

Research Article

The Informationalization of Poverty in Africa? Mobile Phones and Economic Structure¹

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Abstract

Many claims are made about the transformational developmental impacts of new ICTs, particularly mobile phones, on Africa. However, such claims neglect other structural dynamics and the contradictory impacts of mobile phones, which can reduce, but also sometimes increase, poverty. This paper re-examines the role of mobile phones in African development and poverty, drawing on the concept of articulation. While mobile phones are meant to help “flatten” the world and allow for economic development through facilitating connection between places, they often serve to reinforce the dynamics of uneven development. Consequently, while mobile phones may be “socially articulating,” they recreate (new) forms of economic disarticulation, thereby replicating patterns of Africa’s adverse inclusion in the global economy. The occlusion of these dynamics in the literature arguably serves a useful ideological function: positing the mobile phone as a technical fix for what are primarily problems of power maldistribution.

The impact of these developments in ICT in Africa, in terms of both ICT development (increased infrastructure and access) and ICT for development (adoption of ICT applications), has been to advance the process of development itself, in terms of ICT for development. The result of this duality of sector transformation has, itself, been dually vast. On the one hand, it has facilitated the delivery of services, such as education, health, better governance (on the parts of both the leadership and the governed), enterprise, and business development, as well as their overall contribution to socioeconomic well-being (especially poverty reduction), political stability, and self-actualization. (Okpaku, 2006, p. 153)

While it was once described as a “black hole” of informational capitalism (Castells, 1998), Africa now has over 620 million mobile phone subscribers, second only to Asia (GSMA & ATKEARNEY, 2011), and it has the fastest-growing mobile phone penetration rate in the world. Many claims are made about mobile phones, with the well-known development economist Jeffrey Sachs arguing that “mobile phones are the single most transformative technology for development” (quoted in Etzo & Collender, 2010, p. 661).

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Some European Union officials claim that new ICTs are “time portals” that will bring modernity to the people of the developing world (Graham, 2011). Mobile phones are also thought to help promote democracy through delivery of voter education (Aker, Collier, & Vincente, 2011), and to reduce corruption (Bailard, 2009). Others argue that these technologies enable economic “catch up” through technological leapfrogging² (Okpaku, 2006), with the President of Rwanda arguing that, because his country missed the agricultural and industrial revolutions, it must take advantage of the information one (quoted in Asche & Fleischer, 2011). However, while leapfrogging may play a role, differential catch-up growth is additionally achieved by leveraging other advantages of late development, based on different cost bases and the nature of social institutions, particularly the state (Guo & Ma, 2010; Wade, 2003). This article explores the direct and indirect causal channels between mobile phones and economic structures in Africa in order to assess how these new technologies may reduce, but also contribute to poverty on the continent.

Much of the literature on the impacts of mobile phones on economic development in Africa share the implicit assumption that the main problem is that Africa has been “by-passed” by globalization (Sachs, 2005). For example Smith, Spence, and Rashid (2011, p. 79) argue that “the benefits of mobile phones might be proportionately greater in resource-constrained settings, e.g. the poor and rural populations. . . . This is particularly true of extreme poverty that results from isolation.” Mobile phones are seen as a potential solution to this problem by connecting the continent, both to the outside world and internally. I refer to these two forms of connection here, heuristically, as spatial articulation (to the outside world) and social articulation (primarily within localities in Africa). However, such claims neglect the ways dependent, as opposed to “independent,” poverty has been structurally and historically produced through colonialism and other exploitative forms of international interconnection

(Carmody, 2011). In other words, it is much of Africa’s type of spatial articulation with the international political economy that is implicated in its underdevelopment, rather than its lack of articulation. An important question is how mobile phones, in particular, change the nature of Africa’s spatial articulation with the global economy.

Connection, in and of itself, is thought of in much of the mainstream literature as something that is necessarily good, capable of ending what former U.S. Secretary of State Colin Powell has called “digital apartheid” (quoted in Graham, 2011, p. 212). The ideology of unmediated international interconnection (neoliberalism) has meant there is a tendency “to portray the mobile phone as an *end*, rather than a *means* to specific social improvements” (original emphases) in much of the literature (Burrell, 2010, p. 232). Likewise, “the concept of universal access carries an implicit theoretical assumption that the key to the successful realization of [an] information society lies in the adequate provision for the widest public . . . ‘access’ to information technologies” (Park, 1997, p. 191). The form that this connection or articulation takes in relation to mobile phones is meant to be through flows of information. However, there are other forms of articulation associated with these technologies which are explored later in this article. In conventional economics, one of the main barriers to economic development³ that has been identified is information asymmetry. Where buyers and sellers have different levels of information, markets are meant to malfunction and “fail” (Stiglitz & Weiss, 1981). Sophisticated quantitative analyses of mobile phone impacts on price dispersion or differences in prices across subnational markets have been undertaken. In “efficient” markets, price equalization or the “law of one price” is meant to prevail—geography is meant not to matter, as information articulation between places eliminates asymmetry. One study found that the introduction of mobile phones reduced price dispersion by 10–16% for grain markets in Niger (Aker, 2010), a reflection of changing

2. Leapfrogging is “bypassing stages in capacity building or investment through which countries were previously required to pass during the process of economic development” (Steinmueller, 2001, p. 194).

3. Development is a notoriously contested term. For the purposes of this article, I adopt Seers’ (1963) classic definition. He argued that when unemployment, poverty, and inequality are decreasing, development is taking place. There are also many definitions of poverty, but for the purposes of this paper, it is defined as living below a minimal socially acceptable standard of living.

power dynamics, although not conceptualized in these terms.⁴

Reduction of price dispersion is a result of the ability of mobile phones to facilitate disintermediation, cutting out intermediaries (middlemen) and allowing direct producers to achieve both a greater reward from the products of their labor, and more efficient arbitrage between different spatial markets. While the former may be true in the case of some workers in the fishing industry, who are able to effect a strategic coupling between mobile information access and product sale, the nature of their work makes them more geographically mobile and able to use their phones to land their catch where they can get the best prices (Jensen, 2007). This is not necessarily the case in other sectors where actors higher up the value chain have more geographic mobility and other sources of power to capture value (see Graham, 2010). While mobile phones hold out the possibility of dramatic reductions in information search costs (de Silva & Ratnadiwakara, 2009), farmers may be locked into forward contracts in order to access inputs, which prevent them from being able to take advantage of higher spot prices (Molony, 2008). Consequently, much of the literature on the impacts of mobile phones on development has tended to be too shallowly "geographical"; focusing on spatial diffusion and connection (the "transfer and diffusion" approach), rather than on the impacts on socioeconomic structures ("the social embeddedness approach") (Avgerou, 2010). Also, many studies neglect the ways the use of mobile phones is structured by other forms of spatial articulation, where one place is not just passively connected to another, but influences the development of the other through trade and other flows, creating trans-localities (Appadurai, 1996).

While Internet and mobile phone convergence is a recent feature of technological development, a new global digital divide may be opening, as the majority of phones sold in Africa are "feature," rather than multifunctional "smart" phones, a result

of cost, limited network capabilities, and widespread illiteracy.⁵ Recently, it was noted that Africa had fewer broadband subscribers than Australia, a country of 21 million people (Smith, 2009).

Much of the literature on closing the digital divide shares similarities with work on the "new" economic geography, which argues that Africa suffers from a "proximity gap" or "trap," as it is too far from rich countries to be able to effectively sell to them (Naude, 2009; Wilson, 2011; World Bank, 2009). However, this literature ignores the fact that it is partly the adverse articulation with the international system (Bush, 2007), rather than physical distance per se, that produces underdevelopment. Relatedly, "the notion of a digital divide has, in many ways, been unhelpful. It has given too much emphasis to the technology [and draws] . . . attention away from other divides and inequalities that hamper development" (Heeks, 2002, p. 7). Mobile phones, by themselves, have no independent causative power. "What do ICTs do? They handle information in digital format. That's all" (Heeks, 2002, p. 2). To understand the impacts of mobile phones on poverty, it is first necessary to interrogate different conceptualizations of poverty, and to think through how the different forms of geographic articulation that mobile phones facilitate influence it.

Conceptualizing Poverty and Mobile Phones

There are three main schools of thought on poverty—the structural, the palliative, and the capability conceptions. The structural conception of poverty examines how it is that poverty is produced (Lines, 2008). It seeks to interrogate the socioeconomic structures that produce inequality, marginalization, and exclusion, rather than assuming these as extant, and then "mopped up" through remedial public action. In this structural conceptualization, then, it is power inequality that produces poverty, as power holders are able to shape

4. However, Aker notes that reductions in information asymmetries are a necessary, but not sufficient, condition for welfare improvements in the context of other market failures, such as poor transportation infrastructure.

5. There are now examples of Web-enabled smart phones for under US\$100 selling quickly in Africa. The Chinese company Huawei's Android smartphone is being sold in Kenya, for example (thenextweb.com, 2011). One potential user wrote in response, "I still can't believe it, finally us students (watu jobless) can get a machine running on Android and at least have something to flaunt about in campus grounds" (Daynis, 2010).

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socioeconomic structures to their benefit and the detriment of others (Oyen, 2004). Taking this perspective, the question in relation to mobile phones is this: How do they reconfigure the nature of power relationships, broadly conceived, including differences in economic productivity? In this conceptualization, poverty elimination depends on structural economic transformation.

An alternative is the palliative conception of poverty, which takes poverty as a given and asks how it can be alleviated or reduced through investment in health and education, for example (Sachs, 2005). Development interventions can have major impacts on poverty reduction (Teklehaimanot, McCord, & Sachs, 2007), and there is no necessary contradiction between palliative and more structural approaches to poverty reduction (Green, 2008)—indeed, both are needed, and they synergize together. However, much of the literature on the poverty reduction potential of new mobile phones fits narrowly within palliation through the delivery of m-health or education—“m-development.” For example, according to Aker and Mbiti:

[A]s telecommunication markets mature, mobile phones in Africa are evolving from simple communication tools into service delivery platforms. This has shifted the development paradigm surrounding mobile phones from one that simply reduces communication and coordination costs to one that could transform lives through innovative applications and services. (2010, p. 208)

However, this neglects how it is that poverty is produced, which is important if it is to be overcome.

A third approach to poverty seeks to understand what social structures inhibit or enhance capability development and fulfilment (see Sen, 1999). If this approach is adopted, the questions might be these: How it is that mobile phones enhance capabilities (what people are capable of doing), and how may they change social structures that influence or inhibit these capabilities? At first, the capability approach appears to achieve a reconciliation between palliative and structural conceptions of poverty, with Sen explicitly stating that his framework draws on the work of both Karl Marx and Adam Smith (Clark, 2006). However, the unit of analysis of the capability approach is the individual, and consequently, the approach still suffers from an ethical, if not ontological, individualism (Hill, 2007).

This tends to obscure issues of class power and, in particular, the class nature of the state (Jessop, 2002), which is charged with implementing policies to overcome poverty. Consequently, an approach that interrogates how mobile phones change socioeconomic structures enables a more accurate assessment of their poverty reduction and economic developmental potential and impacts.

Interestingly, the palliative and structural conceptualizations share some implicit similarities in their emphasis on flows (spatial articulation) between places as primary drivers of (under)development. In the palliative conception of poverty, which fits with the neoliberal project, interconnection and flow promotion will accelerate development. Liberalization and unrestricted trade are to be promoted, and increased aid flows will “end poverty.” The justification for aid is that, while the free market is beneficial, aid can accelerate growth and development beyond what would occur under a completely *laissez-faire* regime, particularly when countries are caught in poverty and other traps (Collier, 2007; Sachs, 2008). In contrast, structuralists argue for the need to regulate international flows to allow for infant industry protection, endogenous technological development, and a reduction of surplus extraction through overseas debt repayments, for example (Noman, Botchwey, Stein, & Stiglitz, 2012). These two approaches are characterized heuristically in Figure 1.

Both perspectives have elements of truth to them. Some elements of the neoliberal articulation package (trade, foreign investment, new ICTs, and aid) can be beneficial for development. However, whether poverty reduction or reproduction results depends on the way in which trade and the other elements of the package are structured as a result of (class and state) power relations and the path dependency of previous economic structures. Current global power relations arguably favor structuralist outcomes—the reproduction, rather than reduction, of poverty—at least in Africa, where foreign investment is heavily concentrated in natural resource extraction, and the absolute number of people living in poverty continues to rise (United Nations Conference on Trade and Development, 2010).

The ability of mobile phones to help change the nature of African economies, and consequently, the depth of poverty on the continent, depends on

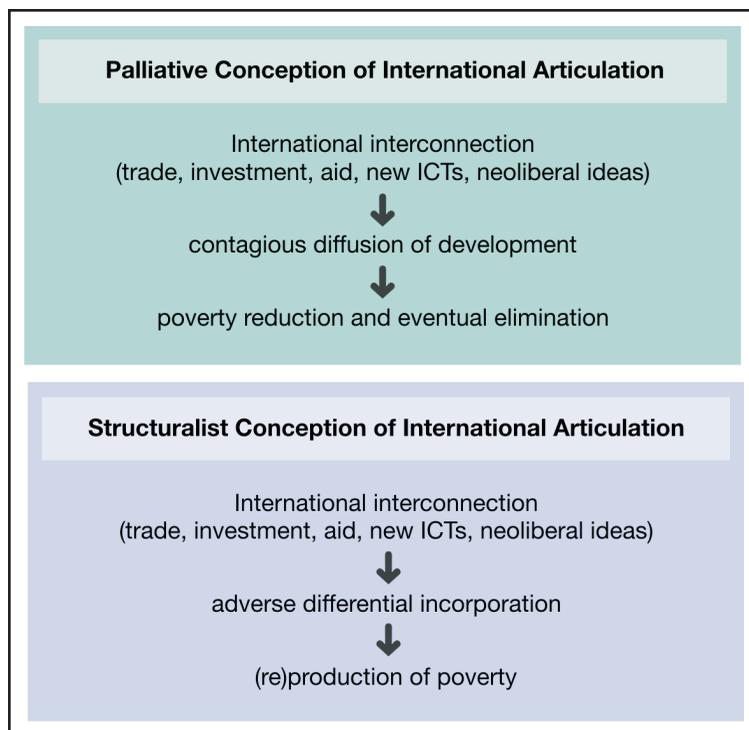


Figure 1. *International Articulation.*

the extent to which they result in market creation, widening, and deepening. However, mobile phones might simply put some (overseas) firms at a competitive advantage relative to others, resulting in a fallacy of composition, where the growth of some firms is the concomitant of the closure of others, and poverty levels remain the same or worsen.

Partly, the answer to the above quandary depends on the extent to which mobile phones put African-based firms at a competitive advantage relative to their overseas competitors. There is no reason to think that this should be the case. Indeed, given higher levels of development in other world regions and, consequently, more conducive complementary conditions and factors of production, such as better transportation infrastructure, it is likely that, if anything, new ICTs actually put firms elsewhere at a relative competitive advantage. While mobile phones can substantially reduce transaction costs (de Silva & Ratnadiwakara, 2009), “death of distance” arguments about them tend to underplay the continued

importance of face-to-face communication for tacit knowledge transfers, for example (Bathelt & Turi, 2011). This knowledge transfer mechanism favors more developed regions with more (business- and innovation-related) tacit knowledge (Amin & Cohendet, 2004).

Mobile Phones and Poverty Production

Much of the literature on information and communication technology for development (ICT4D) focuses on how ICTs enable socioeconomic connection or articulation and, thereby, almost axiomatically, reduce poverty. However, ICTs may also be implicated in the production of poverty. Fuchs and Horak (2008, p. 101) note that “unequal patterns of material access, usage capabilities, benefits, and partici-

participation concerning ICTs are also due to the asymmetric distribution of economic (money, property), political (power, social relationships), and cultural capital (skills).” Consequently, mobile phone accessibility and impacts cannot be analyzed in isolation from pre-existing socioeconomic structures and power relations, which they may serve to reinforce, but also subvert.⁶ Mobile phones, then, may serve as tools of domination, exploitation, cooperation, or popular empowerment. They are embedded in existing social relations of social support, resource extraction, and conflict, while also helping to reconfigure and reconstitute them (Carmody, 2010). Power fundamentally structures how mobile phones are used, for either progressive or regressive ends (Castells, 1999).

There is an extensive literature on ICT4D (i.e., how ICT can be used for development interventions; e.g., Unwin, 2009). While many of the benefits of mobile phones for poverty reduction have been noted, the ways in which they may contribute to

6. According to Fuchs (2010, p. 194), “informational capitalism is an antagonistic system that by transnationalization and informatization produces at the same time new potentials of class domination and class struggle.” According to Fuchs, it may create a cybertariate, such as those engaged in microwork in Kenya, for example.

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poverty production have been largely ignored. According to Tim Berners-Lee, the inventor of the World Wide Web, mobile phones can be like a “drug” in the developing world [and elsewhere], as people feel they need to spend income they sometimes cannot afford to have them.⁷ This is partly because they are “positional goods,” showing social status, but they also make people feel included, rather than excluded, from processes of globalization (Hahn & Kibora, 2008).

There are also instrumental reasons for their use—the maintenance and nurturing of survival networks. There are instances in Africa—in the Millennium Villages, for example—where people have chosen to spend money on mobile phone credit rather than school fees for their children (Puri et al., 2010). Consequently, mobile phones may, at times, be implicated directly in the production of poverty. In Ethiopia, the poorest 75% of the population who use mobile phones spend 27% of their income on them, reflecting “the continued high cost of services on the continent” (Gillwald & Stork, 2008, p. 14). The willingness of people to pay such high proportions of their income for those services reflects the social and economic utility that these devices provide. However, whether this utility reflects opportunity or fears of exclusion (and hence, compulsion) varies.

A study in Uganda quotes a respondent that “mobile phones bring poverty” (Diga, 2007a). In rural Uganda, Diga (2007b, p. 63) found that “one man stated that without a mobile phone he was missing opportunities for work, as employers would first contact those with mobile phones. The mobile phone had thus become a necessity for this man involved in casual labour work.” We might think of this as “negative adoption,” which can explain the fact that some people have mobile phones, even if they find them expensive to run. The costs of exclusion from social networks would be too great to not have them.

Diga also found that most of the homes in her study had reduced their purchases of store-bought groceries to pay for airtime. According to one

woman in reference to her husband, “he would rather not buy us food but he would rather put airtime on the phone because it is the phone that makes money” (quoted in Diga, 2007b, p. 66). Diga found that people, often women in particular, were willing to sacrifice consumption to invest in mobile phones for small business development. These trade-offs show that mobile phone adoption is then driven by a dialectic of “poverty push/opportunity pull.” However, market size is limited, so in addition to winners, there will be losers for whom poverty will increase as a result of this competition.

Mobile phones may also (re)produce poverty in other ways. The following list is indicative, rather than exhaustive.

- Perpetuation of technological dependence and underdevelopment, as mobile phones and associated infrastructure are developed and imported from elsewhere.
- Capital leakage for infrastructure, such as base transceiver stations, phones, and mobile credit. For example, if the average cost of importing mobile phones is US\$15 per handset, 620 million new handsets would represent a capital loss of almost US\$9 billion per handset turnover time.⁸ Imports of office and telecommunication equipment for the 32 countries in Africa for which data are available were US\$18 billion in 2009 (calculated from WTO, 2011).
- Direct income depletion: “In Niger, the cost of a one minute call off-network is US\$0.38 per minute, representing 40 percent of a household’s daily income” (Aker & Mbiti, 2010, p. 227).⁹ Research among university students in Tanzania found that they were spending five times more on mobile phone connectivity than they were on food (Kleine & Unwin, 2009).
- Sourcing of the mineral ore coltan, necessary to make the electrical capacitors in mobile phones, is implicated in the conflict in the Democratic Republic of Congo, leading to poverty (Nest, 2011; Nest & Grignon, 2006).

7. Keynote address at ICTD Conference, Royal Holloway, University of London, December 14, 2010.

8. Some handsets are, of course, more expensive, and others are cheaper than this, and a small number of mobile phones are also assembled in Africa.

9. Research ICT Africa found in a recent survey that Niger was the 12th most expensive African country in which to purchase airtime, which may relate to the relative lack of competition in the country.

- Disintermediation may lead to poverty among traders.
- Mobile phone-enabled firms may capture business from those that are not, contributing to poverty for their owners, managers, and workers. While this may mean that more technically efficient firms grow, raising economic growth, this also has implications for poverty through the concentration of capital, potentially raising inequality and thereby making markets narrower. The poverty elasticity of economic growth may be reduced.
- Mobile phones can facilitate increased import penetration into African economies, subjecting domestic manufacturers, in particular, to competitive displacement pressures (Meagher, 2007).

Multicountry studies across Africa have shown that mobile phones are used primarily to maintain social networks or social articulation. Although they are also used to maintain “weak links” to business associates (Miller et al., 2005; Molony, 2007; Souter et al., 2005). According to Slater and Kwami (2005), mobiles are primarily used to manage local embedded reciprocities. Rather than being used to connect to the “global economy,” the majority of calls in Ghana, for example, are “used to maintain family relations” (Slater & Kwami, 2005), and in that way may be regarded as socially articulating or linking,¹⁰ but not productively economically articulating to global production networks (GPNs). This is elaborated upon further below.

Adoption may then often represent part of a defensive livelihood strategy, given widespread poverty and the importance of extended family networks to survival (Rettie, 2008). In common with many other studies, one in Tanzania that surveyed several thousand households found that, while the majority of respondents felt mobile phones had strengthened their social networks, more than half did not think mobile phones had increased their household income (Sife, Kiondo, & Lyimo-Macha, 2010). In contexts of extreme poverty, social networks are vital to survival, and mobile phones represent important tools to strengthen these networks of extended family and friends. In Botswana, “the

purpose of calls was recorded as predominantly to friends and family (70%), a proportion of which concerned arranging financial remittances” (Duncombe, 2006, p. 94). Mobile phones also change and reinforce pre-existing economic structures, which influence poverty, to which we now turn.

The Structure of the Information(alized) Economy in Africa

Some have argued that the information economy is itself a new mode of production. For example, Benkler argues the following:

[A]s the material barriers that ultimately drove much of our information environment to be funnelled through the proprietary, market-based strategies is removed these basic nonmarket, non-proprietary, motivations and organizational forms should in principle become even more important to the information production system. (2006, p. 4)

The networked information economy appears to be relatively weak in Africa, as there is little research and development of ICT and software applications (Ya’u, 2005), with some notable exceptions, such as the Otigba computer hardware cluster in Nigeria (Oyelaran-Oyeyinka, 2007) and the new iHub in Kenya, where many innovative mobile phone applications have been developed (African Brains, 2011). There have also been some innovative applications developed, such as m-Pedigree and Simpill in South Africa, which sends a text when a patient opens their pill bottle, and reminds them if they don’t (Radelet, 2010). Outside of applications such as these, however, there is very little research and development activity in the information economy proper in Africa, such as the development of new hardware and software, where much of the value addition takes place. The issue may be partly one of time, as new technological development becomes embedded.¹¹ It should be noted, though, that this may be limited by resources, as Africa’s most innovative economy, South Africa, has less than 20% of the number of researchers per thousand people employed as in the Organisation for Economic Co-operation and Development countries (ISO, 2009;

10. Another way to conceptualize this would be as strengthening “bonding” social capital (Putnam, 2000).

11. I am grateful to Chris Benner for this point.

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OECD, 2009). The continent continues to be characterized by technological underdevelopment (Timamy, 2007), despite substantial latent innovative potential (Muchie, Gammeltoft, & Lundvall, 2003). Consequently, as has been argued elsewhere, current modes of African incorporation into the global information economy constitute a form of thin integration (thintegration), one where Africa is primarily imbricated in global ICT value chains through imports of mobile phones and other technology, with natural resources serving as the primary counterflow (Carmody, 2010).¹²

There are successful indigenous mobile phone companies, such as South Africa's MTN (Mobile Telephone Networks), which directly employs 6,000 people worldwide and pays substantial tax revenue. However, according to the Nobel Prize-winning economist Joseph Stiglitz (2010), companies such as MTN are "mining" poorer countries of their income. MTN, for example, now earns most of its profits in West Africa, rather than Southern Africa, with Nigeria being a particularly important market (MTN, 2009), despite the much lower average incomes in West Africa.

It is estimated by the World Bank that the mobile phone industry has created 3.5 million jobs in Africa, largely in low-productivity and low-profit activities, such as selling mobile phone credit (Bhavani, 2008). As the marginal productivity of labor is low in these activities, as is the scope for innovation, structural diversification is limited. Mobile phone credit sellers represent a new hybrid (in)formal economy in Africa, as they work in the "unregulated," or popular economy, but are articulated to the formal economy through purchases of mobile scratch cards. Mo Ibrahim (2011) refers to them as "indirect employees" of his former company Celtel, although in a structure not necessitating the company to pay payroll taxes and social insurance, thereby undermining the possibilities of a tax and accountability bargain between citizens and the state,¹³ replicating previous incentives around (poor) governance on the continent (Leonard & Strauss, 2003).

The literature on the diffusion of mobile phones

in Africa has concentrated on the demand side almost exclusively, while sometimes noting the fact that the mobile telephone is an "inverse infrastructure" that is largely self-organizing and does not require huge fixed investments, unlike roads or an electrical grid (Egyed, Mehos, & Vree, 2009). However, on the supply side, their spread has been facilitated precisely by conditions of informality and state weakness in infrastructure delivery, conditions which must be transcended for there to be development. Mobile phones then have contributed to the growth of the informal sector through employment creation in selling credit, repairing phones, etc., which is beneficial in terms of new livelihoods, but problematic in terms of its longer-term development impacts (Meagher, 1995).

While mobile telephony may be helpful to certain informal sector enterprises, the sale of credit to poor populations working in the informal economy could also be regarded as an example where the formal sector is extracting social surplus from the informal sector—adverse articulation, or exploitative functional dualism (Mhone, 1982), between the two "circuits" of the economy (Santos, 1979). Other potentially disadvantageous articulations are also being inscribed, as Celtel was bought out by a Kuwaiti company in 2005, replicating previous patterns of economic extraversion.¹⁴ Income is flowing up the global social value chain, from those in the informal sector in Africa buying mobile phone credit to international stockholders, such as Sunil Mittal, the sixth richest person in India, who now holds a majority stake in the renamed company, Bharti Airtel (*Forbes*, 2011; *Times of India*, 2007).¹⁵

Perhaps, from a developmental perspective, the most important question concerns the indirect impacts of mobile phones on other sectors of the economy, outside the information economy proper. According to Esselaar, Stork, Ndiwalana, and Deen-Swaray:

During the hype of the dot.com bubble in 2000, there was a general perception that the provision of ICTs to SMEs . . . would have a transformative effect. Clearly the current view is more pragmatic.

12. One academic estimates that up to 20% of sub-Saharan Africa's phones pass through one housing complex in Hong Kong called *Chungking Mansions* (Shadbolt, 2009), with many of them being retrofitted (fake) models.

13. This is ironic, given the Mo Ibrahim Foundation's focus on governance.

14. This came about despite the fact that Ibrahim was living in London at the time and had sourced capital for Celtel from such international private equity groups as *Emerging Capital Partners*.

15. In a sense, the change in ownership may make little developmental difference, as both Ibrahim and Mittal are members of the transnational capitalist class, who are based, for the most part, outside of Africa (Sklair, 2001).

ICTs are now supported for the catalytic role that they can play within sectors of the economy. (2007, p. 98)

There are many examples of the informationalized economy in Africa: For example, the Song-Taaba Yalgré women's organization in Burkina Faso exports shea butter and sells over 90% of its output over the Internet. Its members use mobile phones and global positioning systems to "track locations, surface area, numbers of trees, and other field data to harvest shea butter [sic] more effectively" (Radelet, 2010, p. 109). To more fully understand the economic impacts of mobile phones, however, it is helpful to develop a typology.

Typologizing the Economic Impacts of Mobile Phones in Africa

A variety of typologies have been developed to explain the impacts of mobile phones on development in Africa. For example, per Aker and Mbiti:

[We] identify five potential mechanisms through which mobile phones can provide economic benefits to consumers and producers in Sub-Saharan Africa. First, mobile phones can improve access to and use of information, thereby reducing search costs, improving coordination among agents, and increasing market efficiency. Second, this increased communication should improve firms' productive efficiency by allowing them to better manage their supply chains. Third, mobile phones create new jobs to address demand for mobile-related services, thereby providing income-generating opportunities in rural and urban areas. Fourth, mobile phones can facilitate communication among social networks in response to shocks, thereby reducing households' exposure to risk. Finally, mobile phone-based applications and development projects—sometimes known as "m-development"—have the potential to facilitate the delivery of financial, agricultural, health and educational services. (2010, p. 214)

Another way to evaluate the impacts of mobile phones has been developed by Heeks and Jagun (2007), who argue that these impacts fall into three categories: 1) incremental (improving the speed and efficiency of what people already do), 2) transformational (creating something new), and 3) production-related (selling mobile phones and related services).

The examples of transformation that are often given relate to the provision of new services, such as m-health or m-banking, which some claim have the potential to be "transformational" (Smith, Spence, & Rashid, 2011, p. 81). However, as noted earlier, economic transformation is a more multifaceted and complex process than simple service delivery, and it involves new, more productive forms of international articulation in particular. Consequently, to explore whether mobile phones facilitate this, an alternative typology on their economic impacts is proposed below:

1. Direct impacts of the production of mobile phones, in terms of sourcing of raw materials, production, marketing, and sales (the mobile phone hardware value chain);
2. Business opportunities in the information and virtual economies, such as the development of mobile applications, and ancillary activities, such as mobile phone credit sale and phone repair;
3. The impacts of mobile phones on productivity in other sectors of the economy; and
4. Indirect economic impacts through education, health, and other service provision.

The first two of these can be encompassed under the idea of mobile phone GPNs (Hess & Coe, 2006). In this respect, it is useful to draw a distinction between the information economy, which is ICT-driven, and the informationalized economy, where other economic sectors use new ICTs. Given the weakness of items 1 and 2 in Africa, and the limited economic impacts of item 4, it is the nature of the informationalized economy that is most important.

The informationalized economy has differential depth to it, depending on the embeddedness, intensity, and interconnection in the ways in which mobile phones and other new ICTs are used. As most of the world's poor work in the small- and medium-sized enterprise (SME) sector (Lourenço-Lindell, 2010), including agriculture, perhaps the most important question about the impacts of mobile phones on development and poverty concerns how they affect the productivity, business strategies, exports,¹⁶ and consequently, the growth potential of SMEs. Some argue that it is this "popular economy" that is the real economy in Africa,

16. Although, the international market is limited, so the fallacy of composition comes into play. It is not possible for all SMEs to gain international market share.

because it is where the majority of people work. Consequently, in an African context, what is particularly important is the impact of mobile phones on the informal sector, including peasant agriculture.

Some studies imply that the introduction of mobile phones represents positive, rather than zero-sum games:

(Aker, 2008) . . . finds that the introduction of mobile phones is associated with increased trader and consumer welfare. The introduction of mobile phones led to a reduction in the intra-annual coefficient of variation, thereby subjecting consumers to less intra-annual price risk. Mobile phones also increased traders' welfare, primarily by increasing their sales prices, as they were able to take advantage of spatial arbitrage opportunities. The net effect of these changes were an increase in average daily profits, equivalent to a 29 percent increase per year. However, the effects of mobile phones upon farmers' welfare were not measured. (Aker & Mbiti, 2010, p. 218)

However, a reduction in intra-annual price variability is not the same as an overall price reduction, and if the majority of the population are primarily farmers, lower food prices may reduce their welfare. In this study, the only indisputable beneficiaries were the traders, a result that is the obverse of the intended impact of mobile phones on markets.¹⁷ Mwakaje found that "the few farmers who used ICTs to access markets were mainly those who produce large quantities of crops or have crops that are in great demand" (2010, p. 123), and that "farmers with high income had more than one ICT . . . and therefore were in a better position to access market information through these items than those with less income" (ibid., p. 121), thereby contributing to increased inequality and narrowing markets.

Fundamental to the economic developmental impacts of mobile phones is how they link people and places. Do mobile phones fundamentally change either the nature of interconnection between more distant people and places or power relations between them, or do they reinforce them?

Mobile Phones and (Dis)Articulation

Writing in the early 1980s, the agricultural economist Alain de Janvry (1981) developed his ideas

about the political economy of development using the concepts of articulation and disarticulation. His central idea was that economic underdevelopment resulted from social and sectoral disarticulation, which were linked. Whereas, in developed countries, there was a developed capital goods sector that provided inputs to and demand for the consumer goods sector (sectoral articulation) and the working class had mass purchasing power to buy the products of industry (social articulation), this was not the case in the underdeveloped world. There, he identified two types of economies—export-oriented and import-substituting disarticulated ones.

Over the last three decades since de Janvry's seminal book was written, globalization has changed this configuration somewhat, even as the core-periphery structure of the global economy has remained substantially intact (Grasland & Van Hamme, 2010). Partly facilitated by new ICTs and liberal global capital and trade regimes, new GPNs have emerged (Coe, Hess, Yeung, Dicken, & Henderson, 2004). This, in turn, has created a new pattern of "network trade," where final products contain components manufactured in many countries (Broadman & Isik, 2007).

For some, these new forms of spatial articulation have resulted in the world becoming "flat," as new ICTs allow information processing and other activities to take place, potentially, virtually anywhere in the world (Friedman, 2005). Regional development tends to exhibit a long-lived path dependence (Neffke, Henning, & Boschma, 2011), however, and others have noted an accentuation of uneven global development (Jomo & Baudot, 2007). Sub-Saharan Africa (SSA), in particular, continues to receive relatively little inward foreign direct investment in manufacturing and services, and around three-quarters of what the subcontinent exports is unprocessed primary commodities (Bond, 2006). Thus, for the most part, the countries of SSA can be characterized as export-oriented disarticulated economies. Are mobile phones fundamentally changing this?

The answer to this question would appear to be no, as there is no evidence of structural diversification in Africa's exports. In fact, the reverse seems to be happening. For the 39 African countries for which data are available in the WTO's statistics database, the proportion of exports accounted for by

17. A survey by a World Bank researcher in Bolivia found that 70% of respondents did not think that Internet access had any impact on people's economic well-being (Gigler, 2011).

agricultural products, fuel, and minerals actually rose from 69.4% in 2000 to 71.3% in 2009, and there was a roughly corresponding drop in the proportion of total exports accounted for by manufacturing (calculated from WTO, 2011). Some have argued that, as a result of increased resource dependence in exports, there has actually been a technological downgrading of African economies (Economist Intelligence Unit, 2002), despite the much-vaunted “mobile phone revolution.”¹⁸ This (neo)colonial trade structure reproduces, rather than substantially reduces, poverty (Carmody, 2011).

Conclusion

The failure of neoliberalism in Africa led to its reinvention through the use of a variety of concepts, such as governance and social capital, over the last number of decades (Carmody, 2007). The continued failure of market reforms was blamed on a lack of social capital or poor governance, while the economic bases of the policies themselves were not questioned, at least by the development institutions promoting them. More recently, Africa’s physical geography has been used by such development institutions as the World Bank to “explain” the continent’s underdevelopment (Carmody, 2011). The posited solution is to reduce distance from rich parts of the world through the elimination of tariff barriers and investment in infrastructure. As the self-proclaimed “knowledge bank,” the World Bank knows what to do.

Much of the literature on the impacts of mobile phones in Africa fits into the modernization paradigm, which sees development occurring as a result of processes of contagious diffusion from richer to poorer parts of the world. This technoliberal boosterism, where there is conflation of information technology with markets and democracy, does little to address the fundamental structural problems of African economies. While World Bank researchers argue that Africa is now being propelled into cutting-edge transnational production networks (Broadman & Issac, 2007), there is little evidence from the macro trade statistics or micro-level analysis that this is happening on a substantial scale (Carmody, 2010).

Africa remains characterized by technological dependence across a range of sectors, including mobile telephony. While these new technologies do have poverty reduction benefits and potentialities that could be realized through the unlocking of capabilities, they do little to substantially raise productivity or economic diversification, as shown by the trade statistics.

What about the impacts on capabilities that improve survivalist livelihood strategies? According to Amartya Sen, evidence suggests that successful development can best be achieved by involving a

wide dissemination of basic economic entitlements (through education and training, through land reform, through availability of credit [and thereby broaden] access to the opportunities offered by the market economy. (2001, p. 183)

Alampay writes, “Viewed in this way, it implies that access to ICTs does not necessarily lead to development unless other entitlements are provided” (2006, p. 12). However, entitlements are not costless, and a productive economic structure is needed to generate the resources to pay for them. Furthermore, economic upgrading and diversification require more than access to entitlements. They require an active government strategy to build competitive advantage and deepen markets in the manufacturing and service sectors, in particular (Rodrik, 2008). The reduction of information asymmetries alone cannot substitute for that.

As Graham argues, “complex articulations are emerging between interactions in geographical space and place, and the electronic realms accessible through new technologies” (1998, p. 172). However, in much of the literature, there is an intellectual disarticulation between the spread of mobile phones and their supposed impacts. Africa is incorporated into the global technological revolution primarily in a dependent manner—as an importer, rather than producer of technology. The main benefit of mobile phones in Africa is the greater access to information and communication they allow. However, to expect them to develop countries or regions is to overload their impacts. Other structures of economic production and flows of trade and investment are much more important in

18. *Increasing resource intensity in the export structure has been driven by both demand for Africa’s natural resources and competitive displacement pressures on manufacturing arising from competition with Chinese products, in particular* (Kaplinsky, 2008).

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achieving that, and these are fundamentally structured by power relations.

Mobile phones do arguably result in “disruptive [social] transformation” (Avgerou, 2010), but the continent is becoming an informationalized agrarian, resource extractive, and informal economy produced through economic extraversion (Abrahamsen & Williams, 2011), rather than a knowledge economy. Mobile phones have then been absorbed into, but have not transformed, economic structures in Africa. In fact, these inequitable structures produce poverty, as do mobile phones for many less powerful, if not quite powerless, people, when mobiles are inserted into the structures. Only developmental states in Africa can leverage the positive developmental potential of mobile phones and other new ICTs to achieve wider economic transformation. Much of the literature on the developmental impacts of mobile phones in Africa is neoliberal in inspiration, but it is only when neoliberalism is transcended that real development on the continent will take place (Soludo, Ogbu, Osita, & Chang, 2004). ■

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