NCC
Impact Assessment of 2013 Mobile Termination Rate (MTR) Regime

Strictly Private and Confidential

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pwc

Contents

1	Executive summary	3
2	MTR impact assessment	7
3	Conclusions	20
4	Appendix	24

Executive summary

The aim of this study is to assess the impact of the 2013 MTR regime

Objectives of this study:

- Assess the impact of the 2013 MTR regime on the Nigerian telecoms market, focusing on:
  - Market / subscriber growth
  - Competition
  - The relationship between on-net and off-net tariffs
  - The evolution of retail tariffs
  - Impact of denominating MTRs in local currency
  - Impact of asymmetric MTR on improving market conditions
- Review whether asymmetric MTRs should be used by the NCC going forward

We looked at the 2013 Nigerian MTR regime and sought to test six hypotheses

Hypotheses
The interconnection regime has allowed the Nigerian telecoms market to continue to develop well from 2013 to 2016
The level of competition has not decreased since the introduction of the 2013 MTR regime
On-net and off-net retail rates will converge if MTRs are set at, or close to, costs
The MTR regime has put downward pressure on retail prices
Denominating MTRs in Naira could cause problems in case of currency devaluation
It is unclear whether asymmetry has had a positive impact on the Nigerian telecoms market

The implementation of the 2013 interconnection regime allowed a positive development of the market

From 2013 to 2016, the Nigerian telecoms market has developed well across a variety of metrics:

- In line with other countries, the Nigerian market has been growing in terms of subscriber numbers since 2013
- Off-net retail voice tariffs had decreased from c. N36.00 in 2009 to c. N17.30 in 2012. Following the 2013 determination prices continued to fall to N12.60
- Over the same time period, off-net and on-net retail voice tariffs have converged. This suggests an increase in market competitiveness (due to reducing switching costs)
- There is mixed evidence on the effect of asymmetric termination rates. It appears that these have had limited impact on new entrants or small operators

The positive impact MTR regulation on market development suggests that the interconnection regime implemented in 2013 has allowed the market to continue to develop well

However, it appears that the single MTR regime, which was irrespective of call origination, could have been misinterpreted by operators abroad (see ITR benchmarking report)

MTR impact assessment

In 2013 the NCC set out a revised interconnection regime which included asymmetry and a converging glide path

Determination of voice interconnection rates (Naira, April 2013 – April 2016)

Voice Termination Rates per minute		Start date
New Entrants and Small Operators		
N6.40	Six Naira Forty Kobo	1st April, 2013
N5.20	Five Naira Twenty Kobo	1st April, 2014
N3.90	Three Naira Ninety Kobo	1st April, 2015
Other Operators		
N4.90	Four Naira Ninety Kobo	1st April, 2013
N4.40	Four Naira Forty Kobo	1st April, 2014
N3.90	Three Naira Ninety Kobo	1st April, 2015

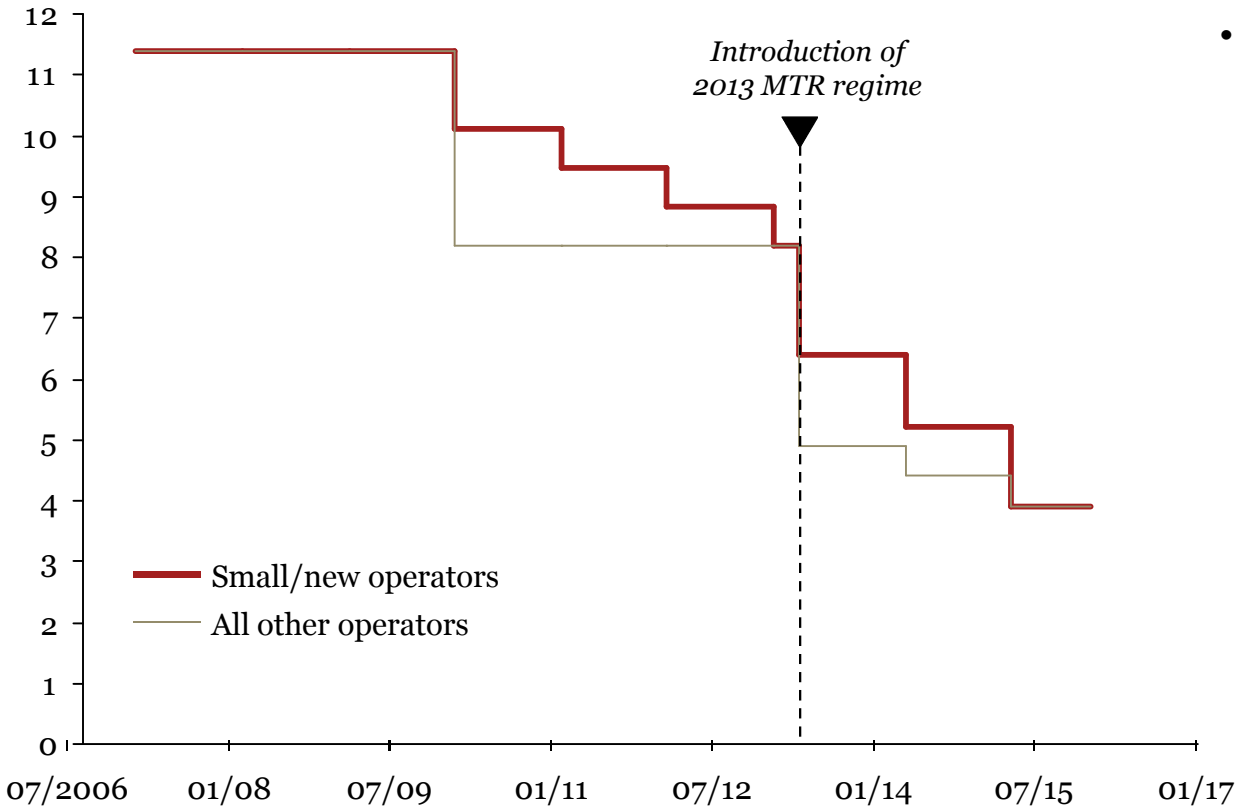
Note:
- A "New Entrant" is defined as newly licensed Operator entering an existing or new market within 0 to 3 years
- Small Operator is defined, for the purpose of this Determination, as an existing Operator with a market share of **0 – 7.5%** in terms of subscriber base
- Same MTR for fixed and mobile calls

Key Points

- The termination rate glide path determined by the NCC in 2013 is shown in the table
- The MTR regime implemented had the following features:
  - was cost based,
  - used a glide path,
  - asymmetric, trending towards symmetric rates
  - denominated in Naira, and
  - used the same charge for fixed and mobile termination
- This report assesses the impact of the determination, evaluating effect of cost-based, regulated, asymmetric termination rates set in Naira for a three year period between April 2013 to April 2016

The MTR glide path set out by the NCC in 2013 had a continuous downward trend towards N3.90

MTRs in Nigeria
(Naira, Jan. 2007 – Jan. 2016)



Sources: NCC

Implications

- While all operators were subject to the same interconnection rates at the beginning and end of the 2013 MTR regime period, small/new operators benefited from a smoother glide path

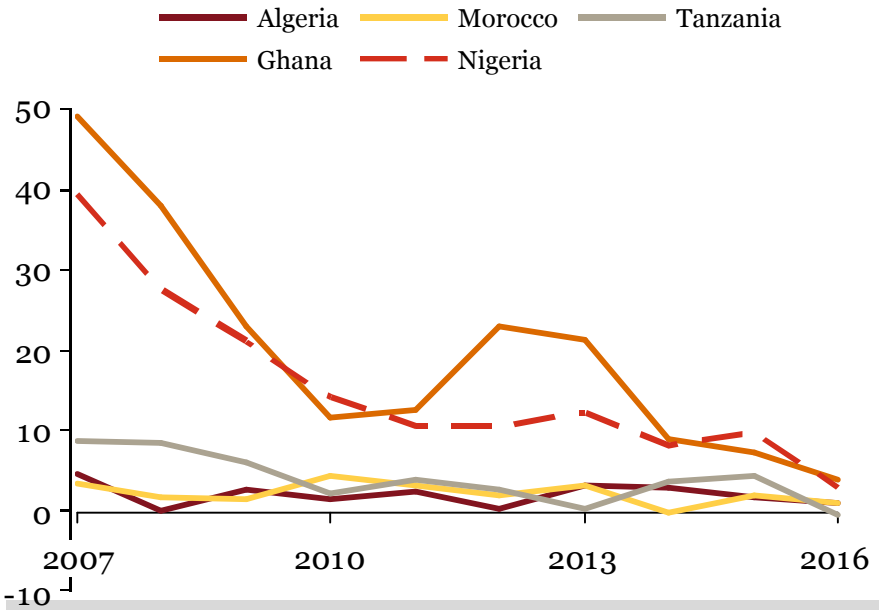
Our approach to assessing the impact of the 2013 MTR regime comprises several strands of analysis

Impact Assessment Approach	MTR Impact Assessment Focus Areas	Concluding Tasks
• Set objectives • Develop hypotheses to be tested • Define data requirements • Identify data sources • Collect data	1. **Market:** Growth of the Nigerian telecoms market from 2009 to 2016 2. **Market share:** Evolution of operators' market shares from 2009 to 2016 3. **Convergence:** Convergence of on-net and off-net retail voice tariffs 4. **Prices:** Evolution of retail tariffs in Nigeria from 2009 to 2016 5. **Local currency:** The effects of determining MTRs in local currency 6. **Asymmetry:** Effects of asymmetry on Nigerian telecoms market. Experience from other countries	• Summarise the main implications from the MTR impact assessment • Draw conclusions regarding the NCC's interconnection regime going forward

Although the focus of this impact assessment is the 2013 interconnection regime we have analysed data going back to 2009 in order to be able to identify potential changes in trends etc. that might have occurred as a result of the 2013 implementation

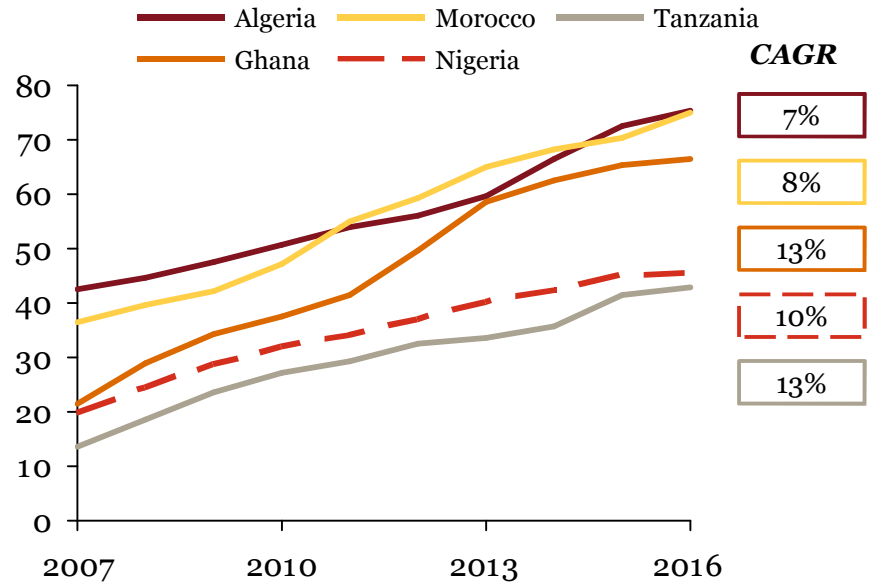
Subscriber numbers and penetration have continued to grow after the introduction of the 2013 regime

Annual Unique Subscribers Growth by Country (%, 2007 – 2016)



- Subscriber growth rates have been falling internationally (as an increasing proportion of the population own mobile phones).
- Nigeria's subscriber growth rate has remained above those of Morocco, Tanzania and Algeria (and, more recently, Ghana)

Market Penetration for Unique Subscribers by Country (%, 2007 – 2016)



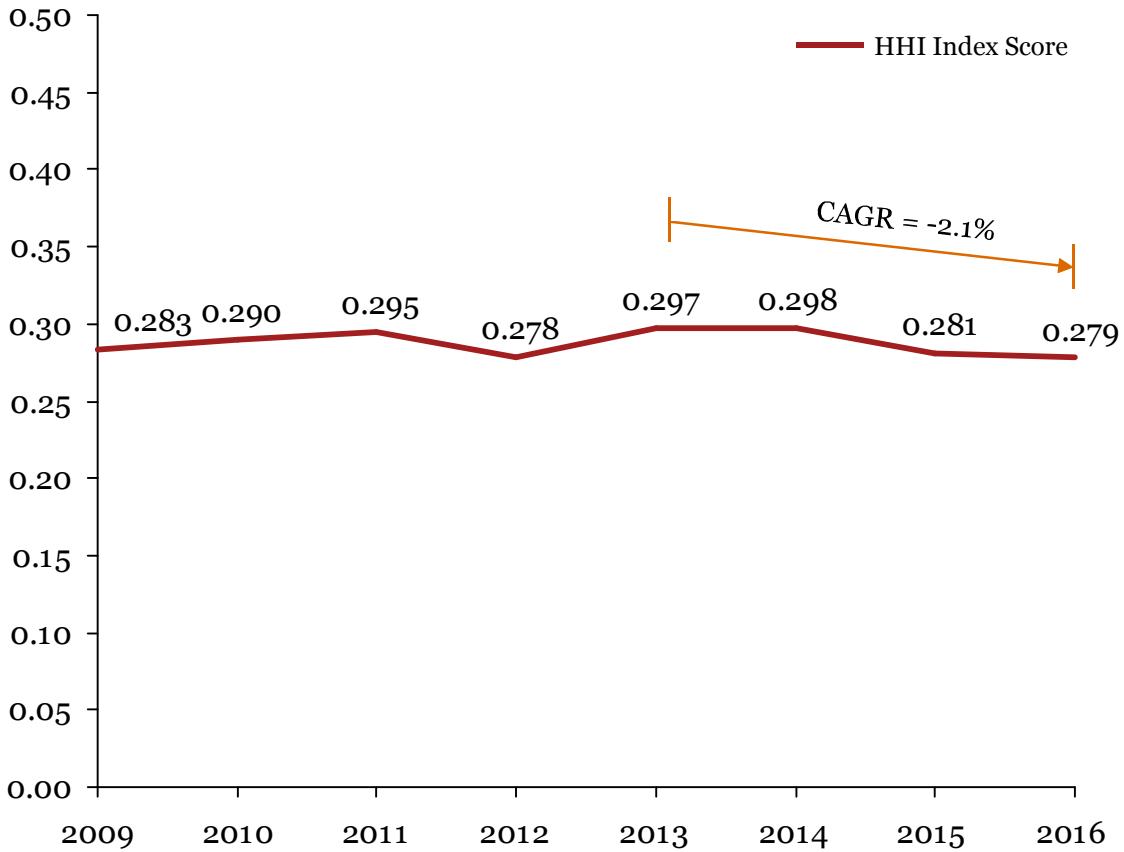
- Subscriber market penetration increased from 20% in 2007 to 45% from in 2016
- Growth of the market penetration in Nigeria was in line with other countries in the region (CAGR around 10%), and higher than in some of the more mature North African markets but lower than in Ghana and Tanzania

It should be noted that the growth in subscriber numbers and penetration occurred despite decreasing incentives for multiple SIM ownership

Sources: GSMA

According to the HHI index the market is moderately concentrated and improved slightly from 2013

Nigeria Mobile Operators Market Concentration (HHI Index, 2009 – 2016)



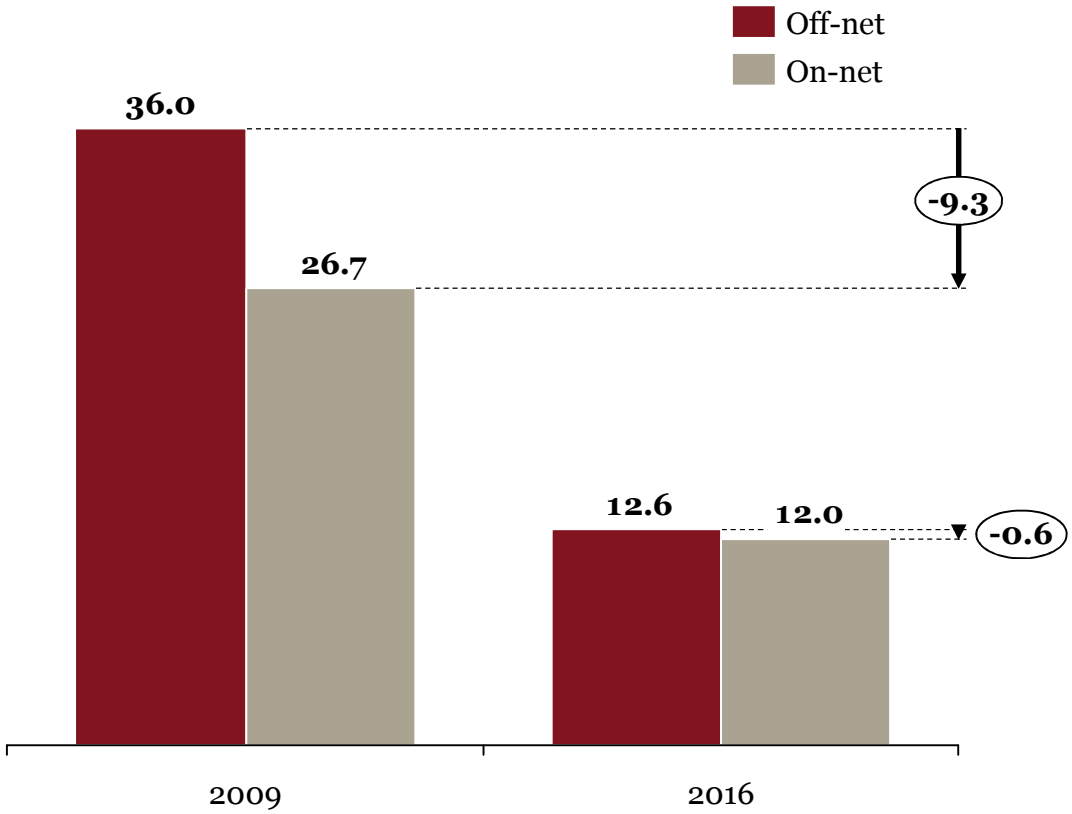
Sources: NCC, GSMA

Key Points

- Herfindahl-Hirschman (HHI) index score measures market concentration, with lower index scores indicating less market concentration and consequently – more competition in the market
- The following operators were included in the market concentration estimation: MTN, Glo, Airtel, Etisalat, others
- Overall, market concentration has remained largely flat, albeit with a slight decrease from 2013 to 2016
- This suggests a slight increase in market competition

Off-net and on-net retail voice tariffs have fallen considerably and converged almost entirely

Average Retail Tariffs for Voice Calls (NGN/min, 2009, 2016)



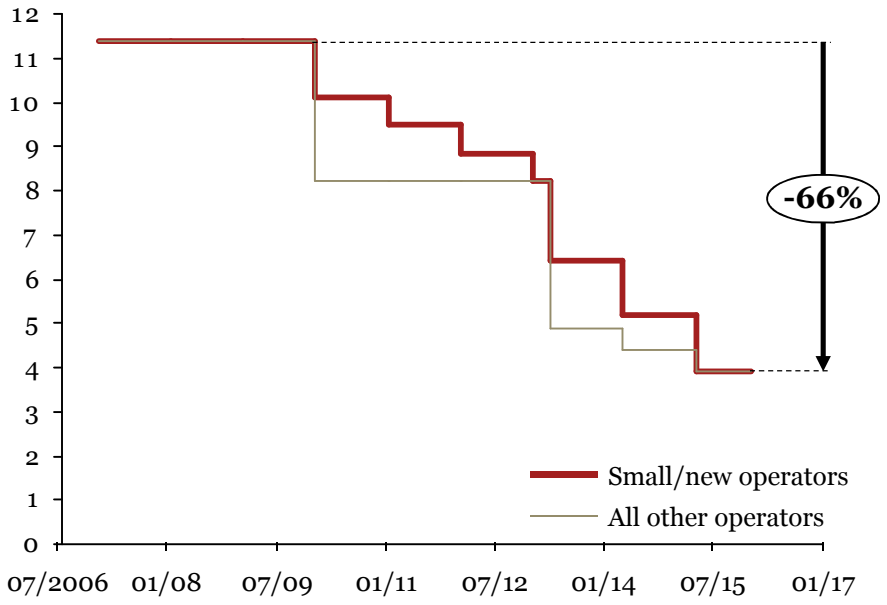
Sources: NCC

Implications

- The average cost of making an on-net call has fallen by 64% from 2009 to 2016 (in nominal terms)
- Whilst the average cost of making an off-net call has fallen by 69% over this time period
- Since 2009, the off-net tariffs have converged to the on-net tariffs which is what one would expect in a world where MTRs equal unit costs
- In Nigeria, this development has been accelerated, and possibly largely driven, by regulatory intervention *(*the obligation on the dominant operator to collapse on-net and off-net differential following the *Determination of Dominance in Selected Communication Markets in Nigeria, NCC, April 2013)*

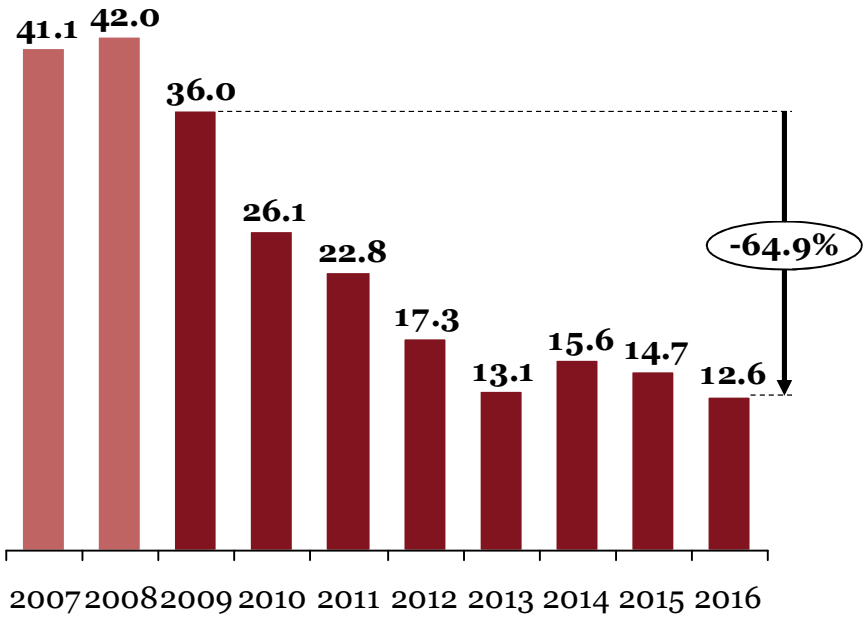
Since 2009, retail prices for voice services have fallen in line with MTRs

MTRs in Nigeria (Naira, Jan. 2007 – Jan. 2016)



- In 2009, the Commission set the MTR to converge to N8.20 by 2012, with an asymmetric benefit to smaller operators
- In 2013, the Commission then set the MTR to converge to N3.90 by 2016, with an asymmetric benefit to smaller operators

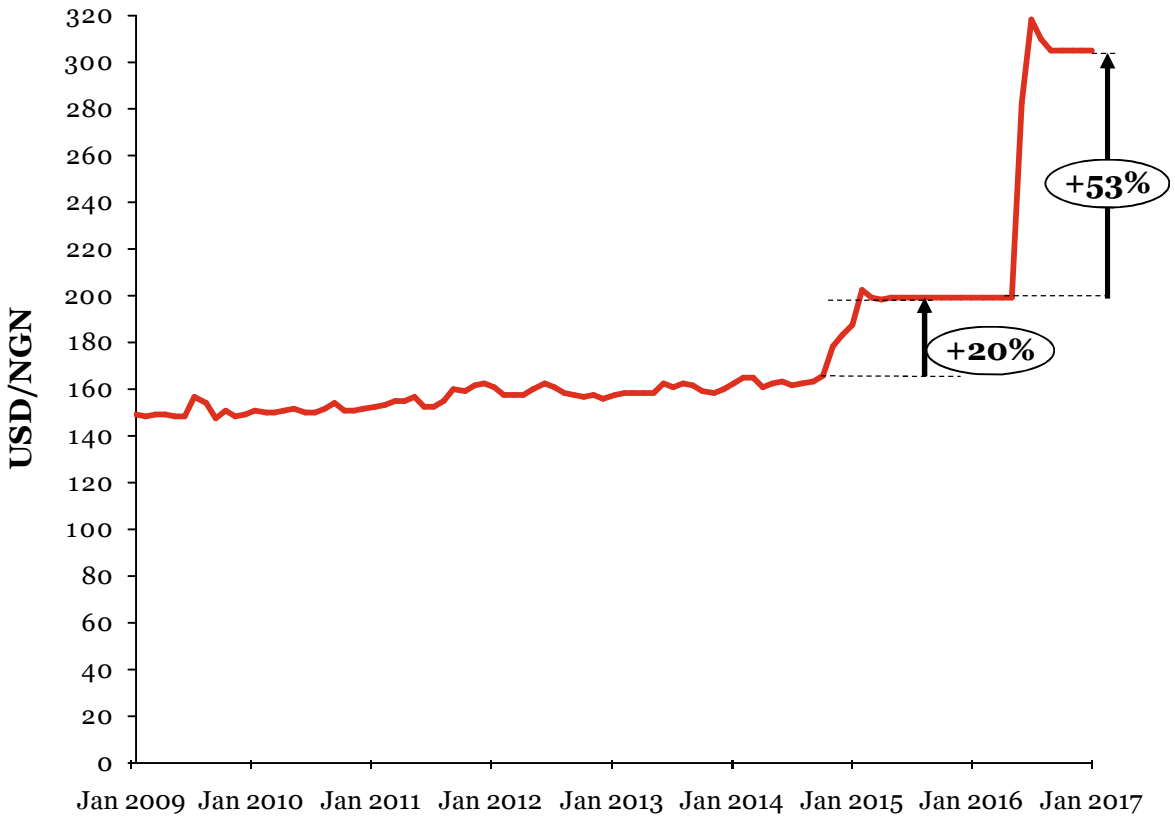
Off-net Peak Voice Retail Tariff in Nigeria (NGN/min, 2007 – 2016)



- From 2009 to 2016, the off-net peak voice retail tariff declined by ~65% from N36.00 to N12.60
- The decrease in voice retail prices since 2009 has been in line with the decrease in MTRs (64.9% and 66% respectively).
- Most of the decline in retail prices occurred from 2008 to 2013, following which prices remained relatively flat (most likely due to cost pressures)

Sources: NCC

However, the depreciating Naira has made it challenging for telecoms to cover the costs of providing services



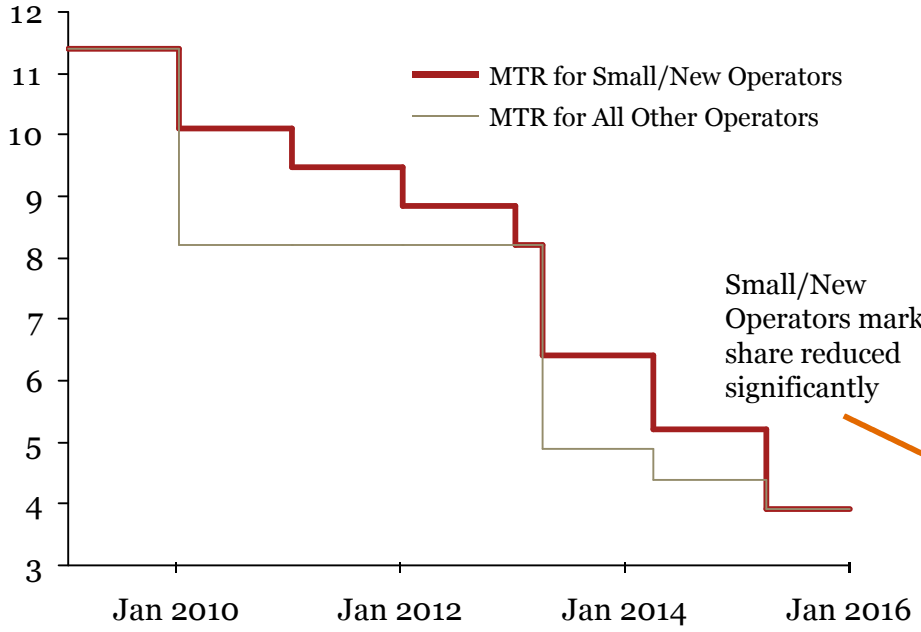
Sources: Bloomberg

Key Points

- In 2016, Naira declined by 34.6% in relation to USD
- This resulted in the following:
  - an immediate cost increase for operators across internationally traded goods, USD denominated loans, USD based co-location, tower charges, and others
  - a gradual increase of labour costs through domestic inflation
- However, a USD denominated MTR would have led to an excessive increase (in Naira terms) of MTRs and upward pressure on retail tariffs

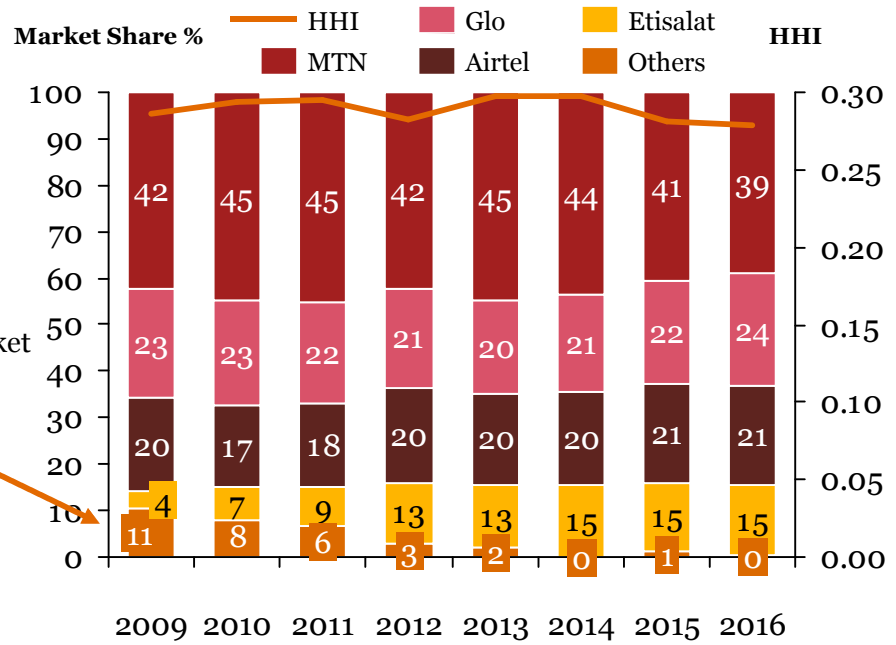
There is mixed evidence on whether asymmetric rates benefitted Nigerian small operators from 2009 to 2016

Asymmetric MTRs in Nigeria (NGN/min, 2009 - 2016)



- In 2009, the Commission set MTRs to converge to N8.20 by 2012, with an asymmetric benefit to smaller operators
- In 2013, the Commission then set MTRs to converge to N3.90 by 2016, with an asymmetric benefit to smaller / new operators

Subscribers Market Share & HHI in Nigeria (%, 2009 – 2016)

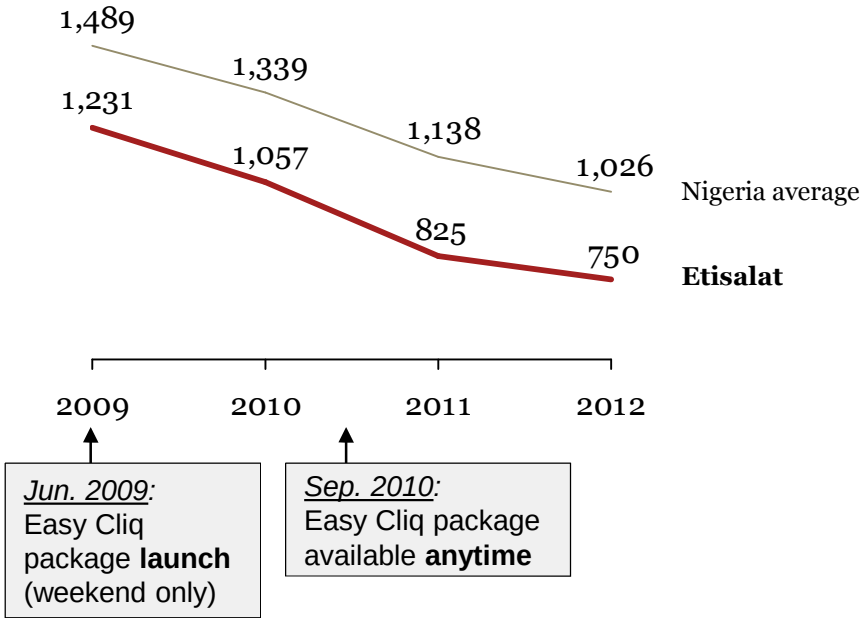


- During the 2009-2012 asymmetric MTR regime, Etisalat increased its revenue market share from 4% to 13%
- The HHI has remained relatively flat since 2009, but the market share of the largest operator has decreased

Sources: GSMA, NCC

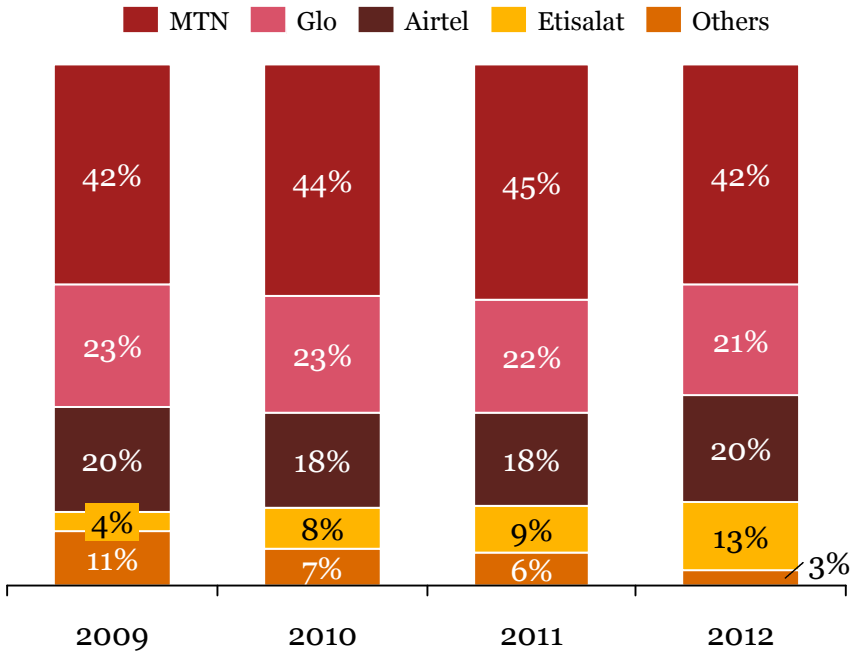
While Etisalat has grown its market share over 2009 - 2012 as the asymmetric MTR regime was implemented…

Etisalat and Nigeria Average Monthly ARPU by Connections (Naira, 2009 – 2012)



- Asymmetry appeared to have allowed Etisalat to launch services at lower price points (compared to Nigerian average)
- In 2009, Etisalat launched the Easy Cliq package which offered the cheapest off-net call rates of 25 kobo/s compared to the industry average of 60 Kobo/s

Nigeria Mobile Telecoms Subscribers Market Share (%, 2009 – 2012)

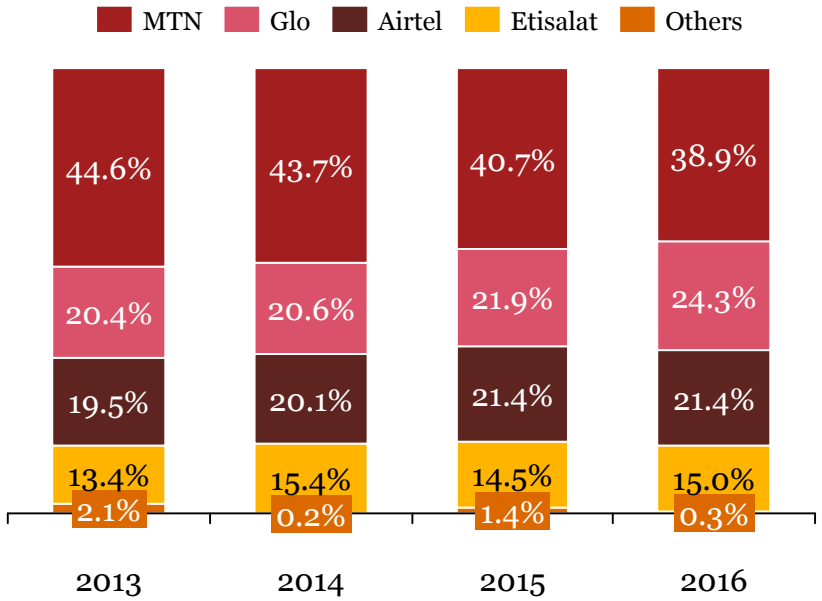


- From 2009 to 2012, Etisalat subscriber market share increased from 4% to 13%
- Asymmetry potentially enabled Etisalat to competitively price its services in order to drive uptake and market share

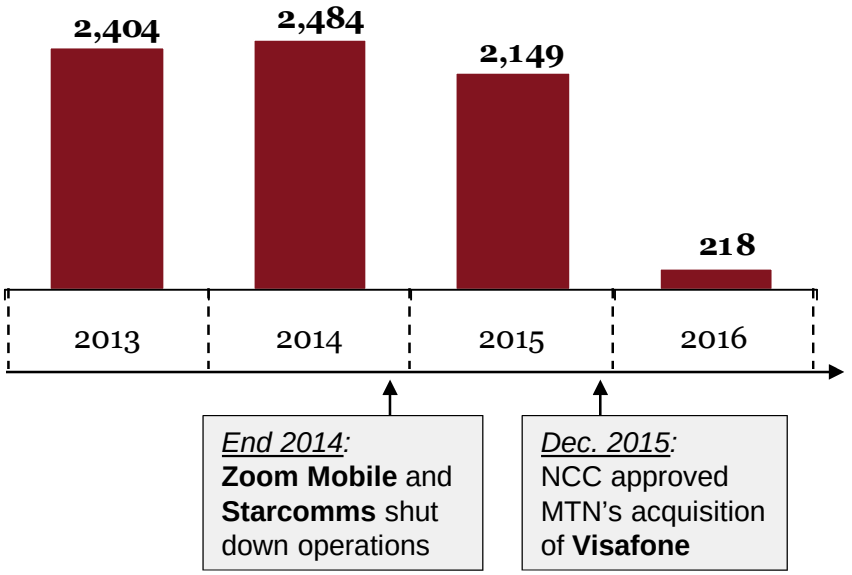
Sources: NCC, GSMA

...there is no clear evidence that asymmetry supported an increase in market competition over 2013 - 2016

Nigeria Mobile Telecoms Subscribers Market Share (%, 2013 – 2016)



Evolution of CDMA Operators and Number of CDMA Subscribers (000s, 2013 – 2016)



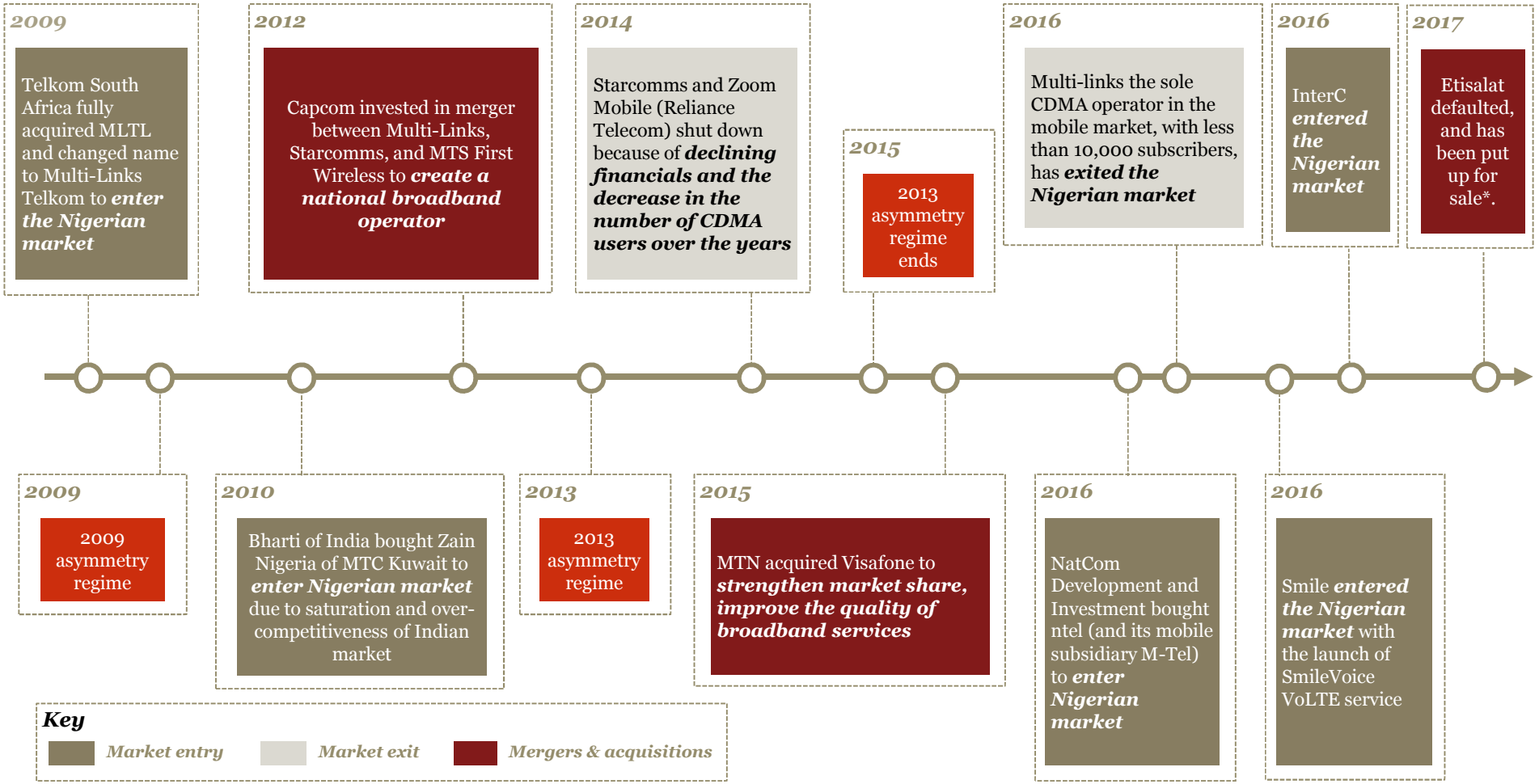
- In 2013, the operators benefitting from the 'small operator' MTR rate only had 2.1% share of the Nigeria subscriber market
- Asymmetry was not applicable to MTN, Glo, Airtel and Etisalat as their subscribers market shares exceeded the 7.5% threshold to be considered a 'small operator'

There is no clear evidence that asymmetry enabled small CDMA operators to develop in the market as:

- Most CDMA operators lacked the scale to leverage cost savings gained from the 2013-2016 asymmetric MTR regime
- Zoom Mobile and Starcomms exited the market in 2014
- MTN acquired Visafone in 2015

Sources: NCC, GSMA

Moreover, three 4G operators have recently entered the Nigerian telecoms market in the absence of asymmetry



Sources: Buddecomm, TeleGeography, The Financial Times

** Press reports suggest that two bids were received on 16/01/2018*

Conclusions

MTR regulation should be upheld going forward. It is unclear whether asymmetry would have positive impact

From 2009 to 2016, the Nigerian telecoms market has developed well across a variety of metrics…

- The Nigerian market has been growing since 2013, with a CAGR of around 10% in subscriber terms
- From 2009 to 2016, off-net retail voice tariffs have decreased from N36.00 to N12.60
- Over the same time period, off-net and on-net retail voice tariffs have converged. This is compatible with cost based termination rates, and counteracts multiple sim ownership
- There is mixed evidence on the effect of asymmetric termination rates. It appears that these have had limited impact on small operators

…however, asymmetry might not necessarily improve market competition compared to symmetric MTRs

- Although asymmetry appeared to initially made a positive impact, it did not last with most of small operators exiting the market. Post asymmetry small 4G-only operators were able to enter the Nigerian market in 2016
- Considering the past development of the Telecom industry it appears that asymmetry will have limited impact on small operators
- Evidence is mixed regarding whether asymmetry is effective in supporting small operators' growth in other markets comparable to Nigeria

Given the proven positive impact MTR regulation has had on the Nigerian telecoms market, the NCC should continue to regulate MTRs going forward

It is unclear that asymmetric rates had impact on market competition with most of small / new operators existing the market prior to 2016 and new entrants coming in post asymmetry

The NCC's proactive approach to MTR regulation is in line with regulatory insights / international precedent

Setting termination rates by the NCC

- Call termination represents a bottleneck (a market in which each operator has SMP)
- The NCC does not leave MTRs to bilateral negotiations
- Instead, it takes an active role in setting MTR based on unit costs (using LRIC+)
- The development of MTRs is based on the evolution of unit costs over time, and glide path adjustments

Aligning with what is done elsewhere

- Regulators around the world have moved towards cost based regulation of MTRs
- A number of regulators have implemented asymmetric MTRs
- Glide path approaches have also been used by many regulators (in order to avoid excessive one-off adjustments)

The Nigerian market has continued to develop well

- Since the NCC moved towards cost based interconnection rates in 2009 and its review in 2013, the market has seen strong growth, prices have fallen, and the asymmetry between on-net and off-net calls has decreased
- New entrants have come to the market in absence of asymmetry in 2016

Re-cap: We have assessed 6 hypothesis in relation to the input of the 2013 MTR regime

Hypotheses	Findings
The interconnection regime has allowed the Nigerian telecoms market to develop well from 2013 to 2016	From 2009 to 2016, the Nigerian telecoms market has developed well across a variety of metrics, including subscriber growth and market penetration
The MTR regime has increased market competition	The HHI Index suggest that market concentration has decreased slightly following the adoption of new termination rates in 2013, increasing market competition and decreasing concentration
On-net and off-net retail rates will converge if MTRs are set at, or close to, costs.	On-net and off-net retail voice tariffs have converged from 2009 to 2016, which suggests MTRs have been set at, or close to, costs. This convergence tends to reduce incentives for undesirable multiple sim ownership
The MTR regime has put downward pressure on retail prices	Over a period of time, retail prices for voice services have declined in line with MTRs
Denominating MTRs in Naira could cause problems in case of currency devaluation	Naira depreciation made it challenging for Telecom operators to cover costs, but a USD denominated MTR would have led to an excessive increase (in Naira terms) of MTRs and upward pressure on retail tariffs
It is unclear whether asymmetry has had a positive impact on the Nigerian telecoms market	There is mixed evidence as to whether asymmetric MTR regimes have led to an increase in market competitiveness from 2009 to 2016 with operators exiting in asymmetric regime and entering in the symmetric regime

Appendix

Appendix: International Experience

In this appendix, we are providing information on interconnection regimes in other countries, specifically in relation to:

- Whether interconnection rates are regulated based on costs
- Whether interconnection rates are asymmetric
- Market characteristics (e.g. market concentration, market shares of operators, etc.)

This is done with the aim of comparatively assessing **whether MTR regimes have improved market conditions** where implemented

International regulators tend to set cost based MTRs, with only a few adopting a Bill-and-Keep (BAK) regime

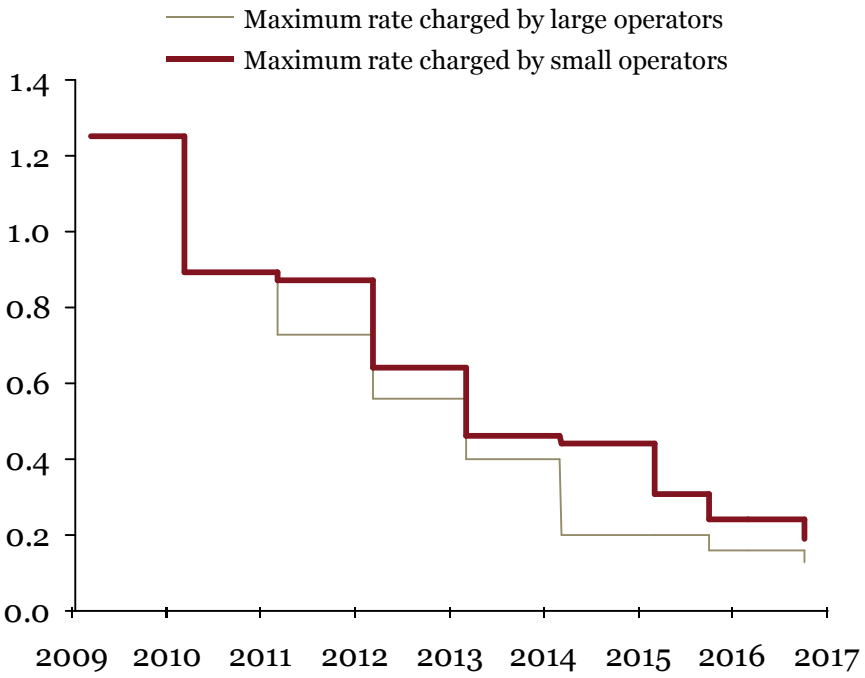
	Example countries	Rationale for setting up the regime	Method used to set up the regime
MTR regime	• Algeria • Argentina • Benin • Botswana • Colombia • Germany • Morocco • Niger • Peru • Poland • Senegal • Sweden • Tanzania • UK • …	• *The purpose of setting cost based MTRs, is* ***to avoid cross subsidies*** *and to* ***remove incentives to turn off phones***. • ***Foster a competitive market*** by lowering on-net – off-net price differentials to ensure consumers have less incentive to switch operators • Drive retail rates lower ***to benefit consumers*** • Adopt asymmetry policies to ***help smaller players to survive*** and ***tackle the problem of imbalance of payments*** • Bring mobile interconnection rates closer to fixed interconnection rates, which will ***enhance fixed-mobile competition*** • ***Increase off-net traffic*** • Help to ***resolve disputes*** among operators • Essential to ***adhering to international mandates***	• Mostly cost-based approach • Some countries such as Ghana adopts a combination of cost-based and benchmarking approaches

BAK regime	• US
	• Canada
	• Mexico
	• Hong Kong
	• Singapore
	• New Zealand
		• ***Avoid high fixed administration and regulatory costs*** relative to the benefits that would be gained if there were no transactions costs associated with identifying and setting theoretically optimal MTRs in small markets
		  o Avoid resources in modelling
		  o Avoid resources in lengthy disputes
		• Operators would be ***recovering all their costs from their own retail customers***
		• Gives the operators strong incentives to both ***increase their customer base and encourage traffic***	

Sources: Regulators reports

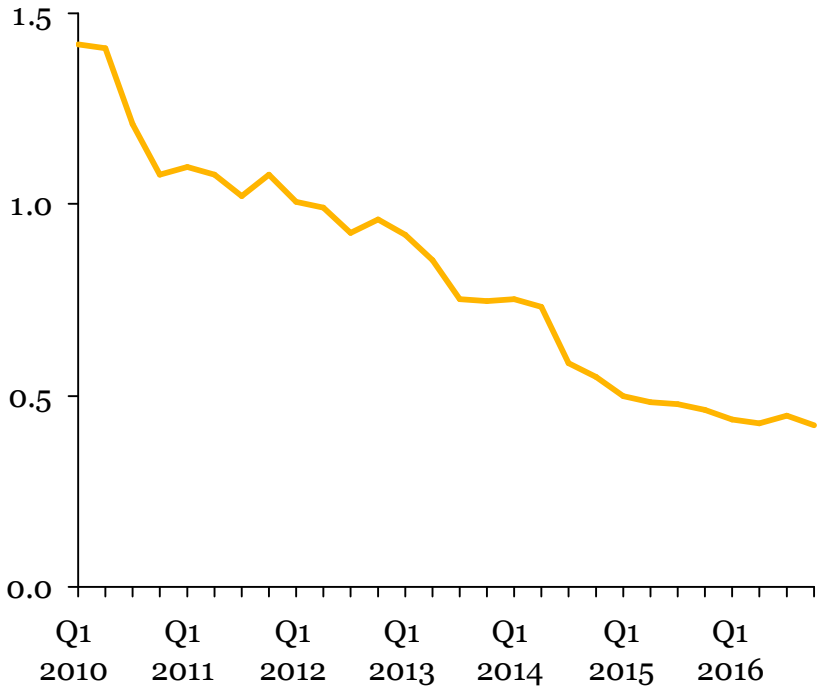
South Africa's voice tariff appear to have declined in-line with MTRs

MTRs in South Africa (ZAR/min, 2009 – 2016)



The Independent Communications Authority of South Africa (ICASA) regulates MTRs based on the operators' long-run incremental costs (LRIC) and has reduced MTRs over time

Average voice revenue per minute in South Africa (ZAR/min, 2010 – 2016)

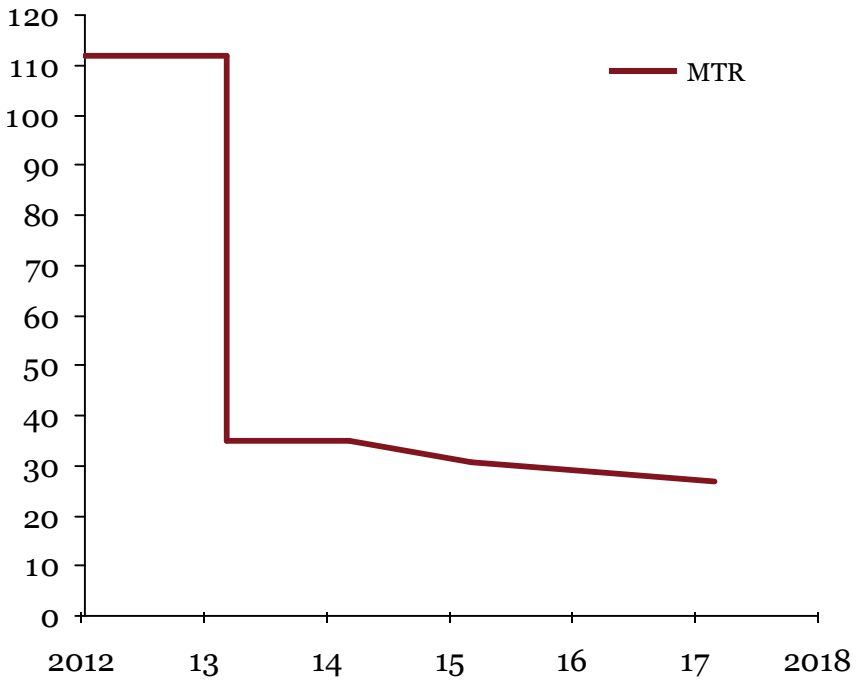


Average voice revenue per minute has fallen over time in line with the reductions in MTR, suggesting that regulating MTRs has led to lower average call charges for consumers

Sources: GSMA, ICASA Call termination regulation Sep 2014 , Buddecomm, Telegeography (Q2 2015), TeleGeography, Ovum

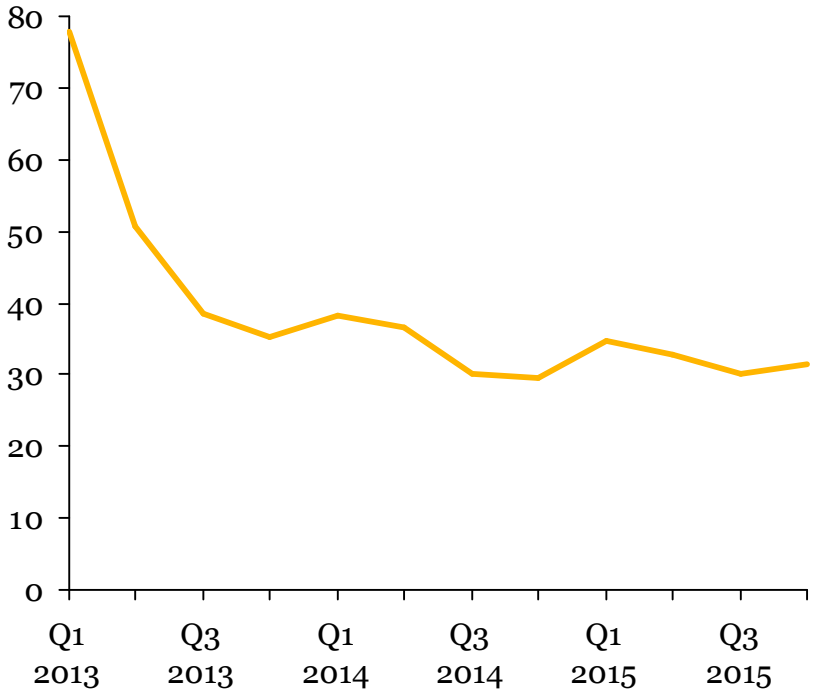
Tanzania implemented a big step change reduction in 2013, followed by a gradual decrease in MTRs

MTR in Tanzania (TZS/min, 2009 – 2017)



- In March 2013 the Tanzanian regulator reduced MTRs by 68.8% to TZS34.92 per minute
- The new glide path will end in 2017 at TZS26.96 per minute

Average voice revenue per minute in Tanzania (TZS/min, 2013 – 2015)

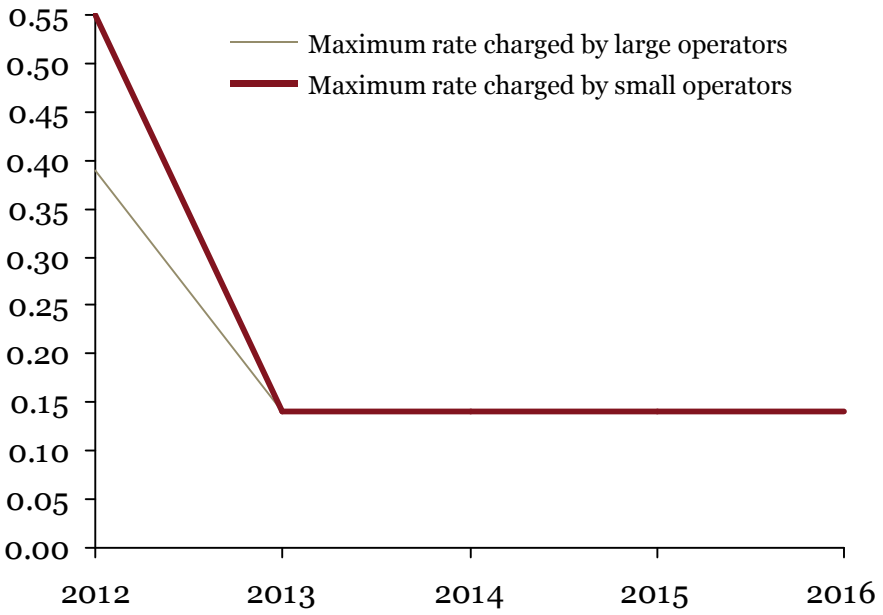


Average voice revenue per minute has fallen over time in line with the reductions in MTR. However, it is noted that the reductions in MTR have been rather irregular during this period

Sources: Ovum, Buddecomm, GSMA

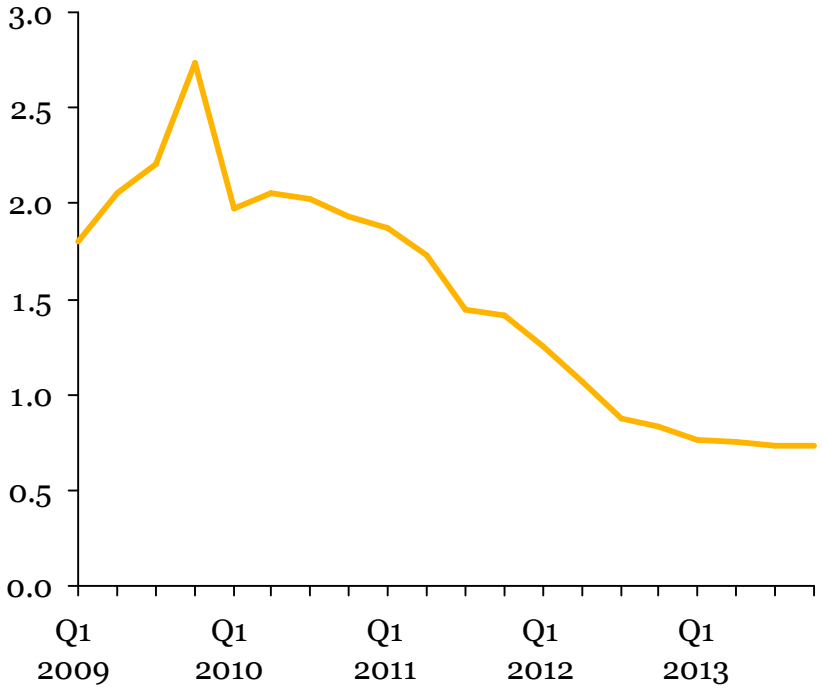
Morocco's regulation seems to have lowered voice tariffs, although only one MTR reduction recently occurred

MTR in Morocco (MAD/min, 2009 – 2016)



The Moroccan regulator (Agence Nationale de Reglementation des Telecommunications, ANRT) has reduced the MTR for many years, although recently MTRs appear to have been frozen

Average voice revenue per minute in Morocco (MAD/min, 2009 – 2013)



Average voice revenue per minute has fallen over time in line with the reduction in MTR. However, it is noted that the reduction in MTR occurred only during the start of this time period

Sources: Ovum, GSMA

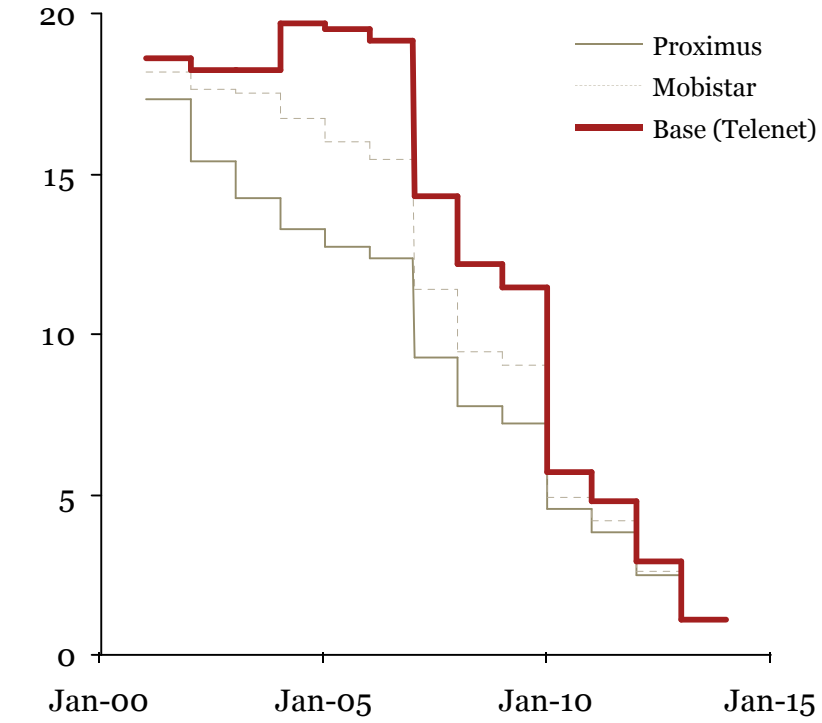
Many countries in Africa and the Middle East set symmetrical MTRs

Country	Date of last market analysis	Cost methodology used	Asymmetry between MTRs
Egypt	2003	Cost-plus	Asymmetrical
Kenya	August 2010	BU-LRIC	Symmetrical
Morocco	December 2013	TD-LRIC	Symmetrical from January 2013
Nigeria	March 2013	LRIC+	Symmetrical as of April 2015
Oman	December 2013	LRIC	Symmetrical
Saudi Arabia	September 2010	BU-LRIC	Symmetrical from 2008
South Africa	October 2014	LRIC+	Asymmetrical
Tanzania	March 2013	FL-LRIC	Symmetrical
Turkey	December 2012	LRIC	Symmetrical
Uganda	May 2012	LRIC	Symmetrical

Source: Ovum

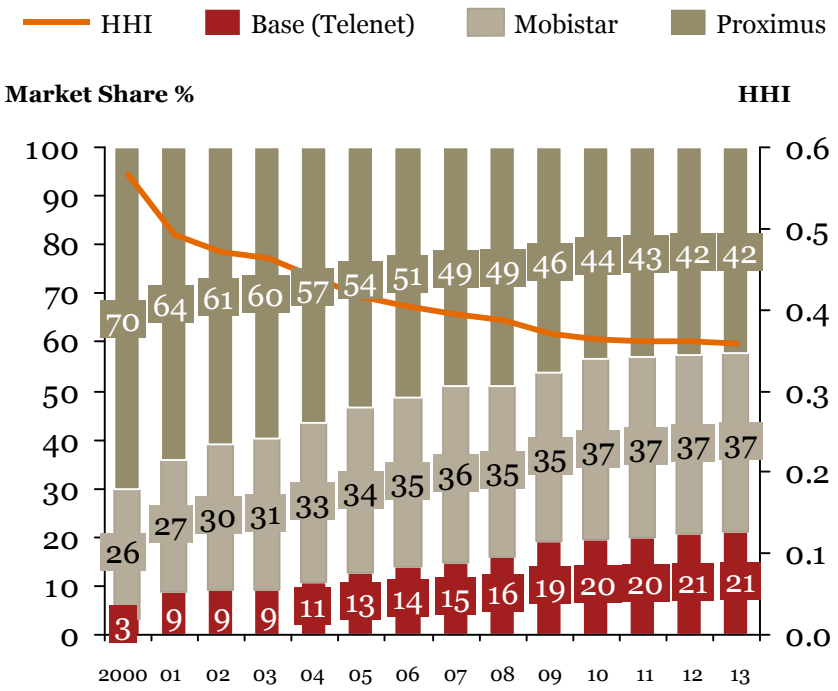
In Belgium, there is a correlation between asymmetry and the small operator's market share growth

Asymmetric MTRs in Belgium (EUR Cents/min, 2001 - 2013)



- Asymmetry was used from 2001 to 2013, when rates converged

Revenue Market Share & HHI in Belgium (%, 2000 – 2013)

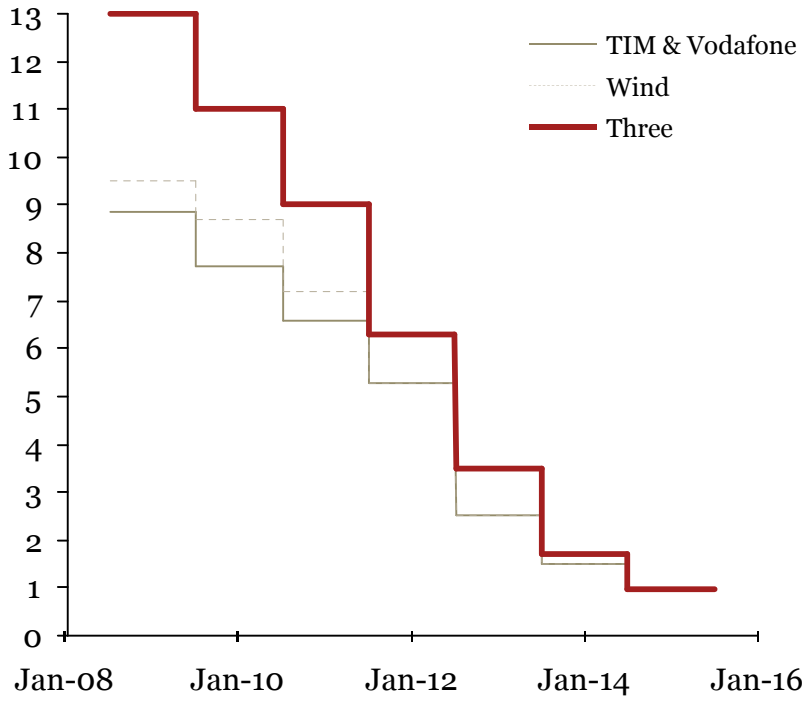


- During the 2001-2013 asymmetric MTR regime, Base and Mobistar managed to increase their revenue market shares by 18pp and 11pp respectively

Sources: IBPT, GSMA

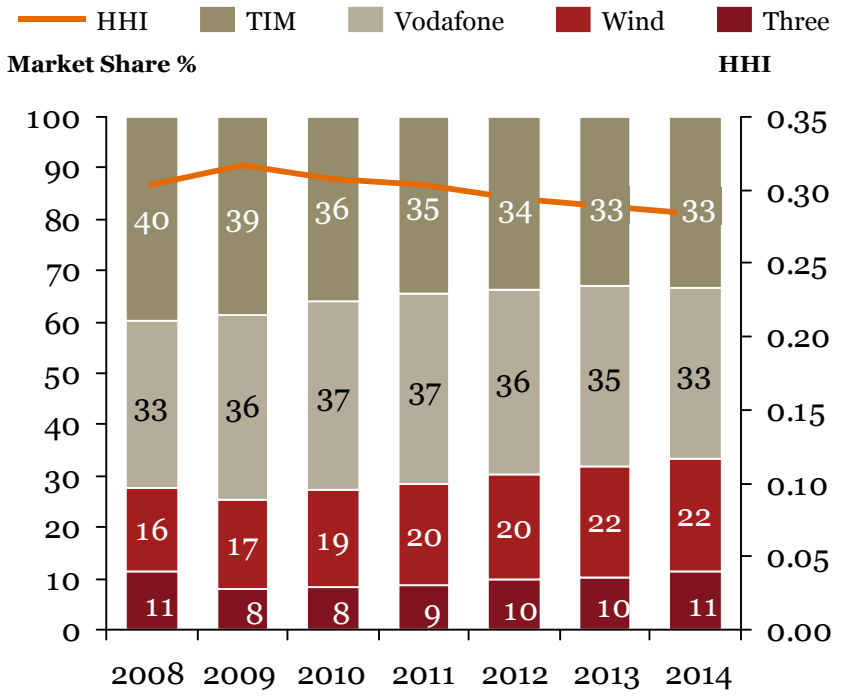
Similarly, in Italy, asymmetry appeared to have helped small operators gain more revenue market shares

Asymmetric MTRs in Italy (EUR Cents/min, 2008 - 2014)



- Asymmetry was used from 2008 to 2014, when rates converged

Revenue Market Share & HHI in Italy (%, 2008 – 2014)

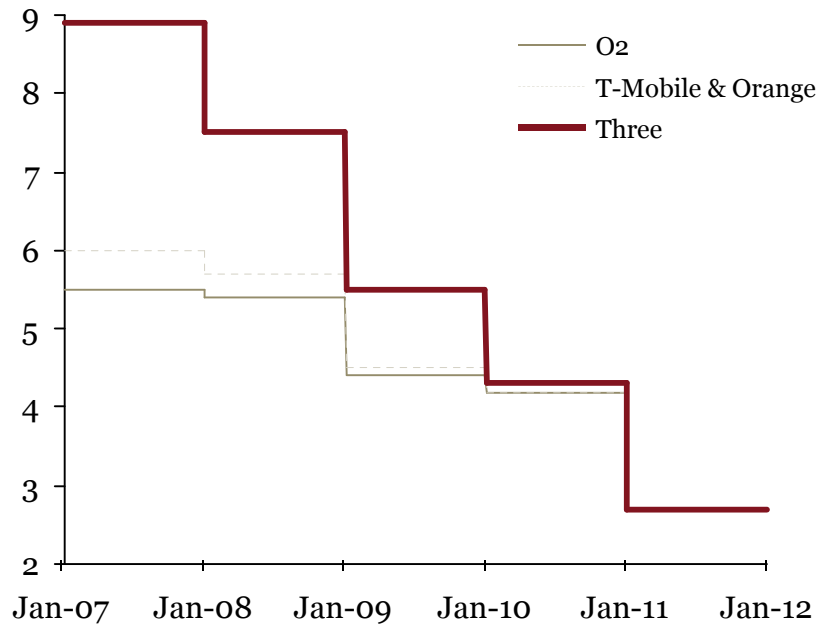


- The asymmetric MTR regime enabled Wind and Three to increase their revenue market shares in the Italy telecoms market

Sources: IBPT, GSMA

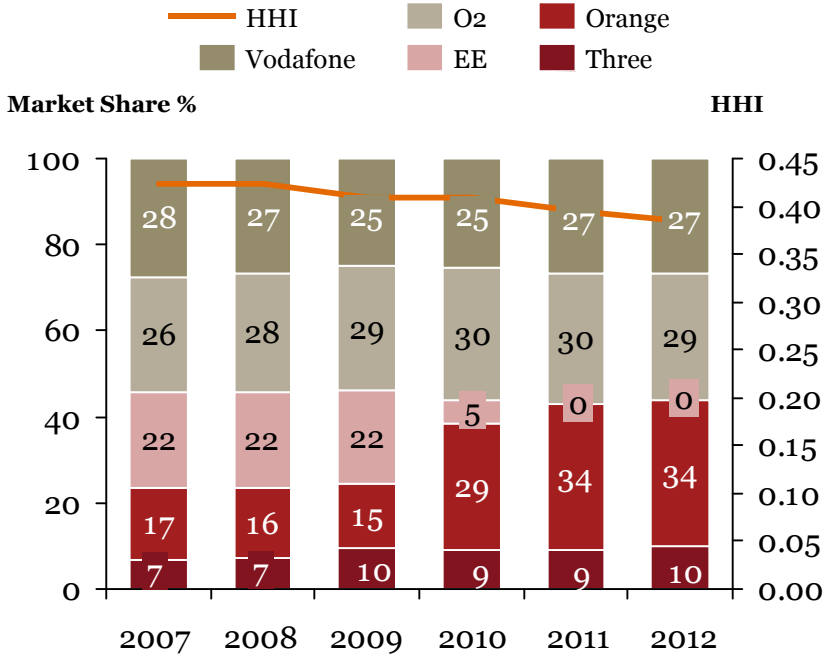
However, in the UK, it is not clear whether asymmetry correlates with the growth of small operators

Asymmetric MTRs in UK (£ Pence/min, 2007 - 2012)



- Ofcom introduced asymmetric MTRs in 2007, with rates converging in 2011

Revenue Market Share & HHI in the UK (%, 2007 – 2012)

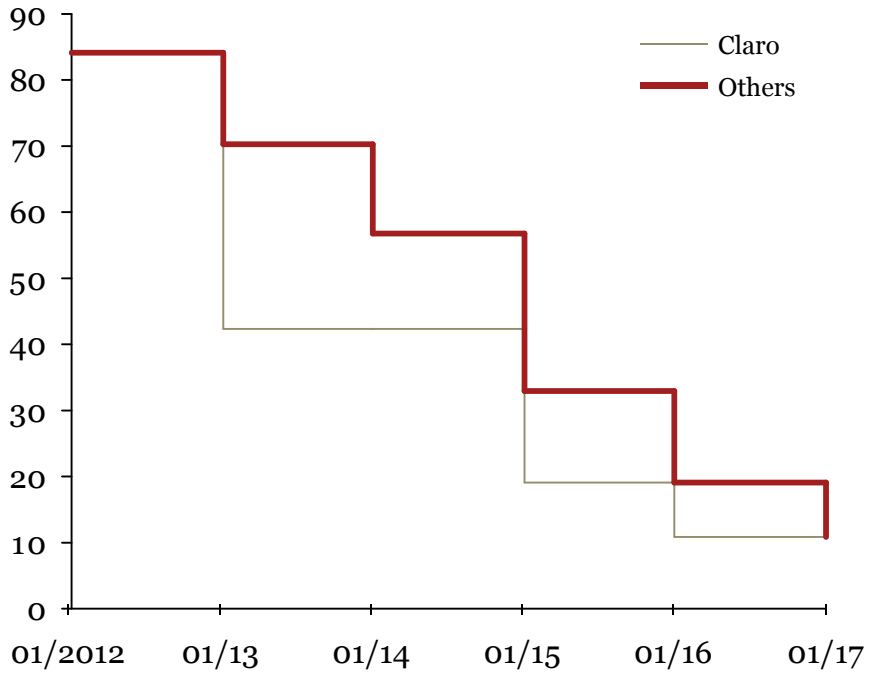


- Three benefited from the asymmetric MTR regime from 2007 to 2011 and managed to increase its market share from 7% to 10%

Sources: Harbord, D. and Hoernig, S., Welfare Analysis of Regulating Mobile Termination Rates in the UK, GSMA

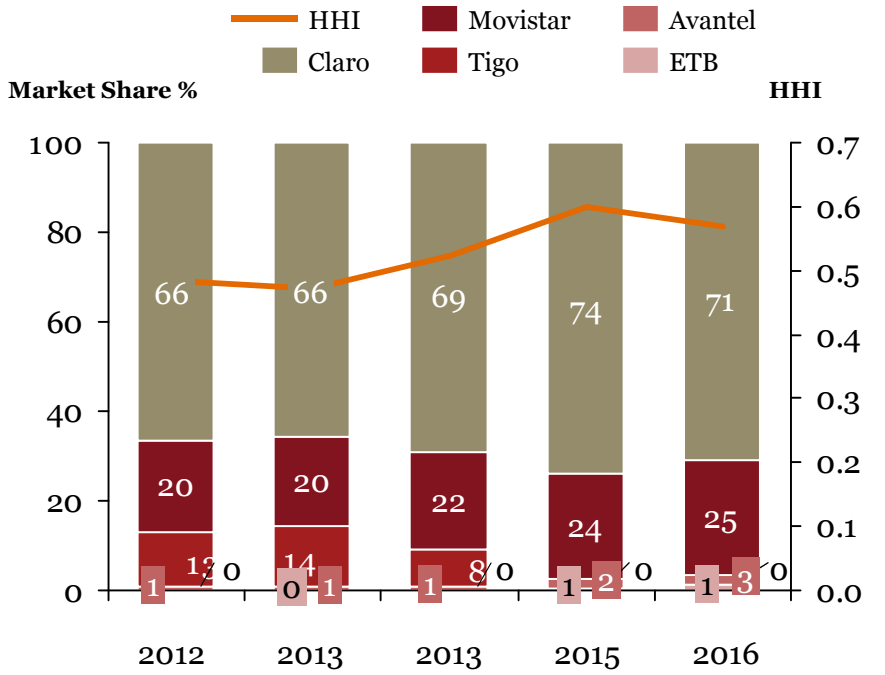
In Colombia, there is no correlation between asymmetry and small operators' market share growth

Asymmetric MTRs in Colombia (COP/min, 2012 - 2017)



- In November 2012, the CRC introduced an asymmetry regime to limit Claro's mobile market dominance

Revenue Market Share & HHI in Columbia (%, 2012 - 2016)



- Despite decreases in asymmetric MTR, Claro has increased its market share while smaller operators have struggled to gain market shares, challenging the assumption that asymmetric MTR would increase competition levels

Sources: Ovum, GSMA