From POTS to PANS...

End of industrial-age silos...

Convergence
Offering of services across traditionally distinct broadcasting and telecommunications platforms as a result of digitization and liberalization of markets

Economic infrastructure
- Investment in
- Capital in

End of industrial-age silos...

Information Technology

Broadcasting  Telecom  Postal
Economics of infrastructures

- Investment in infrastructure
- Capital intensive
- Sunk
- Lumpy
- Economies of scale/scope...

Natural monopolies

- Least cost of production of the total market demand is achieved by the existence of single firm
- High fixed cost, low marginal cost
- Uneconomic duplicate = public utilities
Drivers of 20th

- Globalisation of economies/markets
- Democratisation (state)
- Digitisation (technology)
- Liberalisation (markets)
Convergence
Offering of services across traditionally distinct broadcasting and telecommunications platforms as a result of digitalisation and liberalisation of markets.
INFORMATION INFRASTRUCTURE

Source: Centre for Tele-information, Danish Technical University
Changing nature of the state

- Multiple loci - global economic governance; regional integration; national admin justice processes, local delivery
- Sectoral characteristics - state role different in relation to the means of production/delivery in each sector
- Various modes of regulation (WTO, NRAs, Competition Commissions)
- Embedded in older layers of governance (ITU, PTOs)
- Dependent on national institutions and practices (institutional endowments)
- Alignment with ‘global trends’ dependent on national political economy.
From monopoly to competition

- Monopoly/public utility model - natural monopoly
- Best consumer welfare outcomes through competition - widest range of choice and lowest prices
- Historically state (other than US) owned monopoly transfer to private ownership and risk unlike new models of public-private interplay where the relative powers and resources of both sectors are leveraged to achieve wide-based national benefit
- Success dependent on appropriate market structure, clear institutional arrangements, high levels of state co-ordination across sector, and tiers of government (many developing states lack capacity to implement)
- Sequencing (Scott Wallsten 2004)
Paradox of deregulation

Market failure

- Natural monopolies
- Externalities: actions of one user affect other network users
  - Positive: more users on a network provides each user with more utility
  - Negative: more users on a network can lead to congestion
- Barriers to entry
  - Economies of scale
  - High fixed/capital costs
  - Intellectual property rights such as copyright and patent protection
Regulatory reform

- Government - policy makers
- Regulation - independent
- Operations - competitive
- Independent of operators
- Independent of government / industry
- Allocative efficiencies
- Based on procedural legitimacy
- Expertise/capacity
- Effectiveness

Assumes: democracy, mature markets, basic access, institutional capacity.
Sector performance as policy outcomes...

- Policy
- Regulation
- Policy outcome

- Market structure
- Conduct
- Market performance

- Sector Performance
Telecommunications Regulatory Environment

Overall Comparative TRE 2011


Market Entry

Quality of service

Access to scarce resources

Universal service obligations

(1 costs, public good) undercut facility of ordinary market mechanism deliver on contracting problems.
Institutional challenges of regulation

Complementary mechanisms required to restrain administrative action:
- Substantive restraint on discretionary actions
- Formal/informal restraints on changing regulatory system
- Institutions to enforce the restraints

Credible Commitments
- Balance between certain regulatory systems and flexibility to accommodate change
- Nature of utilities (scale and scope, sunk costs, public good) undercut ability of ordinary market mechanism to deliver on contracting problems
Why might anticipated outcomes not be reached even with evidence?

State structures, political and legal institutions all shape public policies. "...political economies - like political systems - are structured by dense interactions among economic, social and political actors that work according to different logics in different contexts."

Institutional arrangements - autonomy of political economy, power, interests, patronage, regulatory states vs developmental states

Regulatory states

Why might anticipated outcomes not be reached even with evidence?

- State structures, political and legal institutions all shape public policies. “...political economies - like political systems - are structured by dense interactions among economic, social and political actors that work according to different logics in different contexts.”
- Institutional arrangements - autonomy of regulate to implement policy independently of state or industry capture
- Institutional endowments of country
- Political economy, power, interests, patronage
- Regulatory states vs developmental states

Levy and Spiller (1994) Institutional Foundations of Regulatory Commitments
Evans, P (2005) Embedded Autonomy: States and Industrial Transformation
Levy and Spiller (1994) Institutional Foundations of Regulatory Commitments
Evans, P (2005) Embedded Autonomy: States and Industrial Transformation
Increase growth, reduce inequality?

Major barriers to sector growth:
- Lack of investment/competitive or affordable backbone
- Size/quality of infrastructure/ bandwidth
- High costs/price of access to communications
- Effective regulation/weak institutional arrangements
- Beyond access: Human development
  - Income
  - Education
  - Skills

- Political economy, patronage
- Regulatory states vs. non states
ICT economic growth & job creation

- Waverman and Roller: GDP and fixed, mobile, broadband penetration issues of causality
- Christine Zhen-Wei Qiang 2009 (World Bank) 10% broadband penetration growth increased GDP growth by 1.4%.
- Pantelis Koutroumpis The Economic Impact of Broadband on Growth: A simultaneous approach.

- Uneven, inequality, freedom?
Broadband issues

Broadband introduces levels of complexity in policy, regulation, business models and consumer choice.

<table>
<thead>
<tr>
<th>Supply side policies</th>
<th>Demand side policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment/competition</td>
<td>Affordability of services/ devices</td>
</tr>
<tr>
<td>Core/access network expansion – public/private</td>
<td>Government leadership/role model - demand stimulation</td>
</tr>
<tr>
<td>Reduction of infrastructure costs</td>
<td>Regulation/ ICT skills development/</td>
</tr>
<tr>
<td>Spectrum allocation and assignment</td>
<td>Online local content, applications, e-gov services</td>
</tr>
<tr>
<td>Universal access/service</td>
<td>Consumer welfare/ user empowerment</td>
</tr>
</tbody>
</table>
Cost of not enabling broadband high

Based on the spill-over impact of digitization, the incremental GDP of this scenario is R 111,000 million

**SOUTH AFRICA: DIGITIZATION CUMULATIVE ECONOMIC IMPACT (2013-2020)**

<table>
<thead>
<tr>
<th>Impact</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitization GDP (R M)</td>
<td>69,055</td>
<td>90,397</td>
</tr>
<tr>
<td>Employment</td>
<td>306,000</td>
<td>400,000</td>
</tr>
<tr>
<td>Speed GDP (R M)</td>
<td>2,163</td>
<td>20,907</td>
</tr>
<tr>
<td>Employment</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total GDP (R M)</td>
<td>71,218</td>
<td>111,304</td>
</tr>
<tr>
<td>Employment</td>
<td>306,000</td>
<td>400,000</td>
</tr>
</tbody>
</table>

R38,500 million in GDP and 204,000 jobs/year

**SOUTH AFRICA: DIGITIZATION ECONOMIC IMPACT (2004-2012)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitization Index</td>
<td>20.15</td>
<td>21.89</td>
<td>23.58</td>
<td>24.18</td>
<td>24.55</td>
<td>25.61</td>
<td>26.75</td>
<td>30.61</td>
<td>33.40</td>
<td>-</td>
</tr>
<tr>
<td>GDP created (in Million Rands)</td>
<td>-</td>
<td>3,478</td>
<td>3,602</td>
<td>1,397</td>
<td>828</td>
<td>2,484</td>
<td>3,509</td>
<td>13,352</td>
<td>9,853</td>
<td>38,502</td>
</tr>
<tr>
<td>Jobs created (000)</td>
<td>-</td>
<td>25</td>
<td>26</td>
<td>9</td>
<td>6</td>
<td>16</td>
<td>18</td>
<td>60</td>
<td>44</td>
<td>204</td>
</tr>
</tbody>
</table>

Source: Own calculations using Katz, and Koutroumpa(2013b)
ICT ecosystem

20th Century economies

Paradigm of competition (state) and technology

Economic transformation

From monopoly to competition
From simple value chains ...

Example 2G Value Chain

- Equipment & handset vendors
- Network operation
- Network access provision
- Retail handset and service sales

Enablers:
- Manufacturers
- Middleware
- Content
- Applications
- Internet access
- Portals
- Network operation
- Network access
- Handsets, terminals

- Bauer, J (2015) RIA Research Workshop
Disruptive competition

Theory of disruptive competition and innovation pioneered by Clayton Christensen explains how and when a business model is likely to succeed through innovation and disruption of the market.

http://www.claytonchristensen.com/key-concepts/
Changing sector conditions

- continued rapid technological and economic change (Moore’s, Cooper, Metcalfe Laws)
- growing interdependence among players in proliferating two- and multi-sided markets
- digital technology accelerates innovation and intensifies competition
- high fixed/near zero incremental cost technology necessitates pervasive price discrimination resulting in market concentration
- recognition of the importance of investment and innovation in capacity development
- realistic view about the prospect and limits of unregulated markets realising the benefits of ICT

See Bauer
From static to dynamic regulation

- Creating conditions that facilitate high capital investment required for deployment of next generation networks to support innovation
- Static regulation transition from monopoly to open market (assumes core network infrastructure in place)
- Structural and conduct regulation at wholesale level (interconnection, unbundling, price regulation).
- Digitisation and convergence allows for multiple entrants, migration of services and content across platforms
- High levels of substitution - fixed, wireless, instant messaging, social networking
- New complementarities - content & apps drive data
References


Net neutrality

- Policy measures aimed at the public internet lane transfer issues to other parts of the value chain where struggle by players in video distribution value chain are trying to influence and control access that consumers have to content and applications.
- Transparency as first, non-intrusive measure
- Focus at the public internet lane in the distribution
- Part of response constrained by bundled (triple play) strategies
- No blocking/throttling as next step
- Reasonable network management
- No retail tariffing by ISPs of OTT as business

Peering Conflict driven through asymmetric traffic profiles
Steering eyeballs Search & navigation

Changing

- continued rapid change (Mobile)
- growing internet proliferating