants' POS machines were in use, but only a few clients had used their smartcards to make purchases' (Aggrey 2008; Robertson 2008; Ajao 2008). A year after the system had been introduced slightly more than 2,000 shop owners had taken possession of their machines. But there were still real limits on the degree to which the cards would support a cash-free economy. In June 2009 a reporter in Accra described how, after loading money onto his e-Zwich card, he 'had to roam the city looking for a fuel station which accepts the card, so he could refuel his car' (Thompson 2008; Robertson 2008; Dogbevi 2009; GNA 2009b; Nonor 2009; Staff Writer 2009b; Yeboah 2009a).

The merchants' e-Zwich machines were also difficult to use and maintain. Journalists reported the angry stories of e-Zwich account holders struggling unsuccessfully to secure the cooperation of shop attendants and bank tellers. And for the shopkeepers the machine introduced a new, and potentially explosive, dynamic into the workplace as card holders began to hold them responsible for their unexpectedly depleted bank accounts. 'Some of the customers come to us with the belief that they have money in their cards only to be disappointed by the point of sale device', one attendant complained; 'It's a lot of hell.' The biometric encoding of the cards produced another hazard as users battled to get the machines to read their

fingerprints successfully. The biometric readers' capacity for yielding false positives created another. Some shopkeepers reported angry encounters with card holders who had been turned away because the machine claimed that they were not the rightful owners of the card (Abdul-Rahman, Attah and Boafo 2009).

But the most common problems reflected the weakness of the communications infrastructure in Ghana. Although the e-Zwich has been designed to support offline transactions between smartcards, merchant owners of the POS machines were required to complete a reconciliation with the central server at the end of every working day (or after 800 transactions). This connection was delivered though the wobbly cellular network, which meant that merchants had to have on hand, every day, a source of electricity, sufficient prepaid airtime to complete the connection and a reliable cellular single. Failures were commonplace (IMANI Center for Policy and Education 2010).

Yet it is unlikely that these difficulties will hamper the development of e-Zwich. The expansion of the biometric banking card system clearly has some dramatic advantages over the national identification programmes. The first is that the state has real influence over the provision of banking facilities. Unlike the identity card systems, the Ghanaian biometric banking system is a policed monopoly. An immediate result of the issuing of the GhIPSS tender to Net1 was that the older bank settlement systems were simply prohibited. Towards the end of the year these companies, and other advocates of a free market in banking systems, began to complain that the companies that had previously 'provided switches and ATMs for various banks in the country, have had their services declared illegal' with the result that they came to 'an abrupt end' (Thompson 2008).

Much more importantly, the state's control over many of the key points at which paper money enters the economy gives it a special kind of leverage. The key advantage of the e-Zwich system here—regardless of whether users are able to use the cards for daily transactions—is that it automates and controls the state's payroll. At the launching of the project the government promised that all salaried employees, and almost all the other sites of cash transactions—'pensioners, churches, Controller and Accountant General's Department (CAGD), Customs Excise and Preventive Service (CEPS), Electricity Company of Ghana (ECG), rural banks, Savings and Loans Companies and banks would become part of the e-Zwich system' (GNA 2008a). Few of these sites were moved over to the system in the first year, but the allure of efficiencies and advantages for both the state and its employees remains. Crucially, the new government, elected in 2008, adopted the promise of its predecessor, looking 'forward to the day when its employees will be paid through e-Zwich as a means of minimizing the existence of ghost workers in government department payrolls' (Yeboah 2009b; Staff Writer 2010). The e-Zwich manager's ability to reward the largest processors of cash—like the cement merchants—equips them with a formidable power in this struggle.

Officials implementing the new system have worked hard to persuade the large employers of the Association of Ghana Industries to use it, pointing to the efficiencies of automated payments. They stressed that the biometric cards ‘eliminated the need to have basic literacy and numeracy’ and would ‘encourage the habit of savings among the employees’ (GNA 2009c). The Central Bank spent much of 2009 meeting with the key organizations of recipients of cash payments—coffee growers, vegetable farmers, schools—to persuade them to move their members over to the smartcard system (often inviting banks to attend the meetings in order to sign up users on the spot). Bullying the banks to adopt the system, at their own expense, was a simpler task. By Central Bank regulation all banks are required to issue the biometric cards to all customers and to use them for all transactions including electronic payments and cheque clearing; even pre-paid cellular airtime had to be compliant with the e-Zwich (Business Desk 2010). Officials also encouraged small rural lenders to use the e-Zwich cards to ‘mobilize deposits for their banks’ (GNA 2009b; Nonor 2009; Yeboah 2009a; Staff Writer 2009b; Bank of Ghana 2008; GNA 2008a). Working together, the banks and the officials assigned to e-Zwich announced plans to visit the owners of the POS machines and to undertake a vigorous programme of training for merchants.

Occasionally in these discussions the bankers have mentioned that the system of electronic payments will equip the Central Bank with useful data on financial transactions in the country. In a speech to mark the installation of the first biometric ATM machines, Dominic Donkor pointed out that ‘electronic payments maintain an audit trail and complete transparency which goes a long way to minimize corruption’ (Donkor 2009). In general, however, the bank officials have not belaboured the new kind of scrutiny that the e-Zwich system will support. A consideration of the capacities of the system makes it easy to understand why that might be case.

If it works, the e-Zwich system will offer the Ghanaian Central Bank surveillance of the economy, and the individuals caught up in it, that is historically unprecedented. The Net1 system that has been implemented in Ghana is different from the one in operation in South Africa in some key respects. Chief amongst these is the fact that all ten fingerprints captured are stored using a proprietary standard in a centralized, searchable fingerprint database (an AFIS); it is this capacity for rapid and accurate one-to-many matches which gives the e-Zwich system the capacity to identify ghost workers, comparing the unique pattern of an individual applicant’s fingerprints against the whole population of registered clients. All bank accounts in the e-Zwich system are also linked to the national identity number (which, in turn, is linked to the biometric patterns in the AFIS), giving the Central Bank the power to record all the transactions of all the individuals using the system. This means, in practice, that the e-Zwich records the biographical details, the times, places, and amounts of all transactions on the system. A good way to think about the capacities of the

e-Zwich would be to compare it to the database records of mobile phone companies, with the additional attributes of the amounts transferred and, critically, identifying biometrics. All these data are required for the system to work. As it is currently set up all of this information is controlled by Net1 and instances of obvious fraud are reported to the Central Bank. It is obvious why these oversight features have not been popularized; this central government regulation of the money supply is the opposite of arrangements that have prevailed in West Africa for many centuries, and it is likely to provide a powerful reason for many Ghanaians to avoid the cards (Stewart 2009).

Interestingly, Ghanaian commentators, perhaps because they despair of the virtues of the informal economy, have begun to use the e-Zwich as an example of the ways in which the country might successfully adopt radical administrative technologies: the e-Zwich serves as a metaphor of a self-consciously modern form of government action with few meaningful precedents. At the start of 2009 critics of the country's electoral system used the e-Zwich (not the parallel process of biometric identity registration, which had come to a halt) as an example of what might work to control the country's perplexing voter registration process. In January, as the controversy over vote rigging raged in Ghana, the editor of *The Statesman*, Gabby Otchere-Darko, suggested that the e-Zwich, 'a technology that would have been considered too advanced for Ghana... now being used by market traders' should be extended 'to our electoral system'. Six months later, after Barack Obama's visit to the country, journalists again argued that 'a biometric system of voting, like the e-Zwich' would protect Ghana's reputation as a 'beacon of democracy in Africa' and 'lead the way yet again in demonstrating a method and a means by which to overcome one of the major hurdles facing young democracies in Africa'. Just weeks later the Minister of Communications announced that Ghana would introduce biometric voting by 2016, or 'if things go well we may even start with it in 2012' (Otchere-Darko 2009; Hamid 2009; Staff Writer 2009c; for other schemes based on the e-Zwich see Simons and Cudjoe 2009). This optimistic assessment is significantly different to the popular view of the other identity projects, and it suggests that, at least in its early period, Ghanaians do not see the project as a technological failure.

Not everyone is enthusiastic about this. For some Ghanaians, influenced by the millenarianism of evangelicals in the United States, the problem is that the system places the country at the forefront of technologically driven identification. These people worry that the e-Zwich is the first step in the global movement towards the moment prophesied in Revelations (13: 17-18) where 'no man might buy or sell, save he that had the mark or the number of the beast'. Here the problem is not that the system will fail. On the contrary, the fact that 'no day passes without an advert on the radio or TV without a promotion of this dangerous thing' means that Ghana 'is becoming the first in anti-christian activities in Africa' (Osei 2008).

## CONCLUSIONS

There is certainly much that seems strange about the Ghanaian e-Zwich project. It is difficult to believe that a country that had no meaningful credit card system, no reliable electricity supply, or even street addresses will be the first to implement a biometric payment infrastructure. Yet in an important sense it is the absence of a pre-existing system of payments that makes it possible for Ghana to move its entire banking sector on to Net1's biometric standard. As that company's Brenda Stewart observed, 'Ghana has been able to take up the world-first initiative because it has no Visa or MasterCard infrastructure in place' (du Toit 2008). In this, at least, the idea of leapfrogging (which recurs almost continuously in African discussions of biometrics) has a kind of power. The new smartcard and cellular networking and biometric technologies will, I think, equip African states with new tools to capture and order the economic activity that has long sought to escape central power, but the outcome of this struggle is clearly a long way off. Here the new information technologies are working precisely against the new collectivism described by Keith Hart (2000: chapters 6 and 7). At the very least it is important to understand the plans and motivations of the current generation of administrative progressives like Ghana's Central Bank governor, Paul Acquah.

Some outcomes of the Ghanaian experiment with biometrics are already clear. A year after the e-Zwich scheme was launched about 2,500 merchants had installed the biometric point-of-sale machines, and just over 300,000 people had been issued with the cards. This provides some insight into one of the most important but imponderable characteristics of money in Africa: the idea that unbanked people have, as Net1's Brenda Stewart noted, 'lots of cash' that might be available to capitalize bank lending. This idea is certainly very widely held (see, in South Africa, Breckenridge 1995: 290). 'It is common knowledge,' Akin Mabogunje suggested some time ago, 'that most rural Nigerians keep their money and their savings in such places as under their pillows, under their mattresses, in gourds kept in the ceiling, and sometimes buried in the ground' (Mabogunje 1995). Yet, a year after the e-Zwich was introduced, there is little sign of those unbanked treasuries, with slightly more than \$1 million dollars (or \$3 per person) being retained on the entire system. As one of e-Zwich's critics has noted, the four out of five Ghanaians who are poor and without access to the banks simply do not have money. 'The middle and upper classes control the country's wealth and they are generally [already] well-banked' (IMANI 2010).

Another important point is that African countries seem irrevocably committed to biometric identity registration. There is some irony in the fact that they are adopting a model of biometric civil registration that was first attempted, unsuccessfully, in South Africa in the 1940s. At that time officials in the Native Affairs Department argued that 'in view of the vast illiterate population, many of whom have no fixed abode' the only 'practicable means of registration is by a system of

finger prints' (F. R. for Secretary for Native Affairs 1949). This model of registration was anything but a success, and today South Africans are still struggling with an unreliable and inflexible system of identity registration. The officials involved in the selection of the e-Zwich system, and the engineers working for Net1 UEPS, are choosing to ignore the very different histories of the two countries. How this will work out remains to be seen.

But there are two further features of the current round of biometric registration that I want to highlight. The first is that this system is self-consciously designed as a remedy for what officials, and donors, see as the problem of pervasive illiteracy. This is a complex problem, and all I would do here is point to the fact that the poor in Africa are much better equipped to deal with the politics of literacy than they are ready to negotiate the mute politics of centralized and automated biometric registration (see for example Barber's discussion of virtual literacy in Barber 2000: 317–47; Zeitlyn 2001; Zeitlyn 2005; Peterson 2004; Barber 2006). The second point is that these systems of biometric registration can serve, as has been the case in South Africa, as technologies of inclusion, working, very efficiently, to provide the old, infirm and the young with a measure of social security (Breckenridge 2005). But that will certainly not happen automatically, especially where the costs of biometric registration are being borne by bank transactions.

A close reading of the history and anthropology of money in West Africa suggests that we should be profoundly sceptical of the e-Zwich scheme, and that we should view it as only the most recent of dozens of similar failed attempts by the central state authority to capture the culturally differentiated field of value transactions that make up the West African economy (Berry 2007; Guyer 1995; Roitman 2007; Guyer 2004; Falola 1995). The weight of history suggests that the Ghanaian poor will find ways to defeat the formalizing agenda and surveillance capacity of the e-Zwich and that they will find ways to write local and contingent meanings into the blank biometric money. Yet it is still much too early, I think, to determine whether the Ghanaian biometric payment system will work or fail. The enormous success and power of the system of biometric grant payments in South Africa suggest that it is not, at least, an impossible project.

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#### ABSTRACT

In January 2008 the Ghanaian Central Bank announced that it had introduced a new centralized mechanism for the settlement of transactions between the Ghanaian banks. This interbank switch, as it was called, was purchased from, and managed by, the South African company Net 1 UEPS, and it had a unique central organizing principle. The switch was indexed biometrically, using a key derived from the ten fingerprints of account holders. This new interbank switch and a smartcard encoded in the same way has equipped Ghana with the world’s first biometric money supply. This article is an effort to explain the development and significance of this biometric money, which Ghanaians call the e-Zwich. It traces the way in which biometric registration in Ghana (as in other African countries) has leaked from the mundane, difficult, and mostly unrewarding, task of civil registration into the more properly remunerated domain of monetary transactions. Viewed in the light of the rich historical anthropology of money in West Africa, what is at stake in Ghana may be much more significant than any of the current participants fully realize. Perhaps the most interesting finding of this study is that the e-Zwich system might actually succeed.

#### RÉSUMÉ

En janvier 2008, la Banque centrale du Ghana a annoncé l’introduction d’un nouveau mécanisme centralisé de règlement des transactions entre banques ghanéennes. Ce mécanisme, appelé « interbank switch » (transfert interbancaire) et acheté auprès de la société sud-africaine Net 1 UEPS,

qui en assure également la gestion, s'articulait autour d'un principe central unique. L'indexation des transferts était biométrique et utilisait une clé dérivée des dix empreintes digitales du titulaire du compte. À travers ce nouveau système de transfert interbancaire assorti d'une carte à puce codée selon le même principe, le Ghana dispose du premier système monétaire biométrique au monde. Cet article tente d'expliquer le développement et l'importance de cet argent biométrique que les Ghanéens appellent l'e-Zwich. Il retrace l'évolution de l'enregistrement biométrique au Ghana (comme dans d'autres pays africains), quittant les limites de la tâche d'état civil prosaïque, difficile et souvent peu gratifiante pour filtrer le domaine plus adéquatement rémunéré des transactions monétaires. À la lumière de la riche anthropologie historique de l'argent en Afrique de l'Ouest, ce qui est en jeu au Ghana peut être bien plus important que ne le réalise pleinement les participants actuels. La conclusion la plus intéressante de cette étude est peut-être que le système e-Zwich a des chances réelles de réussir.