



Universität St.Gallen

# Telecommunications Ownership and Control (TOSCO)

A new dataset on ownership of internet infrastructure in Africa, 2000-2016

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# Motivation

The digital space is built on infrastructure owned by actors ...

- private and public
- domestic and foreign

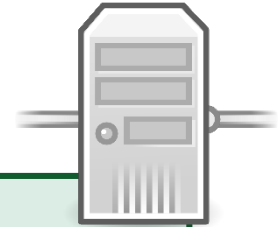
... with specific economic and political interests

- Access to internet (services) is no resource any actor has necessarily and automatically at free disposal
- ISPs as centralized points of control (DeNardis 2014; Goldsmiths & Wu 2006)
- We argue that who owns ISP companies plays a crucial role in terms of the spread and effects of the internet

# Architecture of the internet

## Infrastructure

hardware (router, server, fibre-optic cables, ...)



## Logic

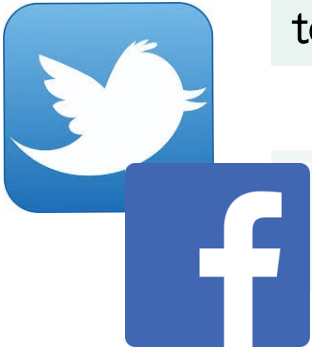
techn. norms + standards (internet protocol, domain-name-systems...)



ICANN

## Application

software (www with browser, social media, search engines...)

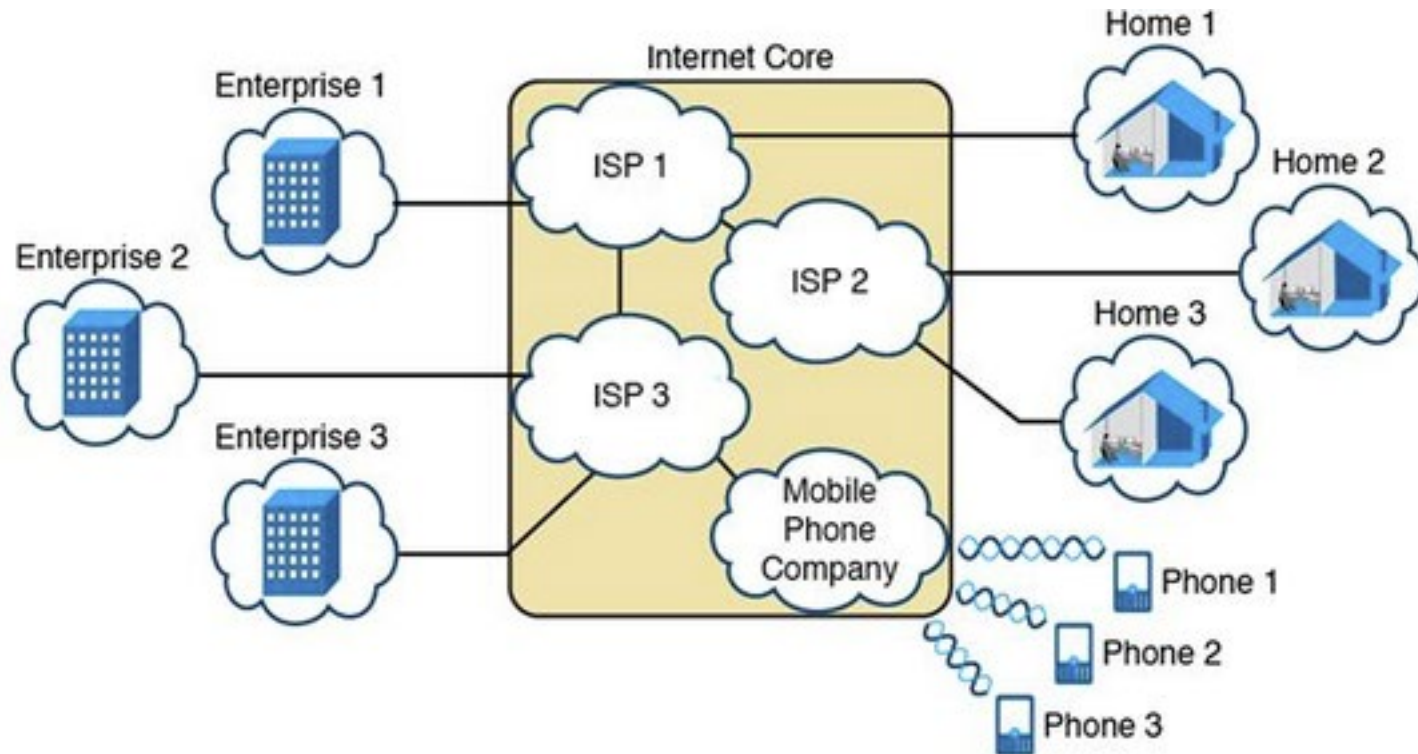


## Content

user generated data (texts, images, videos...)



# Physical and technological infrastructure



→ ISPs provide the so-called last mile connection

# Ownership as a variable in political science research

systematic literature review of top political science journals, 1945 -2019  
⇒ ownership as a variable is gaining prominence

## *Key findings*

ownership type reflects specific form of business-state relations, which influences outcomes

- media reporting (Markus & Charnysh 2017; Bailard 2016; Dunaway & Lawrence 2015; Hughes & Lawson 2005; Gilens & Hertzman 2000)
- negative political and economic outcomes attributed to mineral wealth (Wegenast & Schneider 2017; Austvik 2012; Emel, Huber & Makene 2011; Luong & Weinthal 2006; Abel 1957)

## **Distinction between three types of ownership**

state-majority | private-foreign | private-domestic

# Conceptualization of owner identities

## Owner

= any decisive actor that controls considerable shareholdings in a company

= shapes corporate strategy, incl. corporate social responsibility (e.g. right to elect board of directors; appoint management team; approve mergers)

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	<b>State</b>	<b>Individual/ Family</b>	<b>Corporation</b>	<b>Financial Institution</b>
<i>Goals</i>	political objectives	wealth maximation	profit maximation	asset maximation
<i>Attitudes toward risk</i>	willing	averse	neutral	willing
<i>Control over the management</i>	high	high	medium	low

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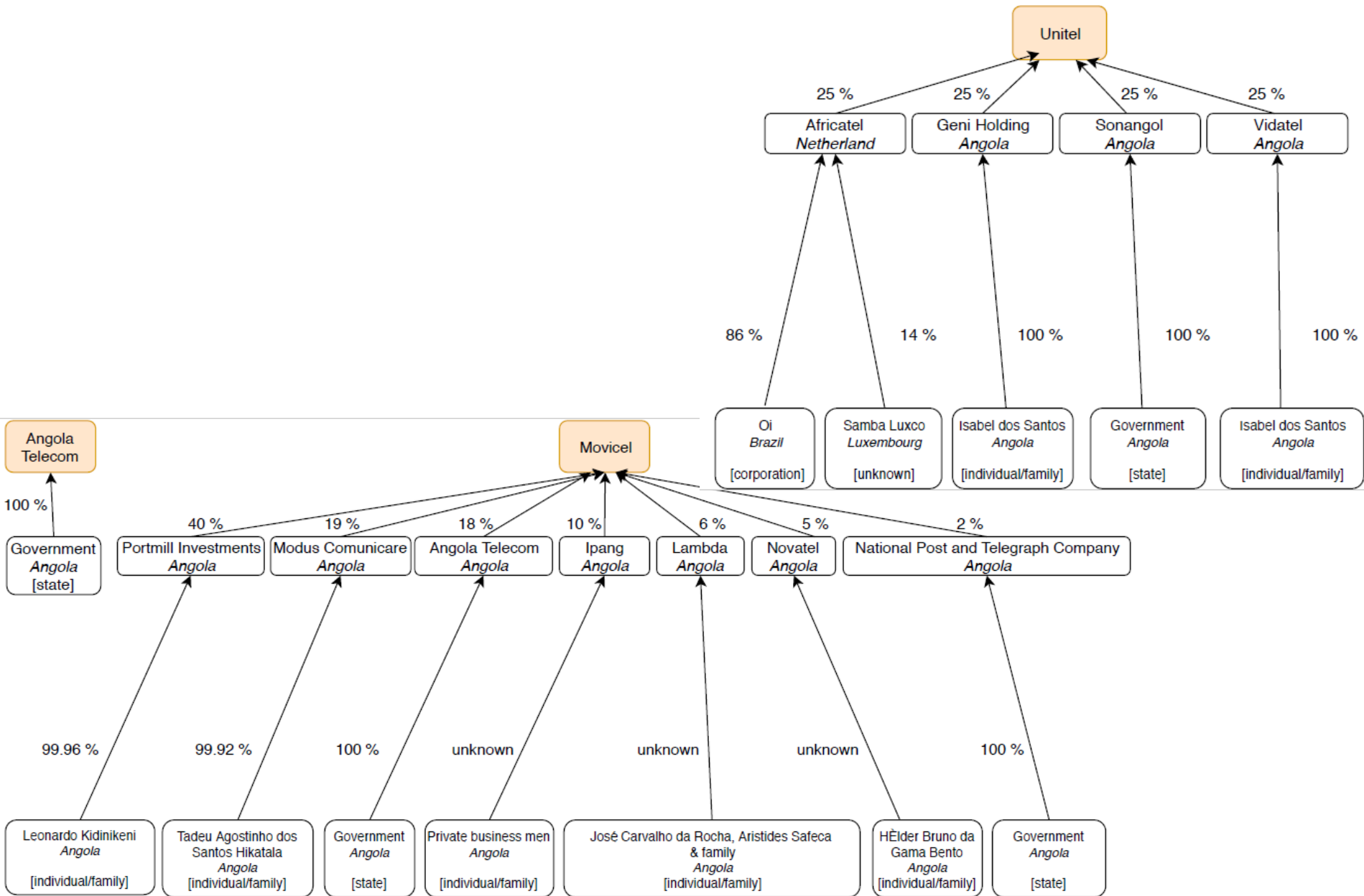
(La Porta et al. 1999; Thomsen and Pedersen 2000; Strange 2018:1235; Sur et al. 2019)

+ location of headquarter and/or stock exchange

# Telecommunications Ownership and Control (TOSCO)

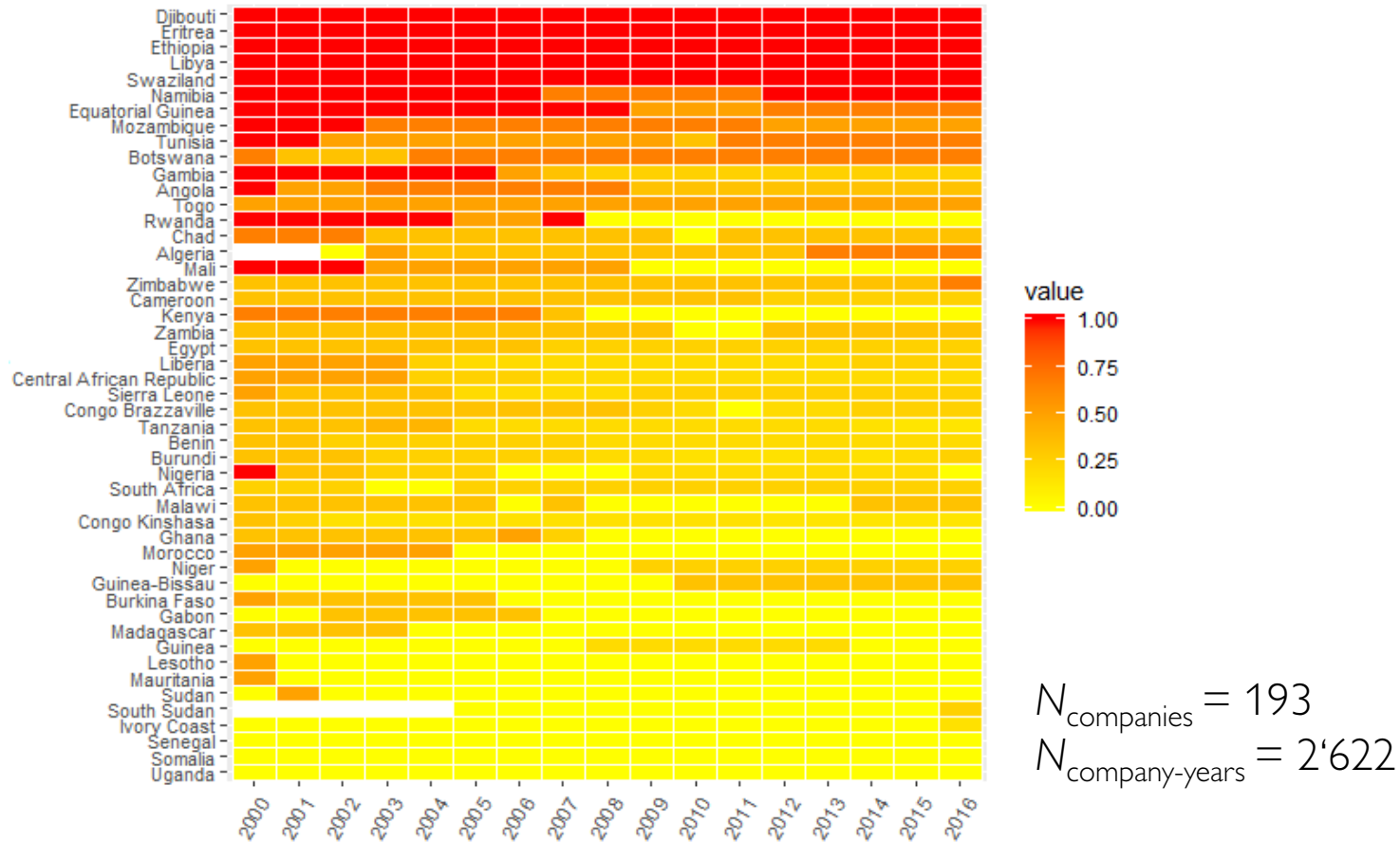
Objective	Mapping the ownership structure of ISPs in Africa
Focus	Companies with official state licenses to operate cables GSM (and later generations) services (→ no MVNO)
Time period	2000-2016 (→ start/end date differs for each company)
Countries	50 independent mainland countries in Africa, incl. Madagascar
Sources	<ul style="list-style-type: none"><li>• Financial-analysis tools (e.g., Eikon and Orbis)</li><li>• Specialized blogs (e.g., Research ICT Africa)</li><li>• News websites such as All Africa and Quartz Africa</li><li>• Bloomberg Snapshot repositories</li><li>• Academic/research reports</li></ul> → Triangulation with ISPs' annual reports + Data from market research and analysis companies (e.g., GSMA, TeleGeography)

# Structure of internet ownership in Angola, 2016





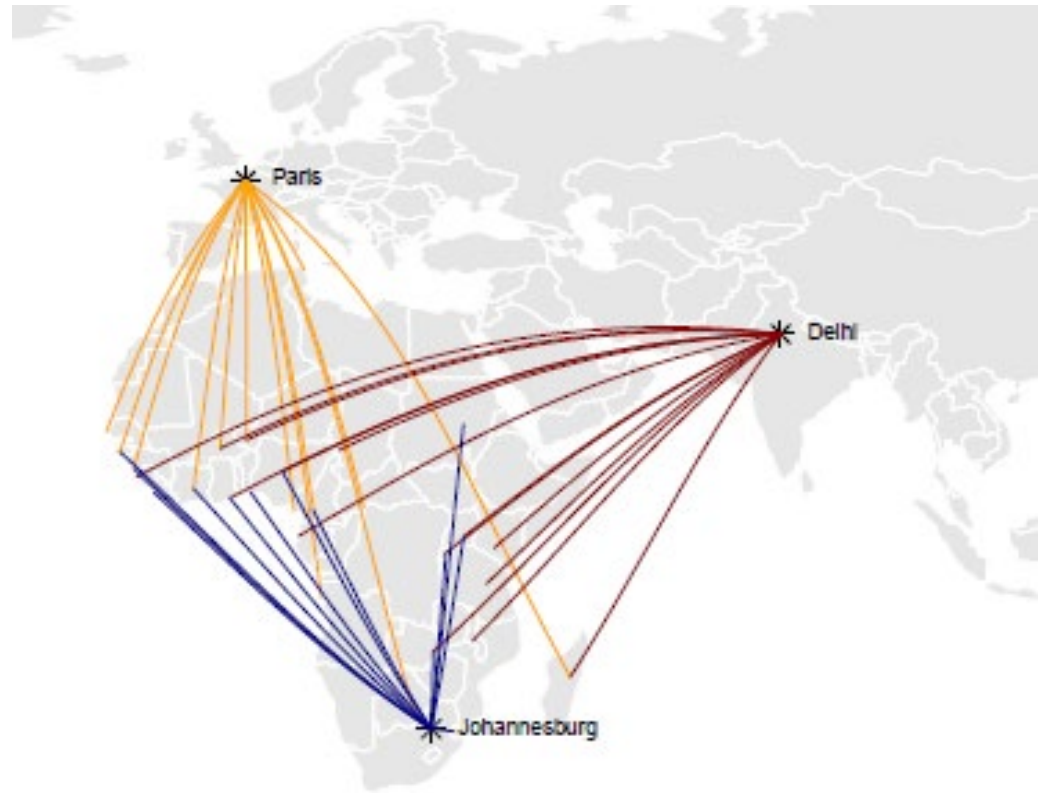
# Patterns of (majority) state involvement in ISPs



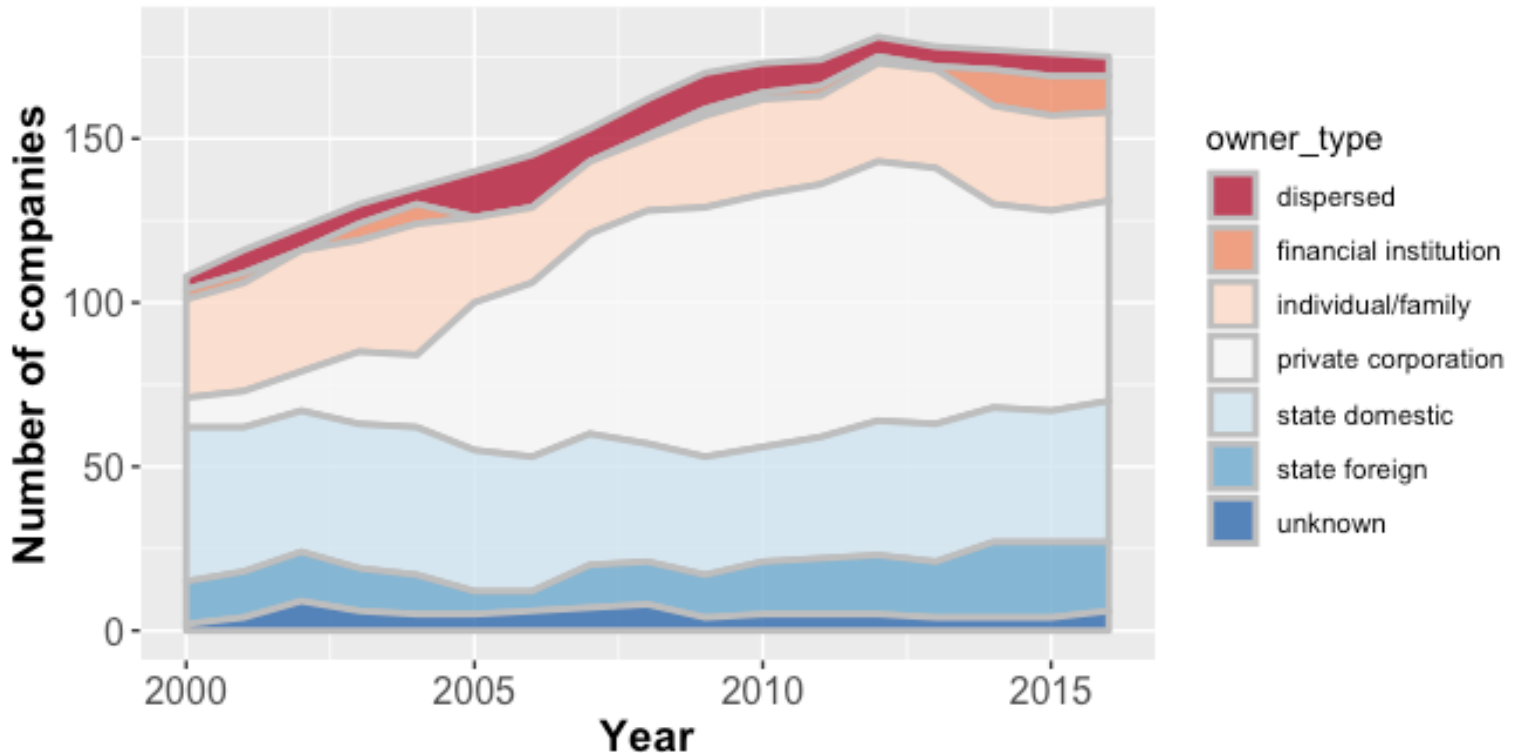
The darker the squares are shaded, the higher the degree of domestic state involvement among all ISPs in a country in a given year, e.g. red squares mark 100 percent state-owned telecom sector; empty squares for years with no ISPs.

# Headquarters of the three biggest shareholders (2016)

- ❖ Orange (France)
- ❖ Bharti Airtel (India)
- ❖ MTN (South Africa)



# Distribution of majority owner type, 2000-2016



If no single majority owner exists, we determine majority owner type based on totaled shares of the dominant shareholder group; companies with no single or collective majority owner type have dispersed ownership.

# Potential applications of TOSCO

*exploratory exercise*

## ownership as dependent variable

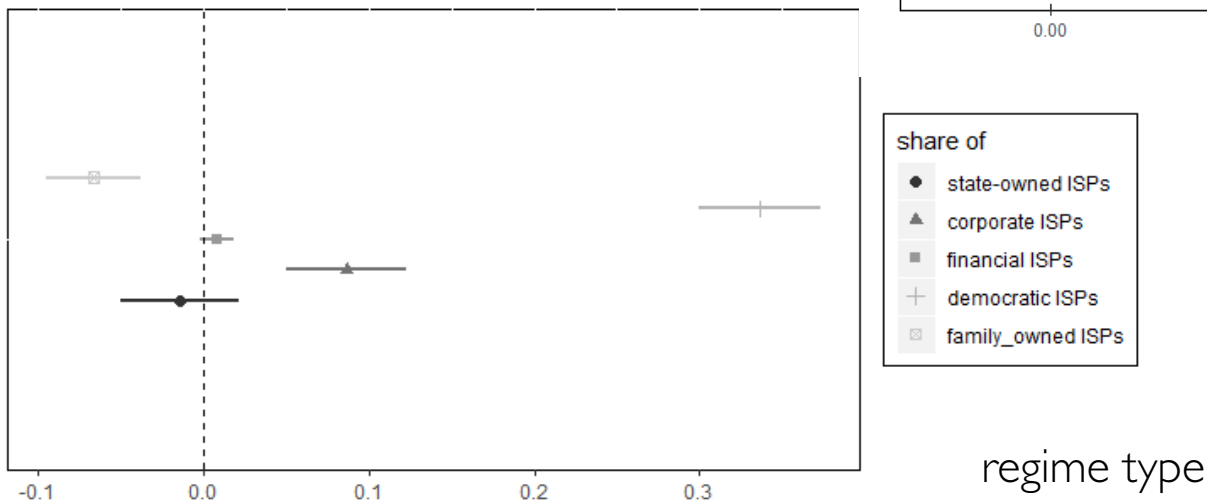
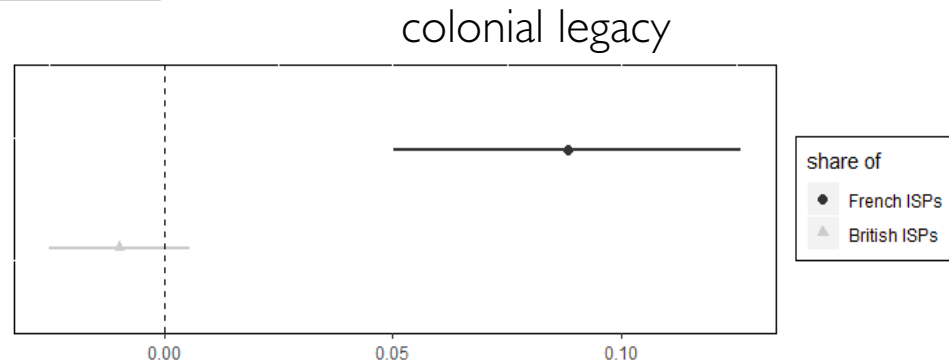
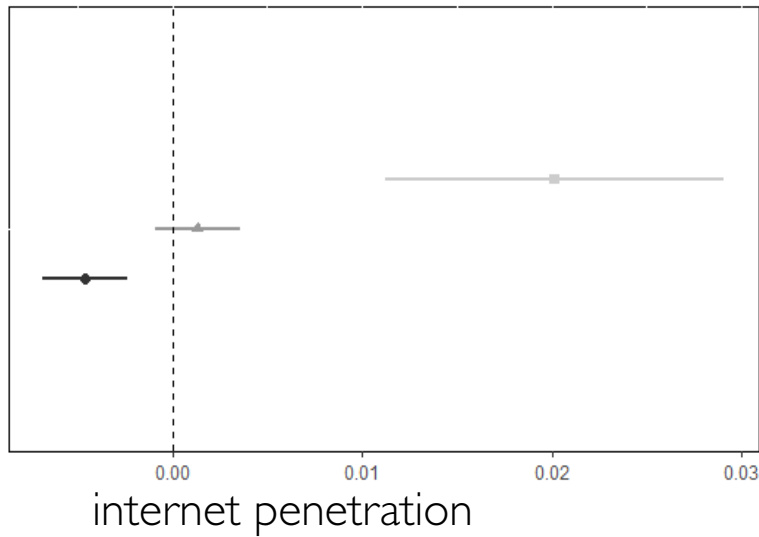
- changes in the ownership structure of the telecommunications sector (regime type; colonial legacy; internet penetration)

## ownership as independent variable

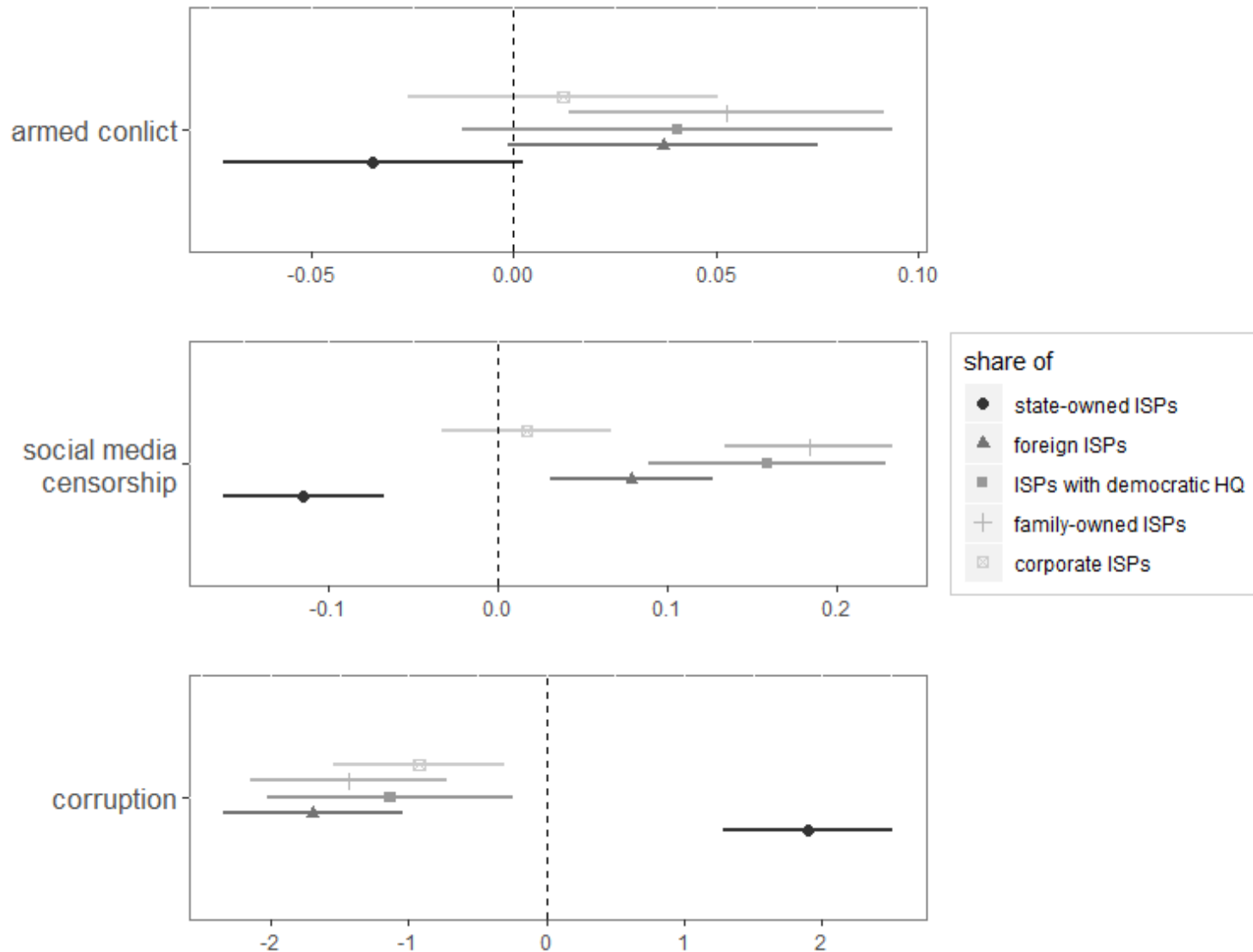
- effects of ownership on violence, corruption, and censorship

controls: GDP per capita, colonial ties, internet penetration, region and regime type (unless any of these factors became the key independent or dependent variable)

# Ownership as dependent variable



# Ownership as independent variable



# Contribution

TOSCO allows for cross-sectional, time-series large- $N$  analysis of the determinants and effects of ISP ownership in the African developing context.

- **detailed disaggregated information** about ISP ownership at three levels (countries, companies/autonomous systems, shareholders)  
=> allows tailoring measurement to needs of researcher/ practitioner
- **detailed coding documentation** of sources and coding choices  
=> allows tracking individual coding decisions and context
- **provision of autonomous system number** for market-active companies  
=> allows exploring topical relationships, e.g. ISP ownership and the diffusion or the disruption of access to the internet (services)



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Thank you

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