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

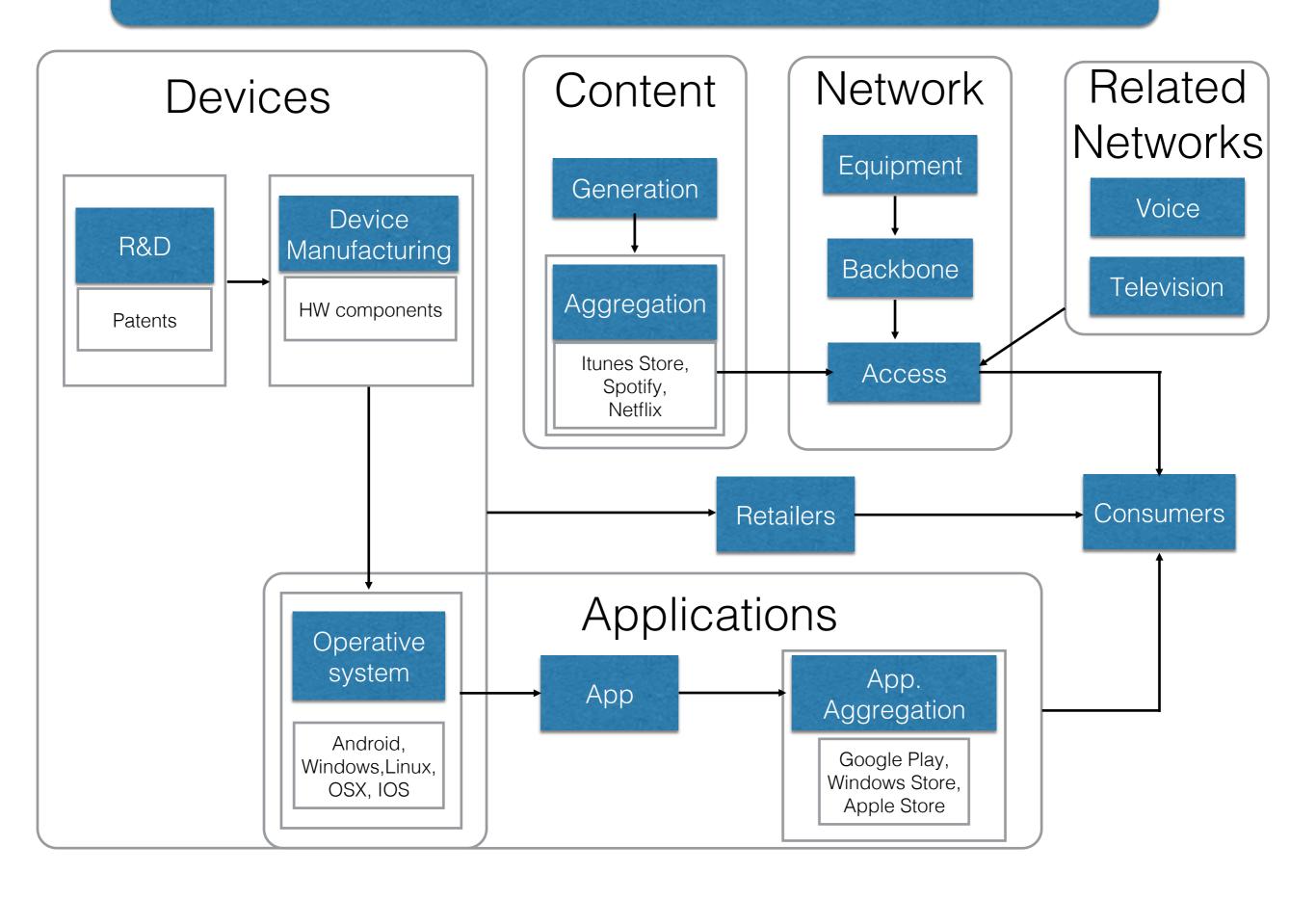
Assets

Passive Infrastructure

Active Infrastructure

Intangible

INTERNET ECOSYSTEM



DEMAND TRENDS

TECHNICAL PROGRESS

NEW DEVICES

MULTIMEDIA DEMAND

NEW TYPES OF TRAFFIC

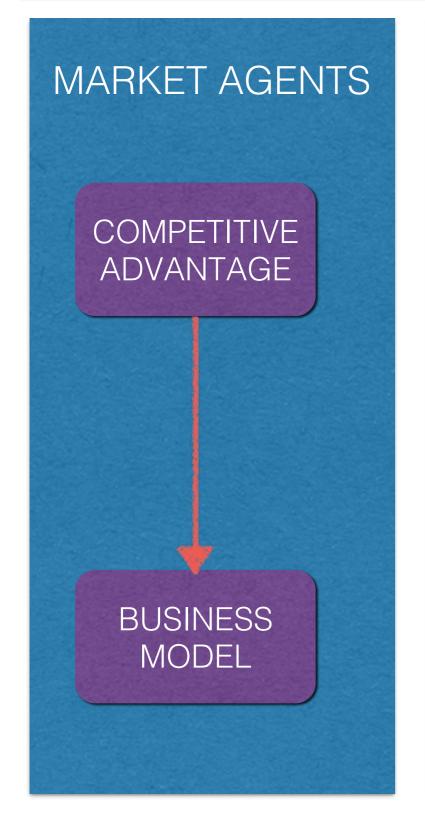
INNOVATIVE ACCESS

MULTICASTING NGN
Shift interconnection point

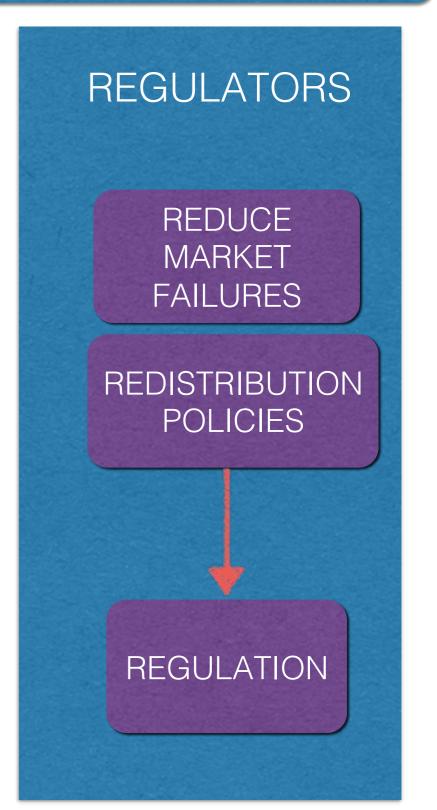
SPECTRUM SHARING Light Licensing

CONGESTION CONTROL TECHNOLOGIES

STRATEGIC BEHAVIOR OF AGENTS TOWARDS SHARING







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)

Kenya, Rwanda
Competition, innovation,
investment concerns

THIRD WAVE
Mobile Access + Spectrum

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.