

# The Impact of the Call Termination Rate Reduction on Consumer Surplus in South Africa

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## **Abstract**

This thematic report presents some initial data on mobile call termination rates, and the welfare improvement due to call termination rate regulatory interventions, in South Africa for the period 2010 to 2015.

## **Keywords**

mobile, call termination rates, rate reduction, consumer surplus, South Africa

## **Recommended citation**

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## 1. Introduction

The Independent Communications Authority of South Africa (ICASA) reduced call termination rates, the price that operators charge one another to complete calls across networks, by more than 90% between 2009 and 2016. Important questions that arise are: (i) what impact has this call termination rate reduction had on consumers, and (ii) is the regulatory intervention worth maintaining in the future? The impact on retail prices has been dramatic, in line with the impact in other African countries (Stork, 2012; Hawthorne, 2015). While the impact on prices and profits has been assessed, including by Stork (2012), there has been no attempt to measure the consumer surplus effects of the call termination rate reductions in South Africa.<sup>1</sup> This thematic report is an introduction to understanding the consumer surplus effects of the call termination rate reductions and is part of a wider research project on the impact of call termination rate reductions on retail telecommunications service prices in South Africa.

A full analysis of total welfare requires the specification of demand and calibration of a model to simulate the welfare effects from price changes (Harbord & Hoernig, 2015). This would include assessing the impact of the termination rate reductions on producer surplus, in addition to consumer surplus. The analysis presented here, while partial, is a first step towards assessing the welfare impact of call termination rate reductions.

## 2. Brief note on literature and recent research on MTRs in selected African countries

Bohlin and Kongaut (2012) provide a useful summary of the empirical research into the impact of mobile call termination rates on retail prices and access to services, largely in developed countries. The results of these studies are contradictory. For example, Genakos and Valletti (2011) found that call termination rate reductions increased retail prices as a result of a “waterbed effect”. The same authors, more recently, found that this waterbed effect had disappeared over time (Genakos & Valletti, 2015). Bohlin and Kongaut (2012) found that call termination rate reductions led to decreases in retail prices, while Pensendorfer and Veronese (2009) found no relationship between mobile termination rate (MTR) reductions and retail prices.

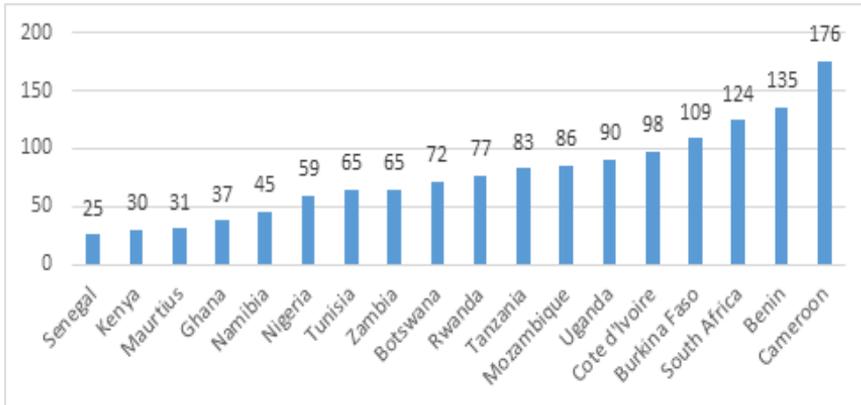
South Africa’s mobile call termination rate in 2010 was comparatively high, against rates in Senegal, Mauritius, Ghana and Kenya, see Figure 1 below. Stork’s (2012) review of the impact of MTR regulatory interventions in Botswana, Kenya, Namibia and South Africa relies on individual case studies, rather than cross-country econometric techniques, to assess the impact of lower call termination rates. As is the case in EU countries, call termination rates diverge significantly across countries in Africa, from as low as ZAR0.25 in Senegal to ZAR1.76 in Cameroon (Stork, 2012). It

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1 Consumer surplus is the difference between willingness to pay and retail prices paid by consumers (Motta, 2004).

is noted that South Africa's call termination rate has been significantly reduced since 2010, from ZAR0.89 (peak) to ZAR0.40 for MTN and Vodacom, and to ZAR0.44 for other mobile operators (ICASA, 2010a).

**Figure 1: Mobile call termination rates in selected African countries (USD cents, at ZAR11 / 1 USD, 2010)**



**Source:** Adapted from Stork (2012)

Where mobile call termination rates have been reduced through regulatory interventions in Botswana, Kenya, Namibia and Nigeria, Stork (2012) finds that retail prices declined, and in many instances the subscriber base and incumbent profitability increased (see Table 1 below). In Botswana, the regulator reduced call termination rates by 15% between 2010 and 2011 and Mascom reduced its prices (OECD high usage basket) by 5% (Stork, 2012). Kenya had the largest regulated decrease in call termination rates and saw the largest decrease in retail prices as a result of the Kenya Communications Commission's (KCC's) intervention. Call termination rates dropped by 84% between 2007 and 2013, by 65% between 2007 and 2010 alone (KCC, 2007; 2010). Between January 2010 and January 2011, Safaricom's (Kenya) retail prices dropped by 68% and its subscriber base grew by 59% (Stork, 2012). Safaricom's earnings before interest, tax, depreciation and amortisation (EBITDA) margin, a measure of profitability, declined from 51.7% to 43.6% (Stork, 2012), but the latter is still significantly above the EBITDA margins earned by mobile operators in South Africa, as discussed below.

The Namibian Communications Commission (RIA, 2009; Stork, 2012) reduced mobile termination rates from NAD1.02 to NAD0.60 in 2009, then, following a glide path, to NAD0.30 in January 2011. The final rate applied to both fixed and mobile networks, as was the case in Nigeria (Stork, 2012). MTRs declined by 51%

from June 2009 to January 2010 (RIA, 2009). Between 2008 and 2010, the largest mobile operator, MTC, increased its subscriber base from 1m to 1.5m subscribers, and its EBITDA margin increased from 50.9% to 55.8% (Stork, 2012). Between 2008 and 2011, MTC's retail prices declined by between 37% and 58% (using the OECD low usage and medium usage baskets respectively) (Stork, 2012). The MTR in Nigeria was regulated by the Nigerian Communications Commission in 2009 (NCC, 2009) and was reduced by 28% (Stork, 2012). MTN, the largest operator in Nigeria reduced its prices between 2008 and 2011 by 37% (using the OECD high usage basket), while the total number of CDMA and GSM subscribers in Nigeria increased by 16% between 2009 and 2010 (Stork, 2012).

MTN in South Africa did not immediately reduce its retail prices. Nevertheless (in terms of the OECD high usage basket, using average prices), MTN's prices eventually declined, while MTN's subscriber base increased by 14% over the period December 2009 to December 2010 (Stork, 2012). Average retail mobile prices, including Vodacom's prices, in South Africa declined significantly after the mobile call termination rate intervention. This is discussed in more detail below.

**Table 1: Mobile call termination rate reductions, price reductions subscriber base increases and incumbent profitability in Botswana, Kenya, Namibia, Nigeria and South Africa**

Country (name of incumbent)	MTR reduction	Retail price change	Subscriber base change	Profitability
Botswana (Mascom)	2010-2014: 60% 2010-2011: 15%	Feb '10-Mar '11 Mascom (OECD high usage basket): -5%	No information in Stork (2012)	No information in Stork (2012)
Kenya (Safaricom)	2007-2013: 84% 2007-2010: 65%	Jan '10-Jan '11: Airtel: -81% Safaricom: -68% Orange: -54%	2007-2010 Safaricom: +59%	2007-2010 Safaricom's EBITDA margin declined from 51.7% to 43.6%
Namibia (MTC)	2009-2011: 72% 2009-2010: 51%	2008-2011 MTC cheapest product: -37% (OECD low usage) -58% (OECD medium usage) -46% (OECD high usage)	2008-2010 MTC increased its subscriber base from 1 million to 1.5 million	2008-2010 MTC's EBITDA margin increased from 50.9% to 55.8%
Nigeria (MTN)	28% for incumbents (NCC, 2009)	2010-2011 MTN (OECD high usage basket): -40%	2009-2010: +16%	No information in Stork (2012)

Country (name of incumbent)	MTR reduction	Retail price change	Subscriber base change	Profitability
South Africa (MTN)	2011-2013: 52%* 2009-Oct 2010: 22%*	2010-2011 MTN (OECD high usage basket): no impact, discussed below.	Dec '09-Dec '10: +14%	No information in Stork (2012)

Source: Adapted from Stork (2012)

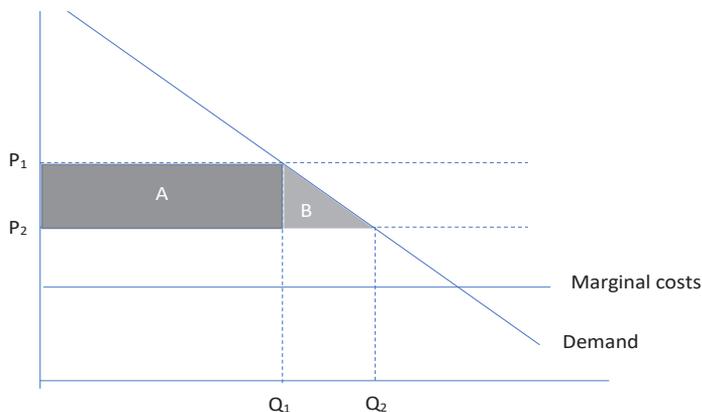
\*Note: Calculated using a simple average of peak and off-peak call termination rates

An important feature of the Stork (2012) study is that, while the impact of MTR reductions on prices and profits have been evaluated, little has been done to calculate the overall magnitude of benefits to consumers, weighed against reduced firm profits.

### 3. Methodology

A standard linear demand model is used to estimate the consumer gains from mobile termination rate reductions following, Greenstein and McDevitt (2010). In order to employ this approach, we assume that all of the price reductions and volume growth over a period of time were attributable to the call termination rate reduction (this assumption is discussed in more detail below). We would need an estimate of the voice price reduction in each year ( $P_1$  and  $P_2$  on Figure 2 below) and growth in the volume of minutes consumed between one year ( $Q_1$ ) and the next year ( $Q_2$ ). We could then calculate the transfer from producers to consumers, Area “A” on the figure below, as follows:  $(P_1 - P_2) * Q_1$ . If we further assume that demand is linear, we are able to calculate the additional consumer surplus resulting from the reduction in deadweight loss to consumers, Area “B” on the figure, as follows:  $(P_1 - P_2) * (Q_2 - Q_1) / 2$ . Area “A” plus Area “B” equals the total improvement in consumer surplus arising from lower prices and greater volumes.

Figure 2: Calculation of welfare benefits from price reductions



#### 4. Results and brief analytical comments

We collated  $Q_1$  and  $Q_2$  from Vodacom and MTN's annual reports for 2009 to 2014, and from their interim results for 2015 (multiplied by 2 in order for an annual estimate).<sup>2</sup> For  $P_1$  and  $P_2$ , we calculate blended prices from outgoing revenues, divided by volumes of outgoing minutes, using the same sources. Vodacom reports outgoing minutes and outgoing voice revenue, from which a price can be directly calculated. MTN reports monthly minutes of use per subscriber (MOU), and numbers of subscribers, and outgoing voice revenue. Total outgoing voice minutes of use can be calculated from the volume of MOU multiplied by the number of subscribers, multiplied by 12. Using this approach, it is estimated that consumers have benefited from price reductions and increased voice usage to the value of approximately R47 billion over the six years 2010 to 2015 (see calculations in Table 2 below).

**Table 2: Welfare improvement due to call termination rate intervention**

	2010	2011	2012	2013	2014	2015*
<b>Vodacom</b>						
Price differential (ZAR) ( $P_2 - P_1$ )	0.17	0.17	0.09	0.21	0.15	0.09
Volume of minutes (m), previous year ( $Q_1$ )	18,792	22,160	26,340	28,349	34,300	38,500
Consumer savings (ZARbn) - Area A ( $(P_2 - P_1) \times (Q_1)$ )	3.18	3.85	2.31	5.90	5.10	3.55
Additional minutes (m), current year ( $Q_2 - Q_1$ )	3,368	4,180	2,009	5,951	4,200	2,500
Consumer savings (ZARbn) - Area B ( $(P_2 - P_1) \times (Q_2 - Q_1) / 2$ )	0.29	0.36	0.09	0.62	0.31	0.12
<b>MTN</b>						
Price differential (ZAR) ( $P_2 - P_1$ )**	0.25	0.10	0.11	0.15	0.31	0.07
Volume of minutes (m), previous year ( $Q_1$ )**	12,339	16,053	18,243	21,354	21,896	32,584
Consumer savings (ZARbn) - Area A ( $(P_2 - P_1) \times (Q_1)$ )	3.05	1.60	2.08	3.13	6.80	2.29
Additional minutes (m), current year ( $Q_2 - Q_1$ )**	3,714	2,190	3,110	543	10,687	4,015
Consumer savings (ZARbn) - Area B ( $(P_2 - P_1) \times (Q_2 - Q_1) / 2$ )	0.46	0.11	0.18	0.04	1.66	0.14

2 We note that MTN may have changed its definition of outgoing minutes, or number of subscribers, or both, in that the MOU increased dramatically from 71 in 2013 to 97 in 2014, after being stable at between 69 and 71 between 2010 and 2013.

	2010	2011	2012	2013	2014	2015*
<b>Annual consumer savings (ZAR billion)</b>	<b>6.98</b>	<b>5.93</b>	<b>4.65</b>	<b>9.69</b>	<b>13.87</b>	<b>6.10</b>
<b>Total consumer savings (ZAR billion)</b>						<b>47.2</b>

**Source:** Analysis based on MTN and Vodacom annual reports 2010-2014 and interim results 2015

**Notes:**

\* 2015 data is estimated from Vodacom's interim results (as at September 2015) and MTN's interim results as at June 2015. Total minutes were annualised by multiplying interim results by 2.

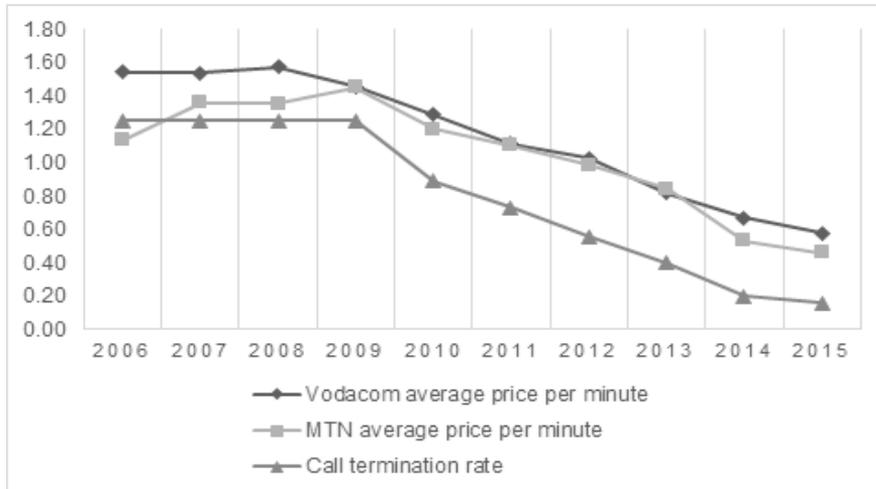
\*\* Volume of outgoing MTN minutes calculated by multiplying minutes of use per month by number of reported subscribers, by 12.

The gains to consumers fluctuated between approximately ZAR4 billion and ZAR14 billion per annum over the period 2010 to 2015. This variation in gains to consumers is significant and suggests that other factors affected pricing over the period, such as special pricing offers by MTN and Vodacom in response to smaller rivals Telkom Mobile and Cell C. It may be the case that not all the price reductions and volume growth are attributable to call termination rate reductions. Some of the increase in volume growth may be attributable to economic growth, or to increased mobile penetration over time. Prices may have declined somewhat, even absent the call termination rate intervention, due to increased economies of scale. Furthermore, Telkom Mobile entered the market in 2010 and may have played an important role in reducing prices, even absent the call termination rate intervention.

Nonetheless, it appears that prices were fairly stable prior to the call termination rate intervention in 2010, if not in fact increasing over time, which suggests that prices were not declining prior this regulatory intervention (see Figure 3). In addition, it isn't clear that Telkom would have been able to effectively compete, absent the call termination rate reductions. Economic growth was low and per capita income growth was very low in South Africa, which suggests that an increase in overall consumption demand per person is unlikely for the period under review (SARB, 2009-2015). While mobile penetration did increase over the period, this is unlikely to have accounted for the dramatic growth in volumes, for example from 19 billion minutes in 2010 to 39 billion minutes in 2015 on the Vodacom network.

Finally, note that the estimate of consumer benefits of ZAR47 billion, is almost certainly biased downwards, since we exclude from the calculations Cell C, Telkom Mobile and fixed to mobile calls from the fixed line operators in South Africa (including Telkom), all of which experienced lower retail prices and many of which experienced considerable growth in voice usage volumes (Hawthorne, 2015).

**Figure 3: MTN, Vodacom blended retail voice prices and peak call termination rates, 2006-2015**



**Source:** See sources and notes for preceding Tables and Figures.

## 5. Conclusion

This brief review of data suggests that consumers have benefited significantly from the call termination rate reductions. A partial analysis, of only MTN and Vodacom's retail prices and volumes, suggests that consumer surplus increased by ZAR47 billion between 2010 and 2015. Including Cell C and Telkom Mobile in the analysis would mean that consumers have benefited significantly more.

Further work is required to assess the total welfare effects of the call termination rate reductions, including the impact on producer surplus and estimating the impact of the regulatory intervention on competition. It is also likely that the rate reduction benefited individual consumer groups in different ways, in other words, while pre-paid consumers likely experienced significant price reductions, post-paid consumers may not have.

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