THE ECONOMICS & POLICY IMPLICATIONS OF INFRASTRUCTURE SHARING AND ITS ROLE FOR THE DEVELOPMENT OF ICT NETWORKS IN AFRICA

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INTERNET SUPPLY CHAIN

Internet Networks

- International Connectivity
- National Backbone
- Backhaul Network
- Access Network

Services

- Connectivity
- Management & Intelligence
- Value Added

Assets

- Passive Infrastructure
- Active Infrastructure
- Intangible

INTERNET ECOSYSTEM

Devices

R&D

Patents

Device Manufacturing

HW components

Content

Generation

Aggregation

Itunes Store, Spotify, Netflix

Network

Equipment

Backbone

Access

Related Networks

Voice

Television

Retailers

Consumers

Applications

Operative system

Android, Windows,Linux, OSX, IOS

App

App. Aggregation

Google Play, Windows Store, Apple Store

DEMAND TRENDS

TECHNICAL PROGRESS

NEW DEVICES

MULTIMEDIA DEMAND

NEW TYPES OF TRAFFIC

INNOVATIVE ACCESS

MULTICASTING NGN
Shift interconnection point

SPECTRUM SHARING
Light Licensing

CONGESTION CONTROL
TECHNOLOGIES

STRATEGIC BEHAVIOR OF AGENTS TOWARDS SHARING

MARKET AGENTS

COMPETITIVE ADVANTAGE

BUSINESS MODEL

ENVIRONMENT

MARKET & REGULATORY FAILURES

COMPETITIVE STRUCTURE

MARKET CONDITIONS

TECHNOLOGY

REGULATORS

REDUCE MARKET FAILURES

REDISTRIBUTION POLICIES

REGULATION

INFRASTRUCTURE SHARING

MODELS

- ASSET SHARING
- MUTUALIZATION
- COLLABORATION

DIMENSIONS

- COMMERCIAL
- REGULATORY
- TECHNOLOGICAL

INFRASTRUCTURE MUTUALIZATION WAVES IN AFRICA

FIRST WAVE
Undersea cables

→ Market Agreement

SECOND WAVE
National backbone

→ New Backbone:
SOE (Rwanda)
Consortium (Burundi)

→ Existing Backbone:
SBC (Botswana)
IBC (South Africa)

THIRD WAVE
Mobile Access + Spectrum

→ Kenya, Rwanda
Competition, innovation,
investment concerns

BACKBONE INFRASTRUCTURE SHARING

ASSET SHARING

ACCESS/ INTERCONNECTION

TRANSIT PAYMENTS
Tier 3 - ISP

PEERING
Tier 1, 2 - IBP

Bargaining power

Type of traffic
Geography

Competition if Multi-homing

MUTUALIZATION

PUBLIC PRIVATE PARTNERSHIP
Ownership structure
Risk Sharing

MULTIHOMING
International +
National Backbone

Mutualization VS Network Duplication

FIXED ACCESS INFRASTRUCTURE SHARING

ASSET SHARING

Full unbundling (Technology Neutral)
Line sharing (Not neutral)
Virtual unbundling (Control of access)

Point of Interconnection choice / Multicast

Competition VS Coordination complexity

MUTUALIZATION

Bitstream access (Bandwidth for entrants)
Next generation bitstream (Flexibility)

Service Based Competition

Entry vs innovation

High Sunk Costs-Entry barriers
Network: Asymmetry (xDSL) Mandated Sharing / Symmetry (NGN)

MOBILE ACCESS INFRASTRUCTURE SHARING

ASSET SHARING

PASSIVE

Uncoordinated (Technology neutral)

ACTIVE

Coordination (Standards & Technologies)

Site sharing (30% savings)
Tower sharing (30% savings)
RAN sharing (Rural Areas)

Network Symmetry
Service Based or Facility Based competition

MUTUALIZATION

MARKET AGREEMENT

National Roaming (Early rollout stages)
Core Network Sharing (Uncertain)
MNVO (Only retail)
Outsourcing (TowerCo & Tenancy ratio)

MANDATED MUTUALIZATION

Participation of operators is KEY
RISK of reduced investment & innovation
Share of existing sites
Other option: Refarming of existing bands

REDUCTION OF MARKET AND REGULATORY FAILURES

- Externalities: Positive & Negative
- Reduce entry barriers- Increased competition - access network-
- Synergies in construction, operation and maintenance of linear infrastructures. Coordination failure
- Remove regulatory failures/ Spectrum allocations (Shared use, Light licenses, refarming)
- Reduce interferences, easing Technology and service neutrality

MARKET DISTORTIONS

CHALLENGES

SBC - Short Run competition
FBC - Long Run competition- Real competition

Disincentives to investment & innovation

Disincentives to network quality but incentives cost reduction

SOLUTIONS

Ladder of investment:
Increase price over time
Cave (2006)

Asymmetric allocation of risk
Incorporate risk in access price from beginning- Pindyck (2007)

Ecosystem:
Economies of scope/ bundling
Economies scale/ Towerco

Efficiency: Allocative/Productive/Dynamic

POLICY RECOMMENDATIONS

- Enable commercially driven sharing when doesn't distort competition.
- Enable the environment to leverage the opportunities of the collaboration among linear infrastructures providers.
- Subsidies and State Aid to support mutualized network infrastructures should only be granted in cases where the private sector is not able to operate correctly.
- Mandated sharing is the last resource to reduce infrastructure bottlenecks when infrastructure competition is not possible.
- Political economy matters. Simple solutions, without complex regulatory changes are effective.

POLICY RECOMMENDATIONS

- Demand side policies help. The aggregation of demand is a good measure to reduce prices of connectivity.
- The Government might better promote investments in the ICT sector acting as a demand anchor client rather than creating SOEs
- Remind the importance of the interactions of the Internet supply chain with the markets of the Internet ecosystem.
- Tackle spectrum allocation bottlenecks, with additional allocations to mobile and innovative authorization regimes allowing the shared use of spectrum.