Development Paradigms & African Digital Innovation:

The Cage of New Institutional Economics

Dr. Laura Mann

Assistant Professor

International Development Department/Firoz Lalji Centre for Africa

London School of Economics and Political Science

(and co-author, Gianluca Iazzolino, Research Associate, ID/FLCA, LSE)

LSE THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Email: l.e.mann@lse.ac.uk

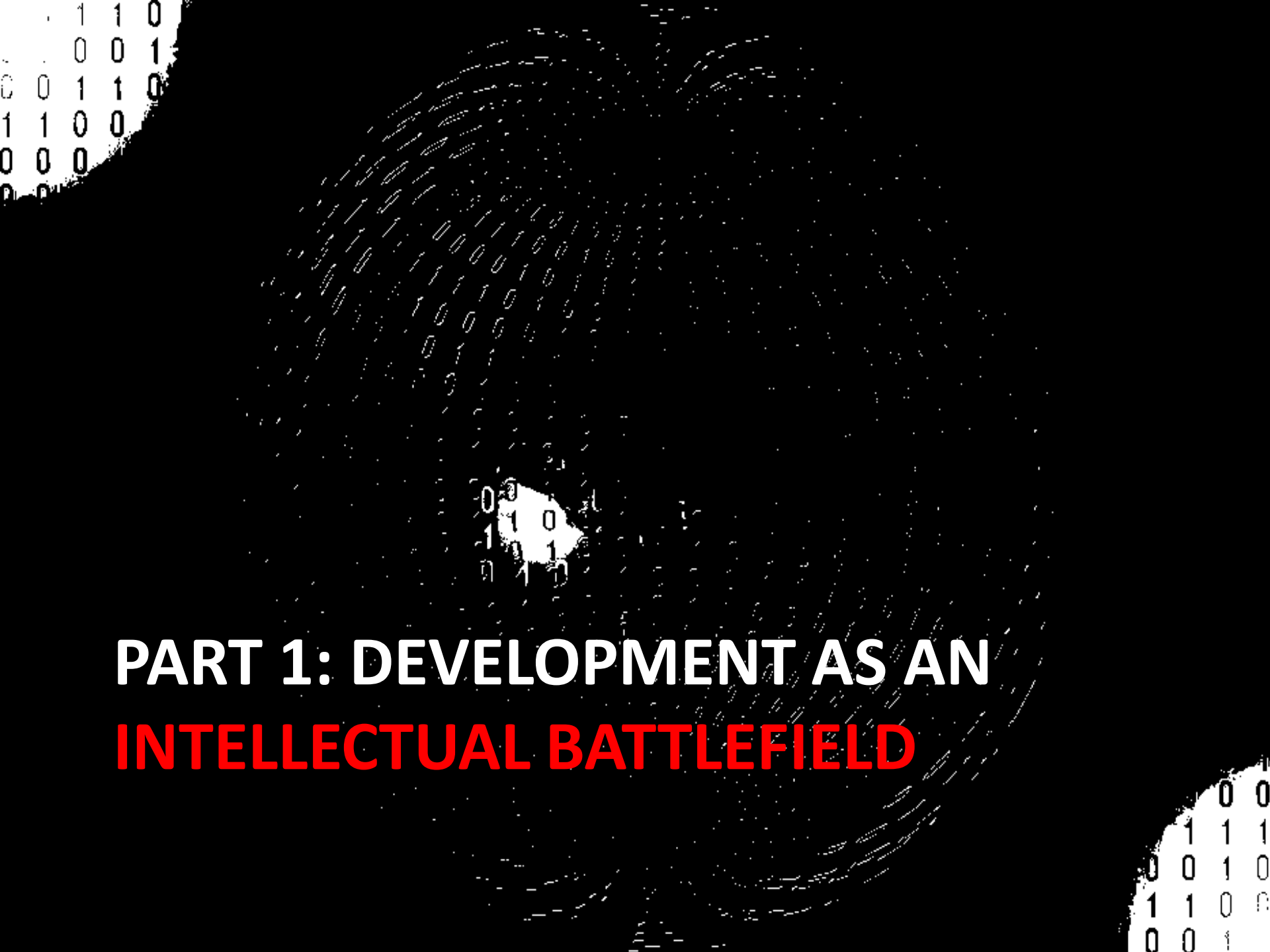
Twitter: @balootiful

3 key arguments:

1. Development as an **intellectual battlefield**.

2. African Digital discussions are **stuck in a 'NIE cage'**.

3. A more heterodox perspective: ICTs as **platforms for competitive commercial R&D**.



PART 1: DEVELOPMENT AS AN INTELLECTUAL BATTLEFIELD

Knowledge impacts upon economic development and global competition in two ways:

First knowledge can make economies more competitive in existing areas of production through knowledge acquisition and technology transfer.

Second, knowledge can help move countries out of fierce competition in commodity production into new activities with higher barriers to entry. I.e. capturing knowledge rents through R&D and commercialisation.

"Effective insertion into global export markets offers the potential for sustainable income growth. … **The key to achieving the beneficial outcomes lies in the capacity to identify, appropriate and protect rents, and in the context of intense global competition, to develop the capacity to master dynamic capabilities in order to generate rents on a sustainable basis. [A] major category of rents are those that are created by producers, increasingly through the systematic application of knowledge to production.**" (Kaplinsky and Morris, 2016: 626 and 626).

"Most importantly, industrial policy involves incentivizing and assisting firms and farms to build their **technological capabilities through acquiring new technologies and investing in learning how to use them efficiently**" (Whitfield et al., 2015: 33).

(see also Sutton et al., 2016; Oqubay, 2015 UNECA, 2016).

(see also OECD; Naude, 2010; Sutton, 2010; Greenwald and Stiglitz, 2013; Mazzucato, 2015; Shimada, 2015; Newman et al., 2016: 85-154).

Some have described this change as bringing about an **'industrialisation of freshness'** (Cramer, 2015) while others such as Carlota Perez have suggested that resource-rich economies within Latin America and Africa might be able to use their rich natural resources **to develop their own geographical-cum-technological barriers to entry within the global economy** (Perez, 2015; Whitfield et al., 2016).

Renewal of the development process depends on ***reinvesting the 'knowledge surplus' into broad-based productivity and back into further knowledge production…***

The struggle over the technological surplus is not just a competitive struggle between countries but also to a certain extent, ***a struggle between public funders of science and innovation and the private firms that commercial that science*** *(Mazzucato, 2015).*

Development is an **intellectual battlefield** in a second sense;
that mainstream policy **paradigms have been subject to epistemic contestation** over time.

	Independence Era	1980s- 1990s	1990s onwards	Mid 2000s onwards
Economic Policy	Productivist/structuralist: strong emphasis on Industrialisation	Neo-liberal: Getting the prices right	New Institutional Economics: Getting market institutions right	Growing heterodoxity: Re-emergence of industrial policy (although debate).
Social Policy	Universal	Limited	Residual/ targeted	Transformative agenda re-emerging but institutionally fragmented (many NGOs).
Higher Education Policy	Linked to economic planning.	WB denunciation of HE funding. The case for liberalisation for both financial and social reasons.	Renewed emphasis by WB but very donor-driven and institutionally fragmented.	Domestic support returns but still institutionally fragmented.

Mkandawire (2014: 179) asks: do we inhabit an open 'marketplace of ideas' in which ideas merely emerge from the economic reality of the time or do we inhabit a rigged marketplace in which those with influence and financial power are able to shape the research agenda and developmental paradigm in relation to their own ideas and interests?

PART 2: THE NEW INSTITUTIONAL ECONOMICS PARADIGM AND AFRICAN DIGITAL ECONOMIES.

	ICT4D research	Examples of software/apps
Transaction Costs	• **Olumoye, 2018**, "integrated e-Government implementation in Nigeria; • **Wenner et al., 2017**, Organizational models of mobile payment systems in low-resource environments • **Alam and Wagner, 2016,** "The Relative Importance of Monetary and Non-Monetary Drivers for Information and Communication Technology Acceptance in Rural Agribusiness" • **Boateng, 2014**, "Resources, Electronic-Commerce Capabilities and Electronic-Commerce Benefits: Conceptualizing the Links" • **Baro and Endouware, 2013,** The Effects of Mobile Phone on the Socio-economic Life of the Rural Dwellers in the Niger Delta Region of Nigeria	• **G2P payments:** "Bourse Familiale" (Senegal), SAGE (Uganda); • **P2B payment services**: Kopo Kopo (Kenya); BambaPos (Kenya). • **B2B payment service:** Cellulant, ConnectAfrica (Kenya) • **P2P payments**: Nomanini (Kenya), designed to facilitate transfers in the informal economy; Forex, Eastpesa, to perform cross-border payments in East Africa; Bitpesa (Kenya), Blockchain-based money transfer service • **Aggregators for bulk payments**: InTouch (Senegal), Yo Uganda (Uganda) • **Early arguments about possibilities of Business Process Outsourcing** ('flat earth' and 'global opportunities'
Information Asymmetries	• **Furuholt, 2018,** "The role telecentres play in providing e-government services in rural area"; • **Qureishi, 2017**, The forgotten awaken: ICT's evolving role in the roots of mass discontent • **Riggins and Weber, 2017**, "Information asymmetries and identification bias in P2P social microlending; • **Kampenhout, 2017,** There is an app for that? The impact of community knowledge workers in Uganda; • **Islam and Gronlund, 2011**, Bangladesh calling: farmers' technology use practices as a driver for development; • **Aker and Mbiti, 2010,** Mobile Phones and Economic Development in Africa;	• **M-Cow (Kenya)** provides relevant information (on market prices, weather, livestock and crop health) to farmers; • **Abacus (Kenya)** helps local and international investors get information about business opportunities in Kenya; • **Jumo (Kenya)** allows several SMEs to share behavioral data from mobile usage to create financial identities; • **Tala (Kenya)** provides customer credit scores to financial institutions. • **Arguments made about digitizing auction (as in tea, flower and coffee) and marketing boards.**
Property rights	• **Mulalu and Veenendal, 2015**, "PGIS Based Land Information Mapping and Map Updating to Support Rural Community Knowledge Building" • **Tamowke, 2012,** "Property Rights-Based Analysis on Cybercafés Offerings with Data from Cameroon" • **Duvail et al., 2006,** Participatory Mapping for Local Management of Natural Resources in Villages of the Rufiji District (Tanzania)	• **GhanaPostGPS** - Ghana's official digital property system • **Bitland (Ghana)** Blockchain-based registration system; • **MAST (Mobile Application to Secure Tenure)**, USAID-initiative currently deployed in Tanzania and Zambia; • **Kadaster (Jordan)**, an initiative to digitize land records; • **Aadhard (India)**, a large scale biometric identification system to provide all Indian citizens with an ID number linked to biometric indicators and incorporated into

*There is much less attention to the potential roles that ICTs might play in reducing **production costs**. In fact, ICTs have **often been positioned as technologies that can 'leapfrog' other infrastructural deficits** like transportation and electricity infrastructure.*

*Yet African countries will **absolutely need to build strong transport and electricity infrastructures** if they want to reduce production costs and seriously compete within the global economy. **Increasing market efficiency and assuring property rights will only get you so far** (See Murphy and Carmody, 2015; Foster et al., 2018).*

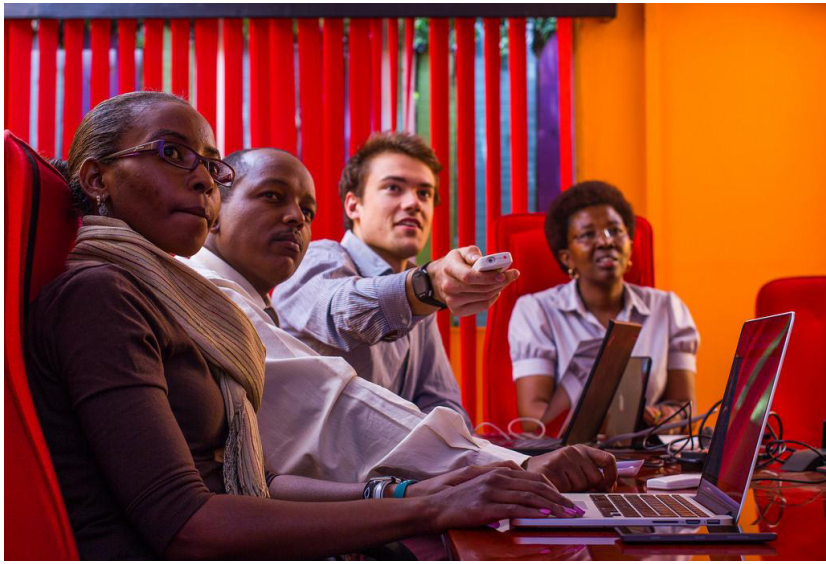
*Further, the NIE perspective does not help us think strategically about the **role of ICTs within the knowledge economy.***

WHY THE NARROW FOCUS ON NIE?

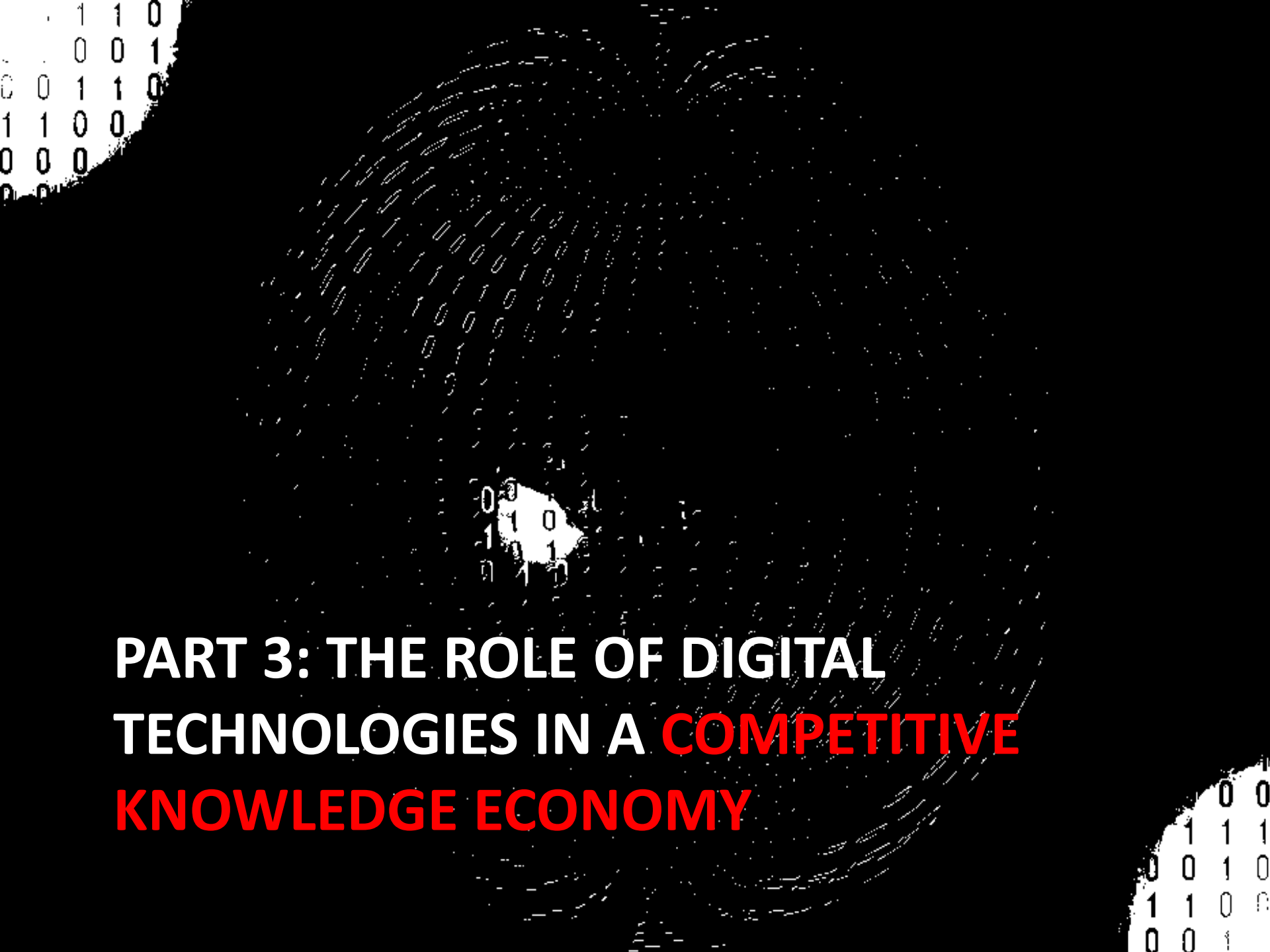
1. Much research funding is **driven by commercial interests of tech firms** like Facebook, IBM, Mastercard, and Visa who have an interest in focusing attention on NIE issues (see Mann, 2018).

1. The **donor community remains an important consumer of digital innovation** and their approach to economic growth and social policy remains less heterodox and more residual.

1. **Popular appeal of the Silicon Valley culture** among tech developers and perhaps a limited understanding of the context in which many digital innovations within the US emerged (i.e. from federally funded labs). See Block, 2011; Weiss, 2014; Mazzucato, 2015).



IBM Research - Africa Scientists at Riara School, Nairobi.

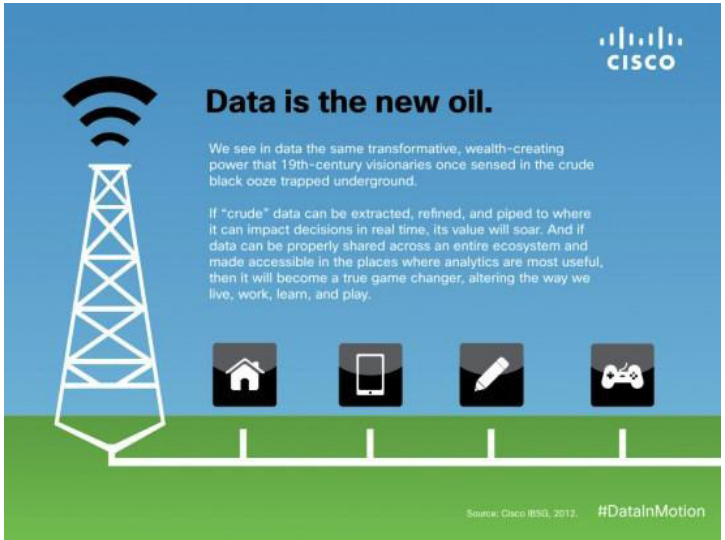


PART 3: THE ROLE OF DIGITAL TECHNOLOGIES IN A COMPETITIVE KNOWLEDGE ECONOMY

ICTs as ‘market enablers’ (in the New Institutional Economic) frame…

But also data gatherers.

And platforms for research and development.



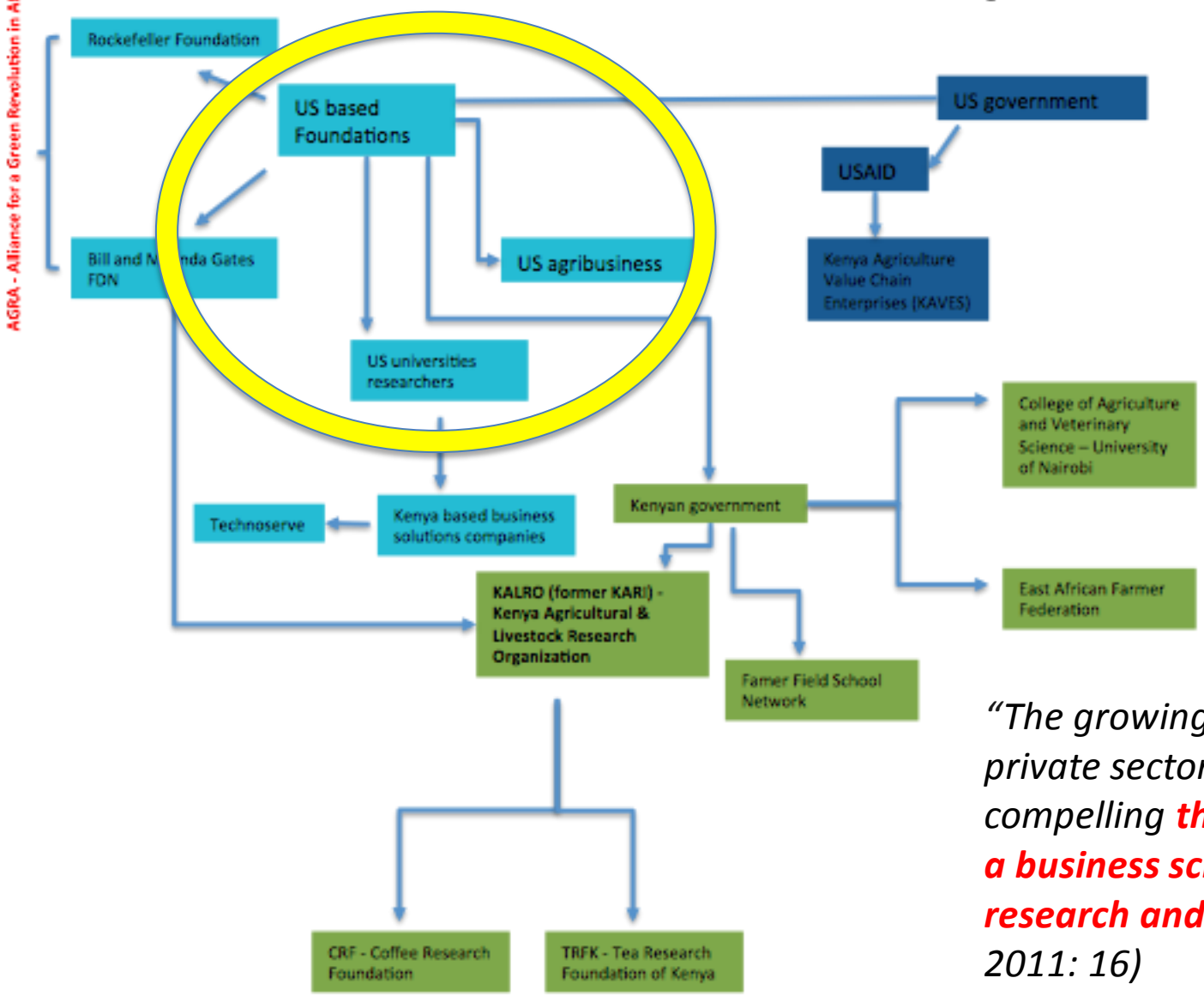
Important Notes on African R&D

1. **Adjustment era has had a profound impact on African institutions of higher education and research**: massive brain drain, switch of curriculum away from research towards professional courses, dependence on foreign funding, a context in which African researchers are often forced into the role of data gatherers for foreign research projects (Mamdani, 2007).

1. Due to the dependence on foreign sources of finance, **research in African countries is heavily dominated by donor paradigms.**

1. Particularly, as research becomes increasingly commoditized and audited within advanced economies, there is a strong emphasis on commercial applications of publicly funded research and humanitarian aid. Thus in both the private and public sector, we see **an increasing overlap between the developmental paradigms of donor countries, their research agendas and the commercial interests of their firms and scientists** (McGoey, 2014).

Research 'Partnerships'



"The growing importance of the private sector and value chains compelling ***the incorporation of a business school optique into research and training****" (Moock, 2011: 16)*

ICTS IN RESEARCH ACTION

Platform

Digital Disintermediation
or Re-intermediation?

User

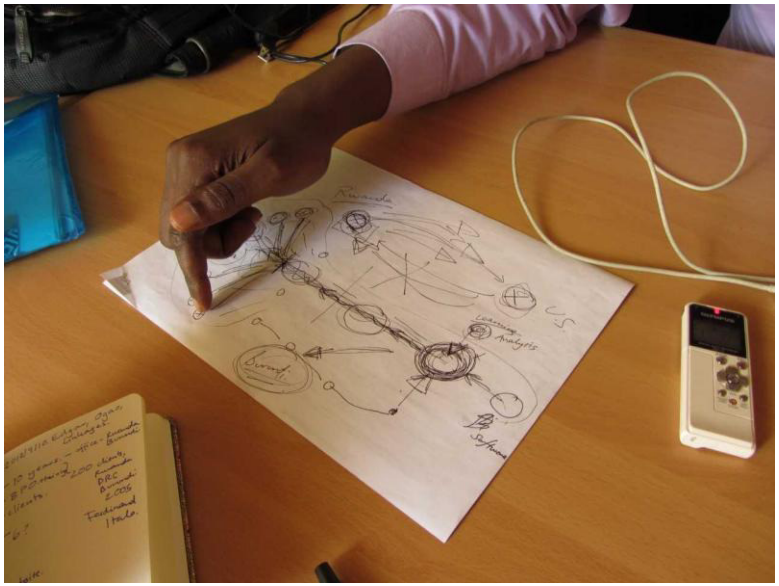


Photo from interview with m-health firm in Rwanda, 2013

If we think back to the idea of development as being about generating a sustainable technological surplus, **we see how ICTs can become platforms for extracting technological surplus from existing value chains. Therefore while ICTs increase efficiency for their users (through the NIE paradigm), they also generate a new kind of value from the data itself.**

A TALE OF TWO GREEN VALLEYS

Struggles over

Data-Driven Agro-Innovation in

California's Central Valley and

Kenya's Rift Valley

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http://www.lse.ac.uk/africa/research/two
ys

- Farmers in both regions are deploying **digital technology to increase productivity and reduce transaction costs. Some are also using tech to move into new areas with technological premiums** (single origin, fairtrade, organic, etc.)

- As compliance hardens or as farmers integrate within larger input and supply chains, **these digital systems may become requirements.**

- Informational chains have value beyond farmer and compliance agency, **providing the platform operator with valuable market intelligence and framework for R&D.**

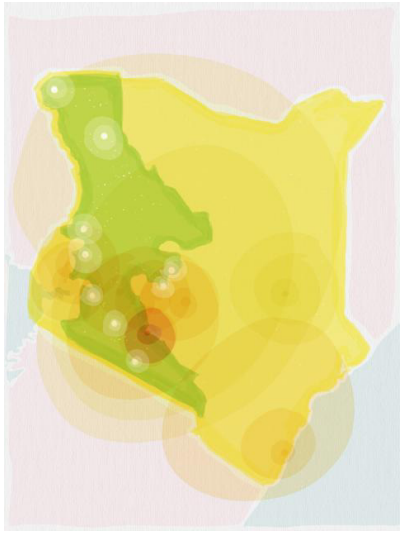
- Thus while digital platforms promise to increase production, reduce waste and ensure compliance, **they also generate a new economic value (or technological premium) for the controllers of the platform….**

Research Question:

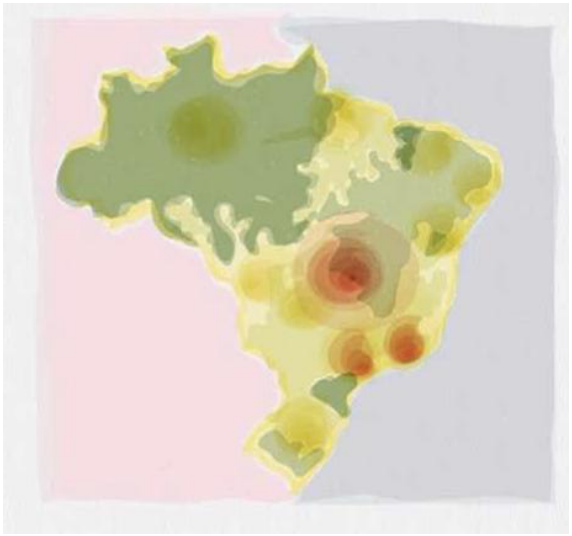
Will this ‘datafication’ of the agricultural value chain **boost the competitiveness of agriclusters in emerging countries** like Kenya? Or will it instead **widen the knowledge gap, with actors from more advanced economies monopolising control over the technological surplus** generated by digital data on farms in both North and South?

California's Central Valley

Kenya's Rift Valley



Potentially Brazil



EMBRAPA (Empresa Brasiliera de Pesquisa Agropecuaria)

Conclusions

1. To encourage African tech developers to **look beyond the NIE frame and see both the limits of NIE, and the potential opportunities of a wider paradigmatic horizon**.
2. To draw **attention to the research context,** both in terms of the funding of ICT related research within African countries, but also the ways in which ICTs are being embedded within research 'partnerships' in other areas such as agriculture and social policy.
3. To see these research partnerships as being marked by **commercial imperatives, and thus to a certain degree, competitiveness over the knowledge or technological surplus** generated through digital intermediation and data.
4. To **push back against a technologically deterministic account of digital economic change** by demonstrating how the economic impacts of digital technologies critically depend on the nature of the dominant developmental paradigm or ideas being pursued by its firms, policy-makers and funding agencies.

Questions?

Some relevant publications (happy to share any of them):

Kleibert, J. and L. Mann (Unpublished but Draft Available) "Capturing Value Amidst Global Restructuring? Economic Development and Information and Technology-Enabled Services in India, the Philippines and Kenya"

Mann, L. (2018) "Left to Other Peoples' Devices: A Political Economy Perspective on the Big Data Revolution in Development" *Development and Change* 49(1): 3-36.

Foster, Christopher, Graham, Mark, Mann, Laura, Waema, Timothy and Nicholas Friederici (2018) "Digital Control in Value Chains: Challenges of Connectivity for East African Firms" *Economic Geography* 94(1)

Connectivity at the OP Forum (2017) "Connectivity at the Bottom of the Pyramid: ICT4D and Informal Economic Inclusion in Africa" Bellagio Centre White Paper, December 2017.

Mann, L. and M. Graham (2016) "The Domestic Turn: Business Processing Outsourcing and the Growing Automation of Kenyan Organisations" *Journal of Development Studies* 52(4): 530-548.

Mann, L. and E. Nzayisenga (2015) "Sellers on the Street: the Human Infrastructure of the Mobile Phone Network in Kigali, Rwanda" *Critical African Studies* 7(1): 26-46

My email: l.e.mann@lse.ac.uk

My twitter: @balootiful (personal) and @TwoGreenValleys (new project- content coming very soon!)