

# Spectrum policy for competition and development: a comparative study of approaches and outcomes in Africa

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\* Disclaimer: Please note that the views represented here are the author's and do not necessarily represent those of Acacia Economics

# Mechanisms for spectrum assignment

## Beauty contests vs. auctions

### Beauty contests:

- Slow, wasteful and vulnerable to lobbying
- Not transparent
- Regulators have less information than operators on what the best use of spectrum is and how valuable it is

### Auctions:

- Facilitate price discovery
- Increase likelihood operators will pay closer to true value of spectrum and use it in the most efficient way – face full opportunity cost of underutilising
- Provide transparency and certainty
- Can advantage large operators with deep pockets if not well-designed

# Mechanisms for spectrum assignment

## Types of auction

Options include:

- Ascending – transparent but can favour incumbents and encourage collusion
- Sealed-bid – deters collusion and encourages participation but may result in lower price
- Hybrid (ascending phase then sealed bids) – best of both?
- Package clock – small lots encourage participation, spectrum caps ensure competition protected, can be complex to design and implement

# Spectrum assignment and competition

## Set-asides, spectrum caps and auction design

Experiences of EU countries in 3G auctions highlighted some of the concerns which can arise – lack of participation, collusion, low prices (Klemperer, 2002)

Options to increase competition:

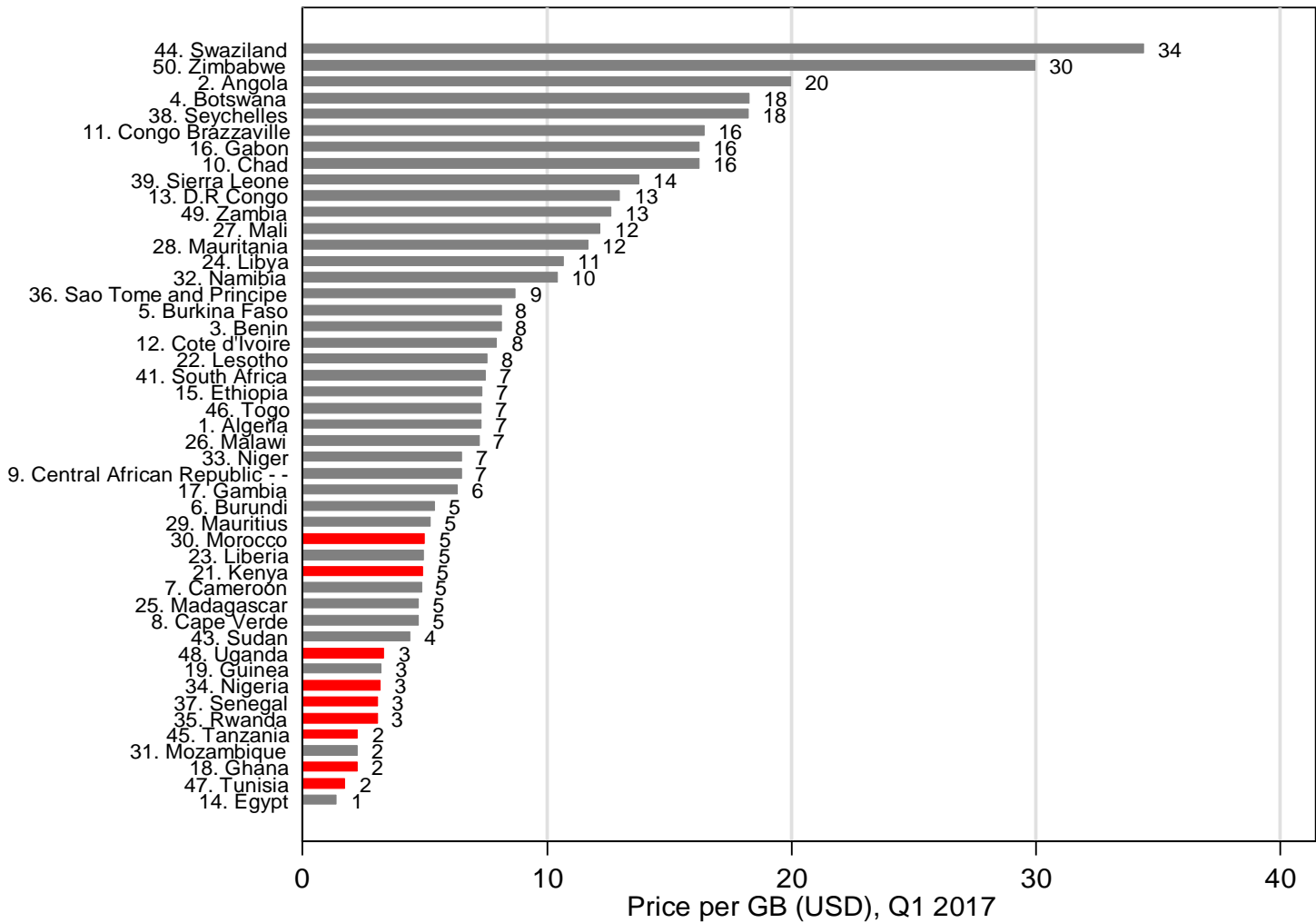
- Mechanisms to prevent collusion – anonymous bidding, sealed bid phase, disaggregated lots
- Set asides – set aside package(s) for smaller operators/entrants. Varying success in practice – will small operators be effective?
- Spectrum caps – set a limit on how much spectrum one operator can hold in a particular band, set of bands (e.g. sub-1GHz) or in total. Widely used at one point, but now declining as more spectrum assigned and LTE requires wider channel sizes.
- Auction design – based on context, number of operators, relative size and financial strength

## Recent spectrum assignments

Country	Spectrum to be assigned	Mechanism	Outcome	Price (USD/MHz/capita)
Ghana	800MHz	Auction	Only one participant – only one lot sold	0.12
	2600MHz	Non-competitive	3 small operators received spectrum – unsuccessful	0.02
Mozambique	800MHz	Auction	No bidders	0.10 (based on reserve price)
Senegal	700MHz, 800MHz	Auction	Failed – collective boycott 2x10MHz of 800MHz + 2x10MHz of 1800MHz to incumbent	0.08
South Africa	700MHz, 800MHz, 2600MHz	Auction	Halted due to legal challenge	0.08 (based on reserve price)
Nigeria	2300MHz	Auction	1x30MHz to 1 operator	0.004
	2600Mhz	Auction	6 2x5Mhz lots to 1 operator	0.01
Kenya	800MHz	Non-competitive	2x10MHz awarded to each of 3 operators	0.03
Rwanda Tanzania Uganda	800MHz	Non-competitive	Unclear, but at least one operator assigned spectrum	Unknown

# Countries which have assigned spectrum have lower data prices

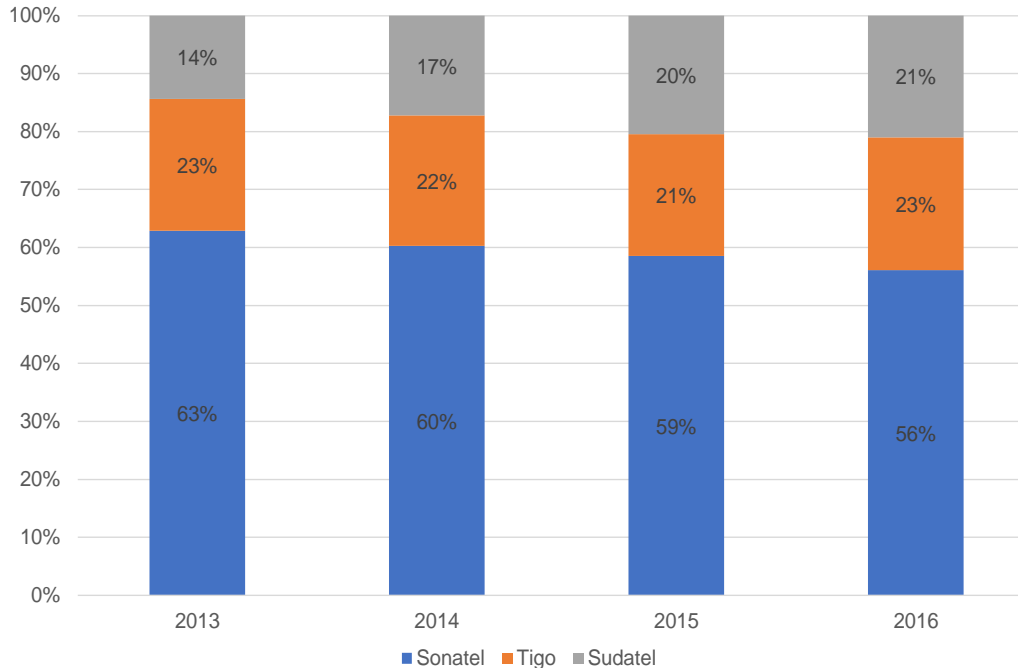
Cheapest price for 1GB basket by country, USD per GB



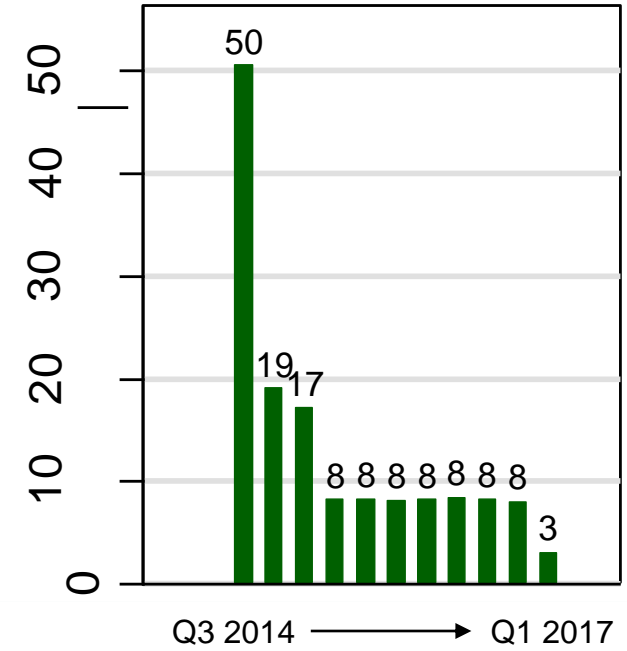
Source: author's own analysis of Research ICT Africa dataset

# Senegal

Market shares



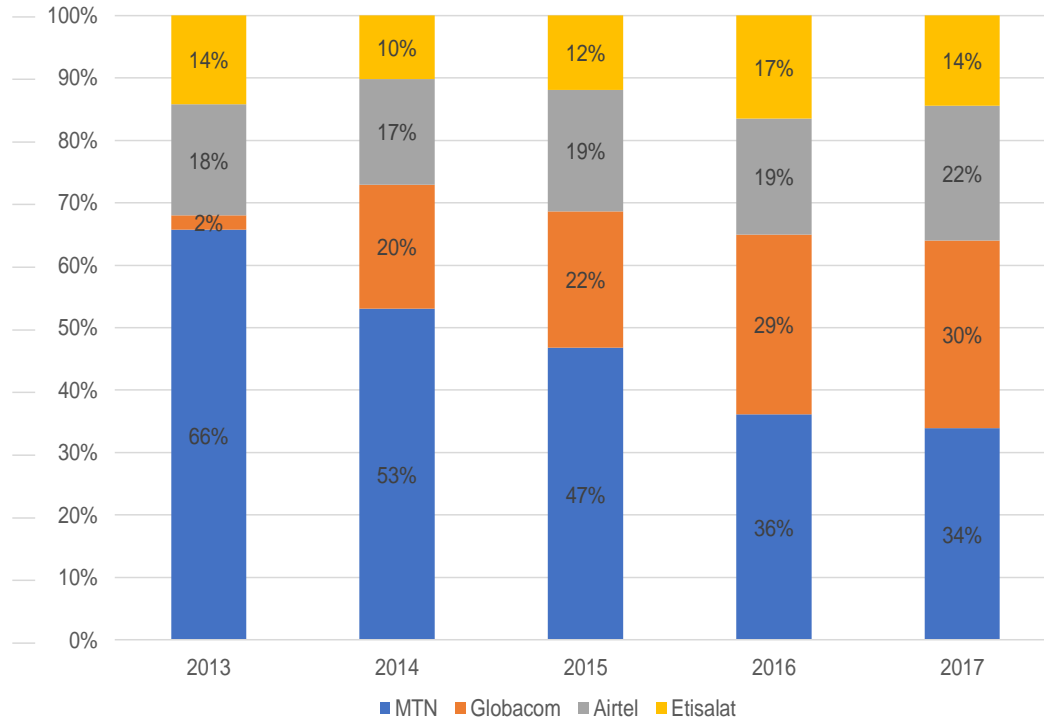
Data prices



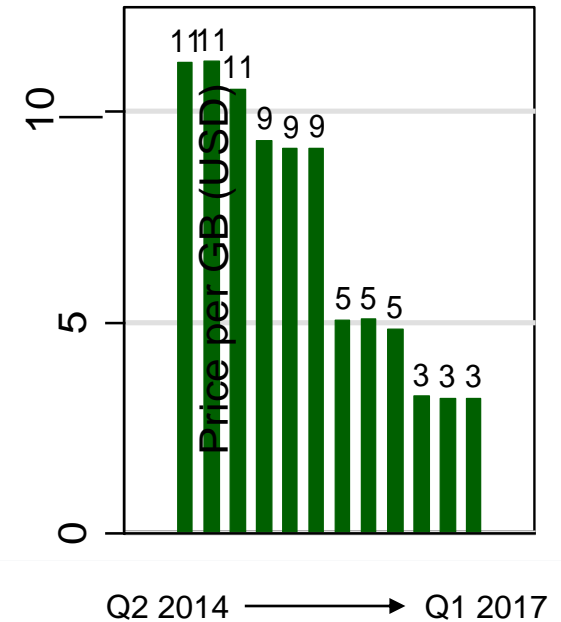
Auction late 2015 – operators jointly boycotted  
39% of spectrum assigned – all to Sonatel  
Market has become slightly more competitive  
Prices have fallen

# Nigeria

Market shares (data subscribers)



Data prices



## Auction 2016

Only one bidder (MTN), 43% of spectrum sold

Other operators cited high reserve price

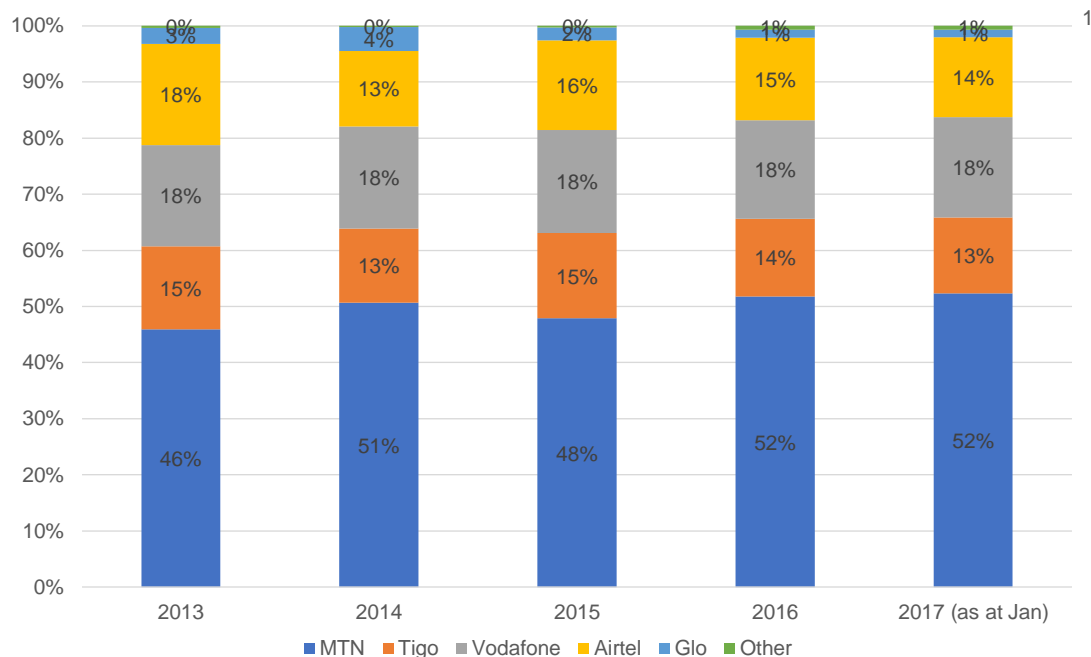
Market has grown more competitive over time

Data prices have fallen steadily

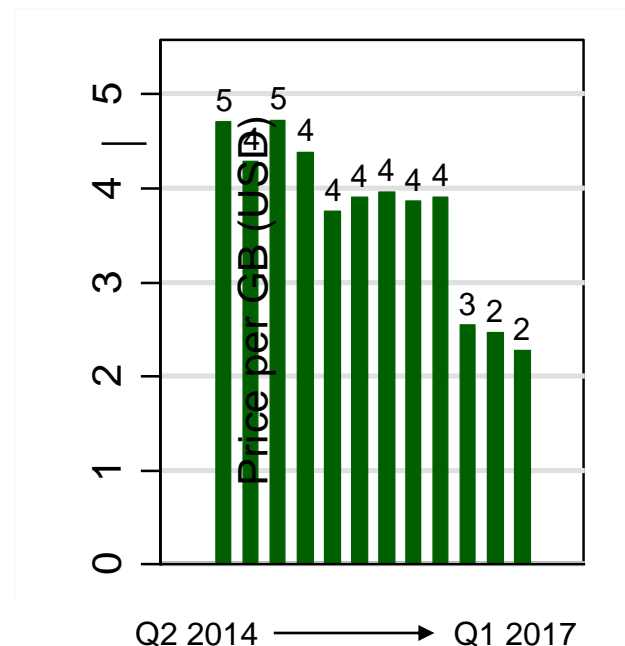


# Ghana

Market shares (data subscribers)



Data prices



## Auction 2015

Only one bidder (MTN), 50% of spectrum sold

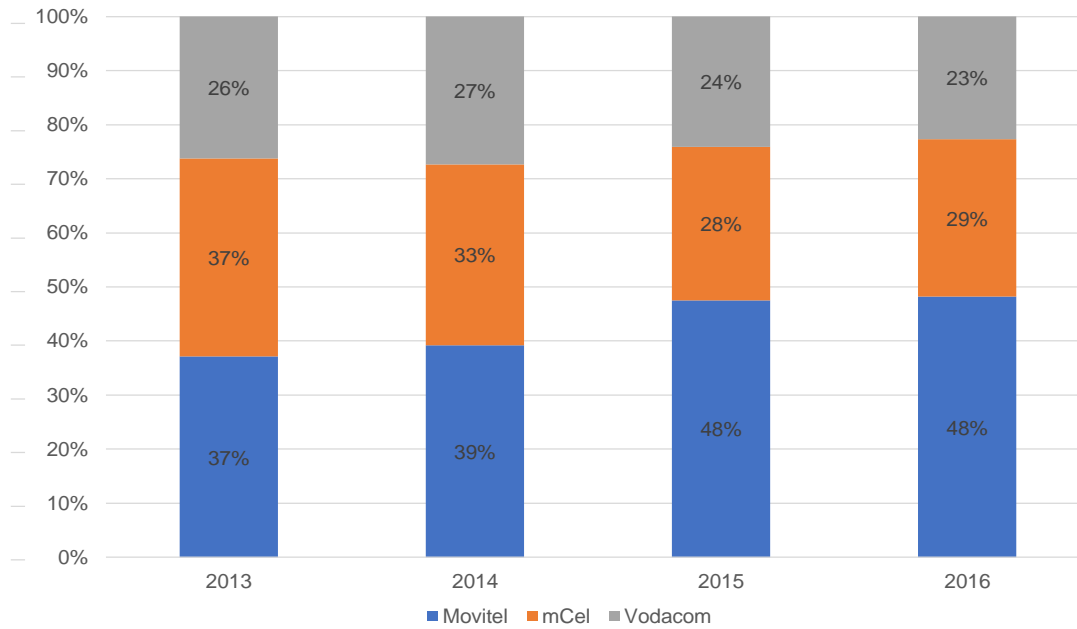
Controversial high reserve price – reaction to failure of previous set-aside for small operators?

Very stable market shares – no real increase in competition, slight increase in market share of largest player (MTN)

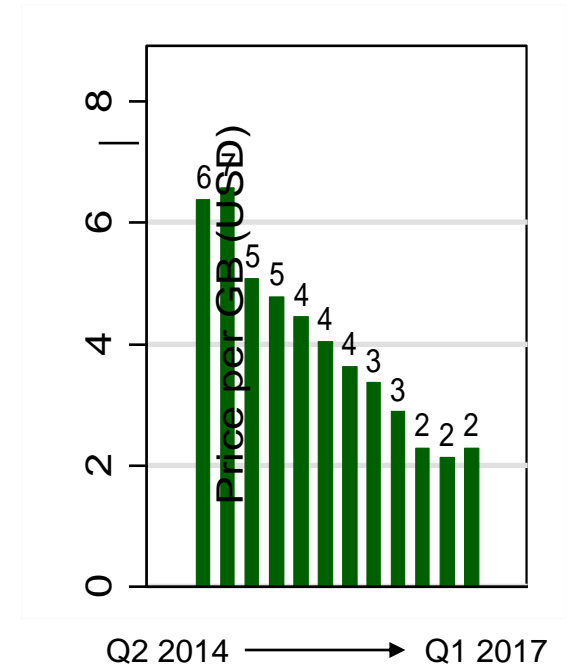
Data prices have fallen and are the lowest in the group

# Mozambique

Market shares



Data prices



Auction attempted 2013

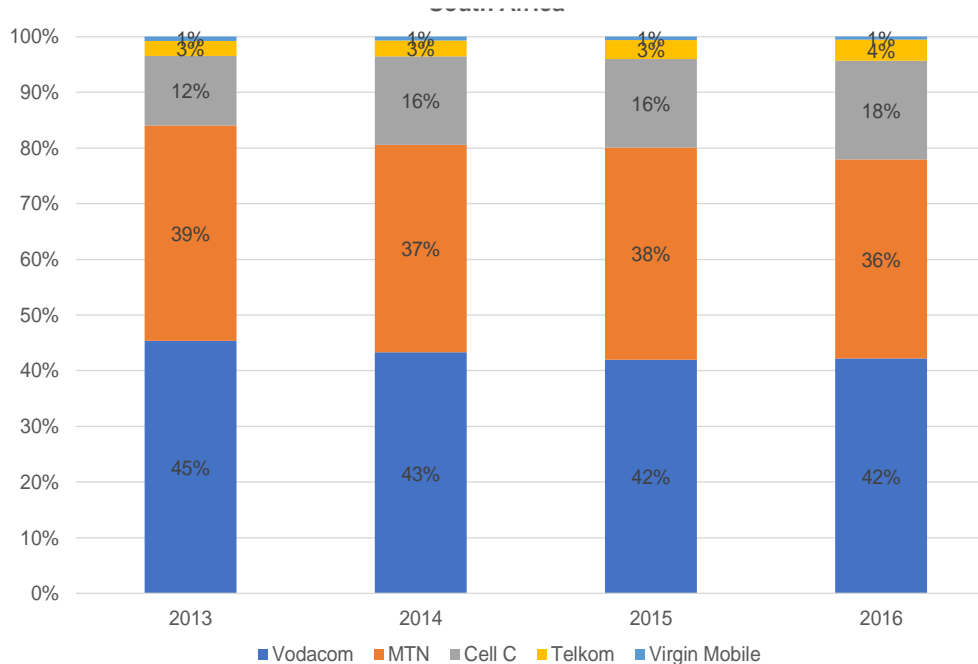
High reserve price, no bidders

Very stable market shares

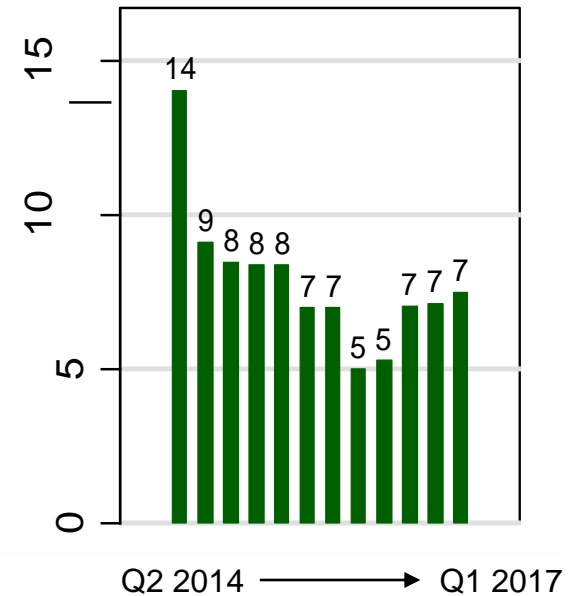
Prices have declined in spite of lack of assignment of 800MHz

# South Africa

Market shares (active subscribers)



Data prices



Attempted auction 2016, halted in courts

No 700MHz, 800MHz or 2600MHz assigned to-date

Stable market shares – smaller operators grown slightly

Data prices fell and then rose again, highest in the group

## Conclusions and recommendations

### How should spectrum be assigned to promote competition?

- Non-competitive mechanisms are opaque and may undervalue spectrum, set-asides for small operators have clear pitfalls
- Auctions used so far have generated higher prices but at the expense of participation/success
- Assigning spectrum (no matter how) seems correlated with lower data prices (causality not proven)
- Competition (measured in terms of market shares) does not appear to have been affected by uncompetitive (incumbent-only) assignments – but effects may become apparent in longer term when entrenched dominance could reverse gains to consumers
- Market mechanisms should not be abandoned, but high reserve prices are likely counter-productive
- Designing auctions to maximise participation and competition for spectrum may have best long-run outcomes