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

José Marino García
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
- Device Manufacturing
  - HW components
- Patents

Content
- Generation
- Aggregation
  - Itunes Store, Spotify, Netflix

Network
- Equipment
- Backbone
- Access
- Retailers
- Consumers

Related Networks
- Voice
- Television

Applications
- Operative system
  - Android, Windows, Linux, OSX, IOS
- App
  - App. Aggregation
    - Google Play, Windows Store, Apple Store
DEMAND TRENDS

NEW DEVICES
MULTIMEDIA DEMAND
NEW TYPES OF TRAFFIC

TECHNICAL PROGRESS

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

SECOND WAVE
National backbone

THIRD WAVE
Mobile Access + Spectrum

Market Agreement

New Backbone: SOE (Rwanda) Consortium (Burundi)

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

Kenya, Rwanda Competition, innovation, investment concerns
BACKBONE INFRASTRUCTURE SHARING

ASSET SHARING

ACCESS/ INTERCONNECTION

TRANSPORT 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)
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
• 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.
• 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.