Regulatory Impact Assessment on National Roaming

Stakeholder Workshop

BOCRA

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Session 2

- Introduction to National Roaming
- The Botswana market context
- Demand survey
- Alternatives to National Roaming for Nteletsa areas

National Roaming

- The ability for a customer of one domestic network (the home network) to access service from another domestic network (the host network) using the same handset.
  - Definition used by Australian Competition & Consumer Commission, 2004
- "Any to any connectivity"
- NR is a type of infrastructure sharing to provide consumers with multiple operator choices

Rationale for NR

	Rationale for NR	Intended benefit	Country
1	Support new entrant	Increased competition resulting in lower prices, increased 3G/4G/LTE coverage and greater service options, lower investment costs, extra source of revenue for incumbents	Turkey, France, New Zealand, EU
2	National coverage in geographically large country	NR would allow consumers to use the same number throughout the country; Greater competition (i.e. less monopoly power)	India, Australia, USA
3	Underserved areas	Lower switch-over cost for consumers (i.e. remove duplicate SIMs); Lower environmental impact (fewer base stations)	France, UAE, Bhutan, Australia
4	Emergency communications	Coverage, traceability of emergency calls in all areas of a country	Australia, USA, UK

Disadvantages of NR

- Disincentive to investment and implementation of infrastructure sharing
- Potential disincentive for new technology investment in rural areas
  - (e.g., 3G)
- May distort competition

Context of NR in Botswana

- History of commercially negotiated national roaming agreements up to year 2000
- Ease of market entry: mature market, new entrant unlikely
- Costs of a SIM are negligible
- Newest operator has the best rural coverage
- Inconvenience of multiple SIMs and of multiple phone numbers
- Potential benefits quantifiable to an extent

Outcomes in other countries

	Country	Outcome
1	Australia	National roaming allowed based on **commercial negotiation** between operators (i.e. no regulatory requirement to provide NR); and Regulatory Authority to **monitor prices and terms and conditions** of NR to ensure that commercial agreements remain fair; Outcome was that **multiple NR agreements were signed** between operators (based on commercial agreement).
2	France	NR required as part of the Programme Zones Blanches (White Zone Program); By 2012, **98.75% of the population** of France was covered by at least three operators, 1.03% by two operators, 0.2% by one operator and 0.02% of the population remain uncovered (a white zone).
3	India	NR offered on a commercial basis between operators; National roaming is an important revenue source for Indian operators, representing **8.57% of total sector revenues**; and 2012 Consultation paper on pricing suggests that the regulator is considering regulatory intervention to reduce prices.

Objective of the study

- To assess whether NR will be viable in Nteletsa II areas, technically, commercially or otherwise taking into account:
  - The viability of roaming in Underserved Areas (USA); and
  - Alternatives that are available for facilitating universal access to ICT in USA such as infrastructure sharing, low cost infrastructure and spectrum allocations.
- Output: Comprehensive Regulatory Impact Assessment (RIA) that shows the costs and benefits of national roaming.

Botswana Market – termination rates

Country	Mobile Termination rate					
	Regulation Currency		US $ FX*	US cents	USD	Ranking
Kenya	1.44	KES	0.01151	1.66	0.01657	1
Tanzania	34.92	Shilling	0.0006	2.1	0.02095	2
Ghana	0.045	New Cedi	0.51259	2.31	0.02307	3
Nigeria	4.9	NGA	0.00624	3.06	0.03058	4
Namibia	0.3	NAD	0.10625	3.19	0.03187	5
Botswana	0.35	Pula	0.11921	4.17	0.04172	6
South Africa	0.4	ZAR	0.10726	4.29	0.04290	7
Cameroon	25.00	XAF	0.00197	4.93	0.04925	8
Mozambique	2.5	MZN	0.03295	8.24	0.08237	9

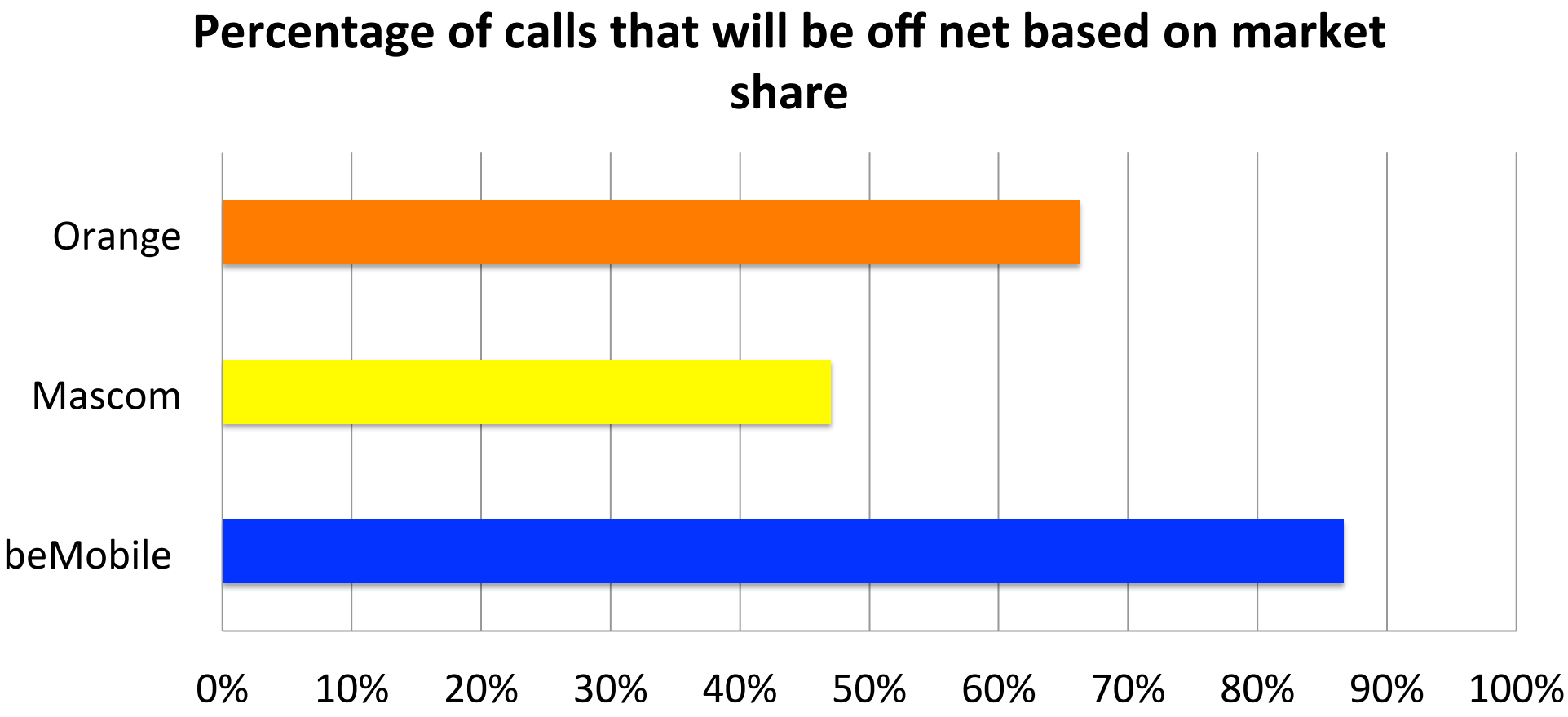
Source: Research ICT Africa

Botswana Market – mobile price basket

Countries	Q4 2010	Q1 2011	Q2 2011	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013
Namibia	12.8	12.8	12.8	12.8	12.2	12.2	12.2	12.2	12.2	12.2
South Africa	16.6	16.6	16.6	14.7	14.7	14.7	12.9	12.9	12.9	12.6
Mozambique	19.5	19.5	17.5	17.5	19.5	16.1	14.0	14.0	14.0	14.0
Botswana	15.8	15.8	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Zambia	16.8	16.8	16.8	16.8	16.8	16.8	16.8	18.6	18.6	18.6

Source: Research ICT Africa, 2013

Botswana Market – off-net calling



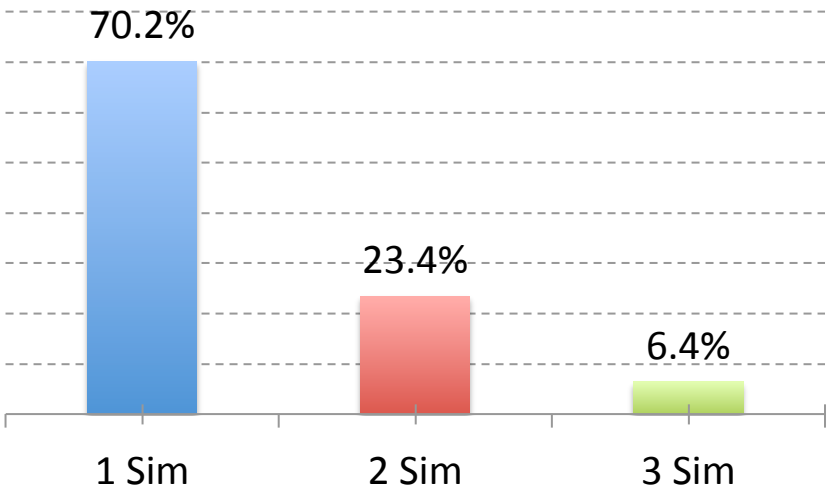
	beMobile	Mascom	Orange
off net	87%	47%	66%

Demand survey

- Small size – indicative not representative
- Carried out for purpose of appreciation of Nteletsa areas and consumer opinion, on a limited budget
- BOCRA customer appreciation study
  - 55% of the population has more than 1 SIM
- Results from Intelecon demand survey
  - 29.8% of villagers in Nteletsa areas have more than 1 SIM
  - 69% of visitors to Nteletsa areas have more than 1 SIM

Demand Survey – multiple SIMs

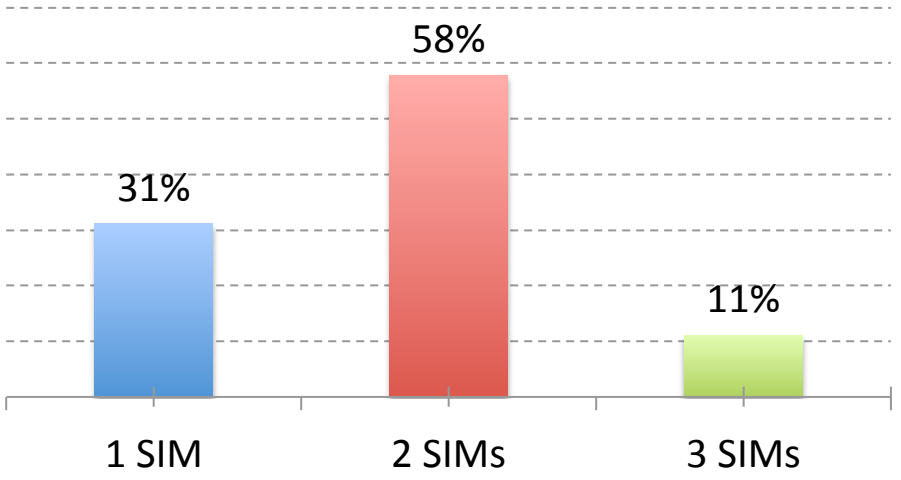
Number of SIMs: Villagers



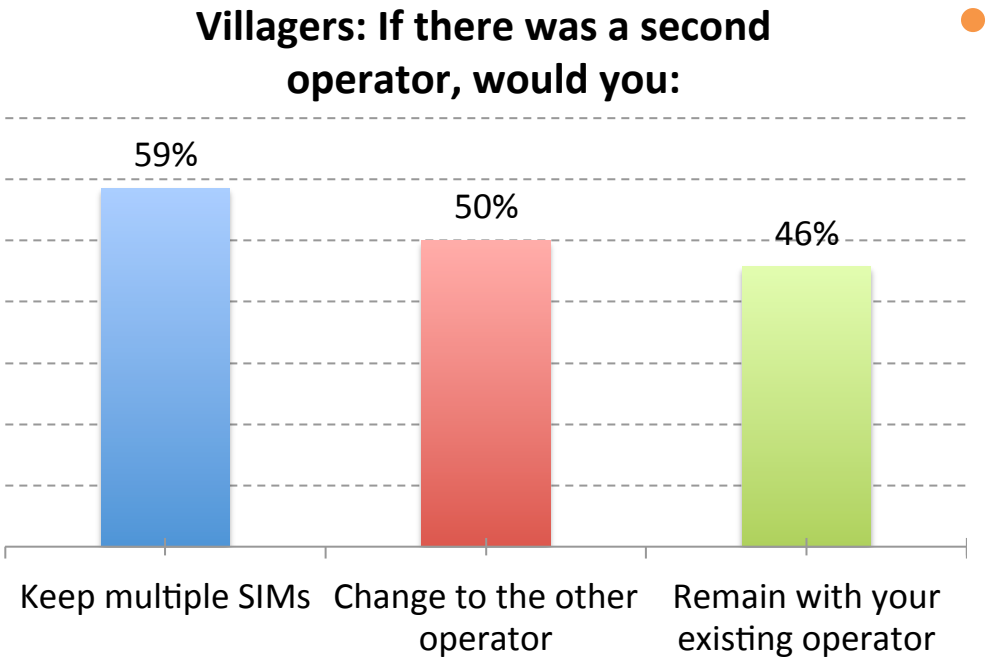
- Villagers
  - 30% own multiple SIMs
  - Only 1 operator therefore multiple SIM ownership < average

- Visitors
  - Higher than national average
  - Visitors *have* to purchase an additional SIM

Number of SIMs: Visitors

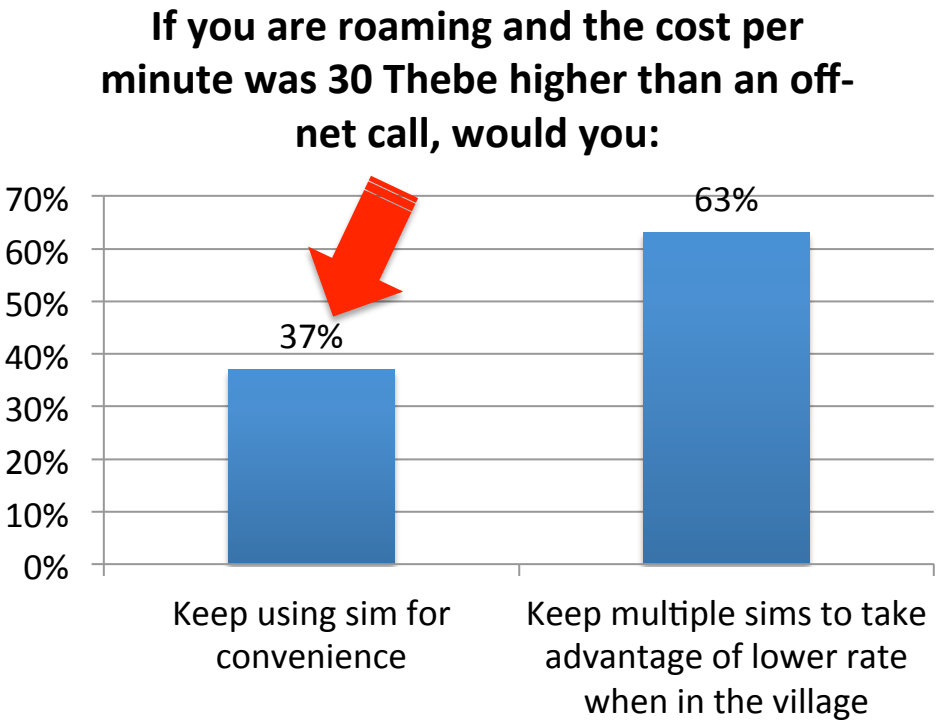


Demand Survey – multiple SIM rationale

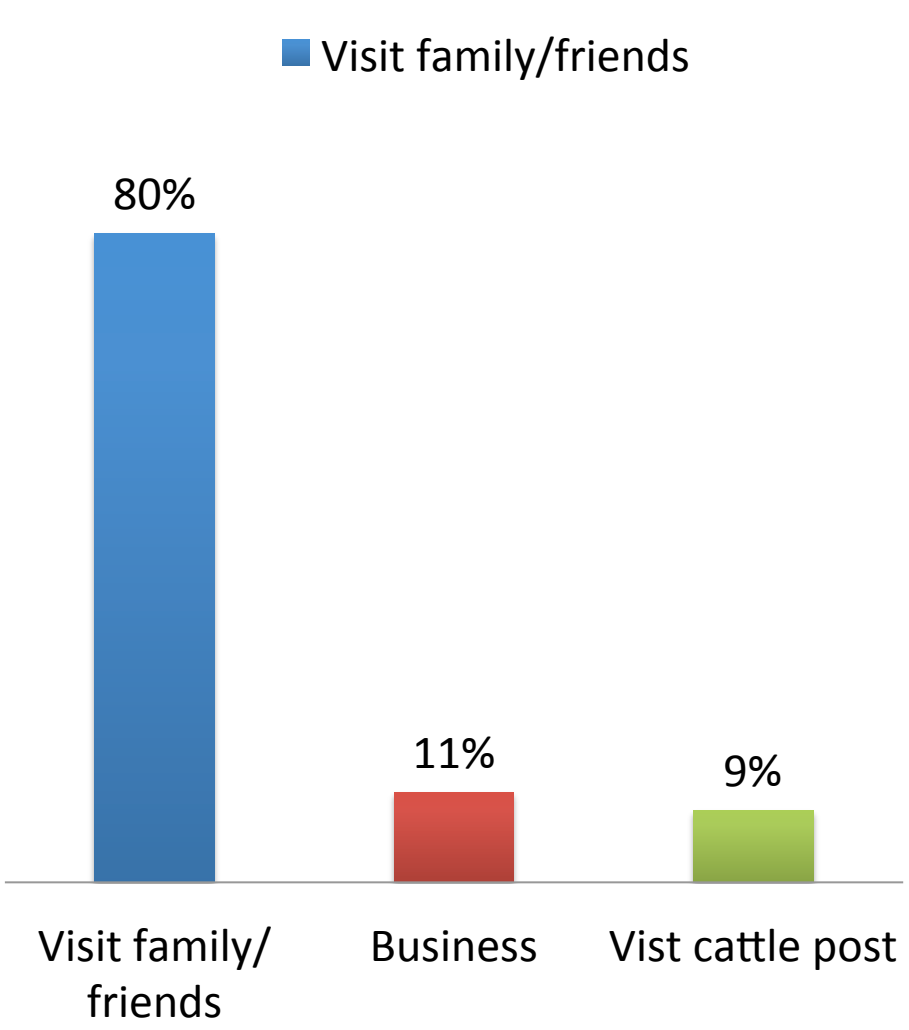


- Villagers
  - 59% keep multiple SIMs
  - Multiple SIM ownership likely to remain prevalent

- Roaming
  - Indication of price elasticity
  - 37% would keep using existing SIM

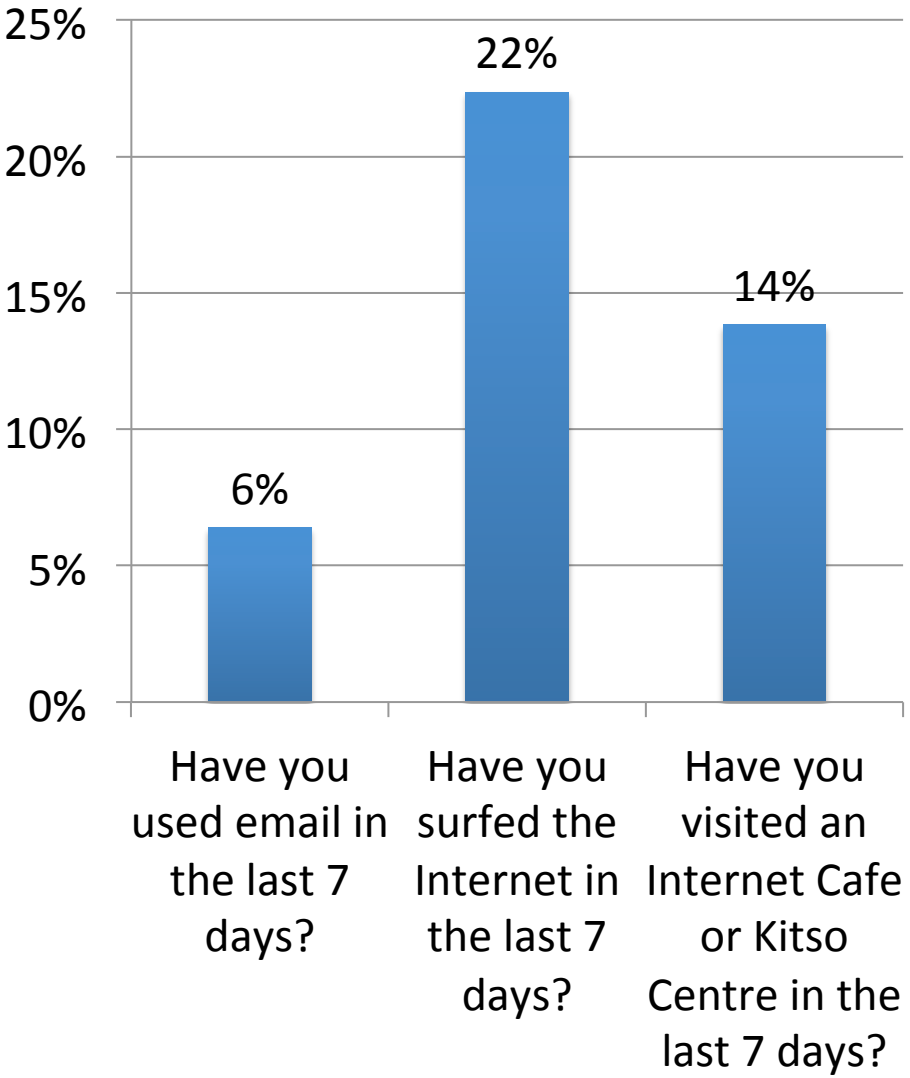


Demand Survey – reason visiting Nteletsa



- Relatively small percentage doing business in Nteletsa areas
- Primary reason to visit family & friends – therefore weekend visits

Demand Survey – data usage



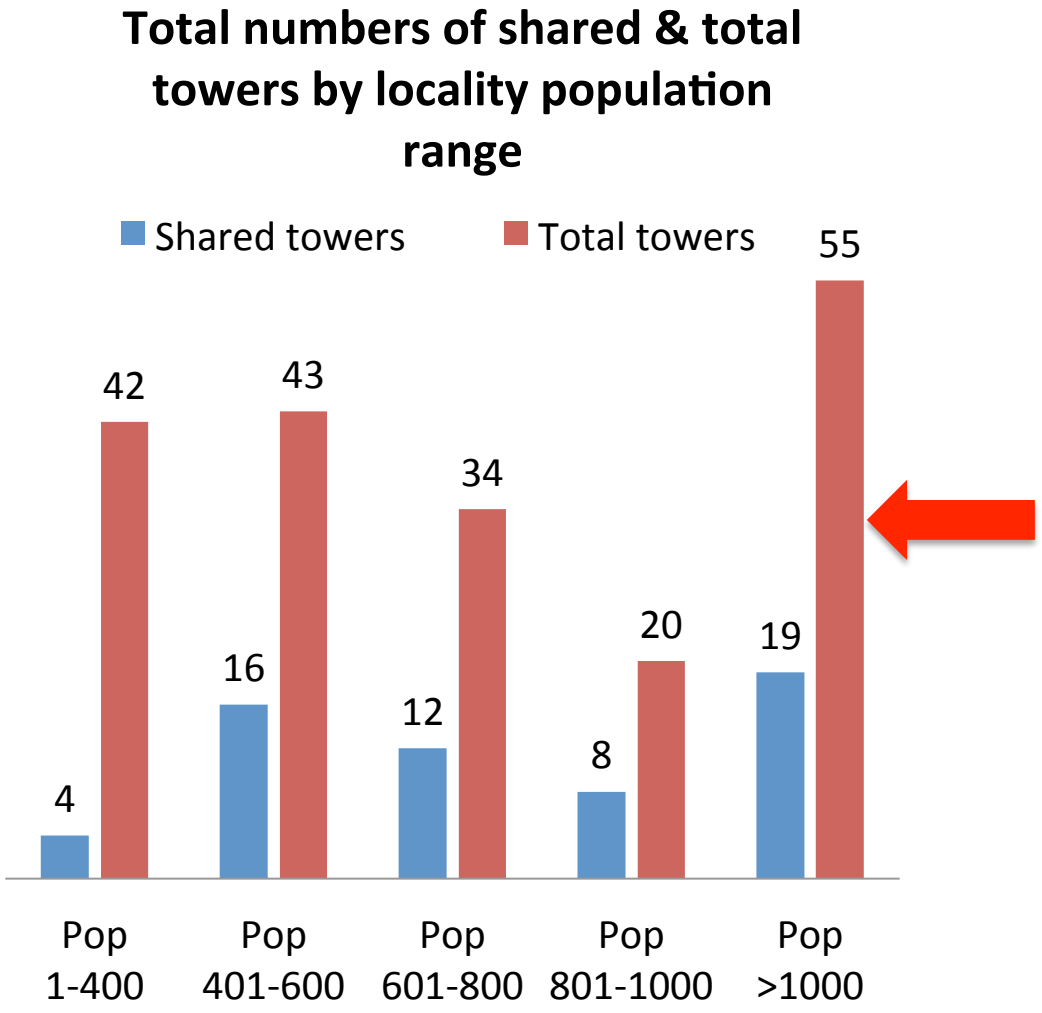
- Villagers
  - Data usage relatively low
- Visitors
  - Smartphones - 11% of visitors have a smartphone.
  - Less than 4% had used the Internet while travelling and none had sent or received email
  - Demand primarily for voice

Alternatives to National Roaming

Alternatives considered

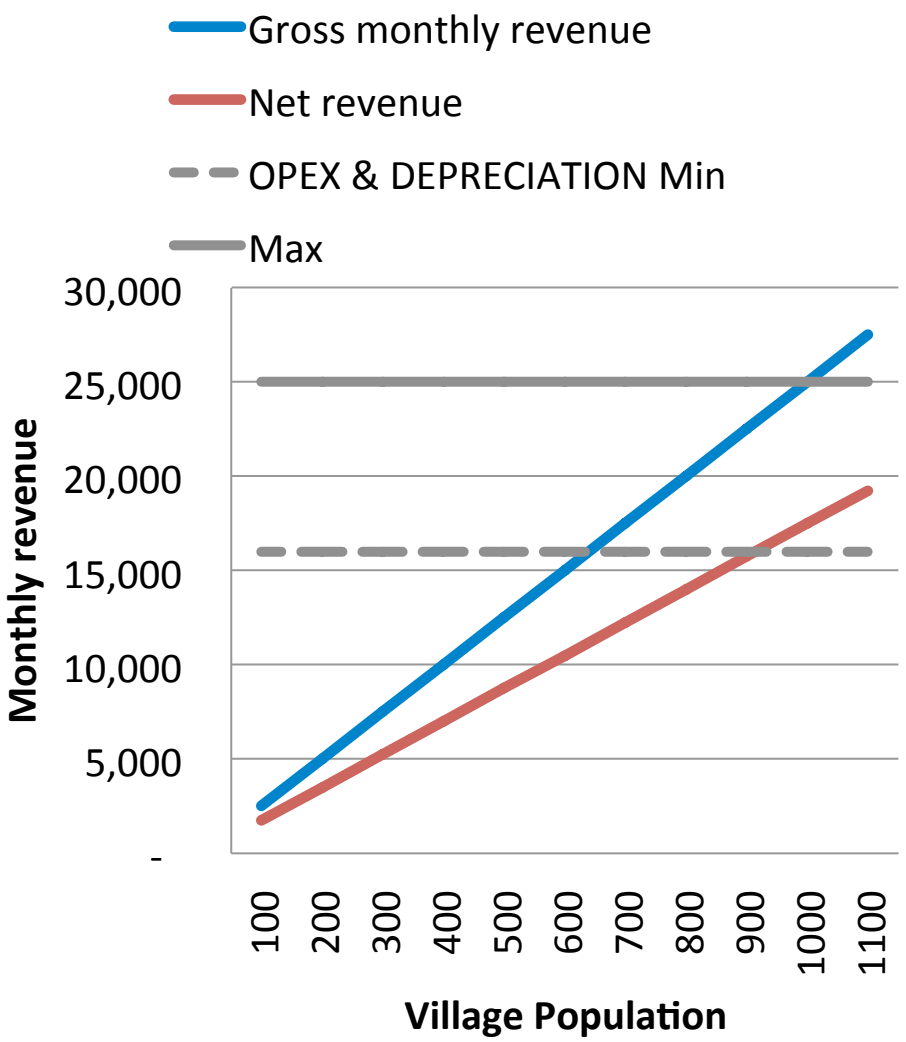
- Infrastructure sharing
  - Already an accepted and encouraged practice
- Encourage new investment in rural areas through
  - Low-cost BTS technologies
  - New pro-rural low frequency assignments to encourage better reach
- Encourage and promote call forwarding
  - Part of the cost/benefit study

Alternatives to NR – infrastructure sharing



- Need for NR in Nteletsa II areas is continuously reducing
- Significant remaining opportunities for second and/or third operator market expansion through infrastructure sharing.

Infrastructure sharing breakeven



- Break-even village population for market entry by means of infrastructure sharing is projected to be in the range 500-1,000.
- Assumptions:
  - ARPU of 66 Pula
  - Market capture = 50%
  - Opex = 16k to 25k
  - Capex recovery = 240k over 5 years

Infrastructure sharing – projected

Size category (pop'n)	Villages	Tower Shared today	Remaining villages	% shared to date	2-3 Year Projected Percentage	New towers shared	Approx. population covered
1-400	42	4	38	9.5%	15%	2	1,422
401-600	43	16	27	37.2%	40%	1	8,626
601-800	34	12	22	35.3%	50%	5	11,892
801-1,000	20	8	12	40.0%	70%	6	12,467
> 1,000	55	19	36	34.5%	90%	31	82,568
Total	**194**	**59**	**135**	**30.4%**		**45**	**116,974**

- Minimum of 45 additional towers are projected to be shared
- Population in villages where towers are projected to be shared by 2016 is almost 117,000 (71%) of the Nteletsa II population

Summary: Infrastructure Sharing

- Minimum 45 additional towers are projected to be shared today
- Nteletsa II population with more than one operator will be 117,000 in 2016
  - 71% of the Nteletsa II population
- Nteletsa II population with only one operator will reduce to 47,000
  - Only 2.3% of Botswana's population

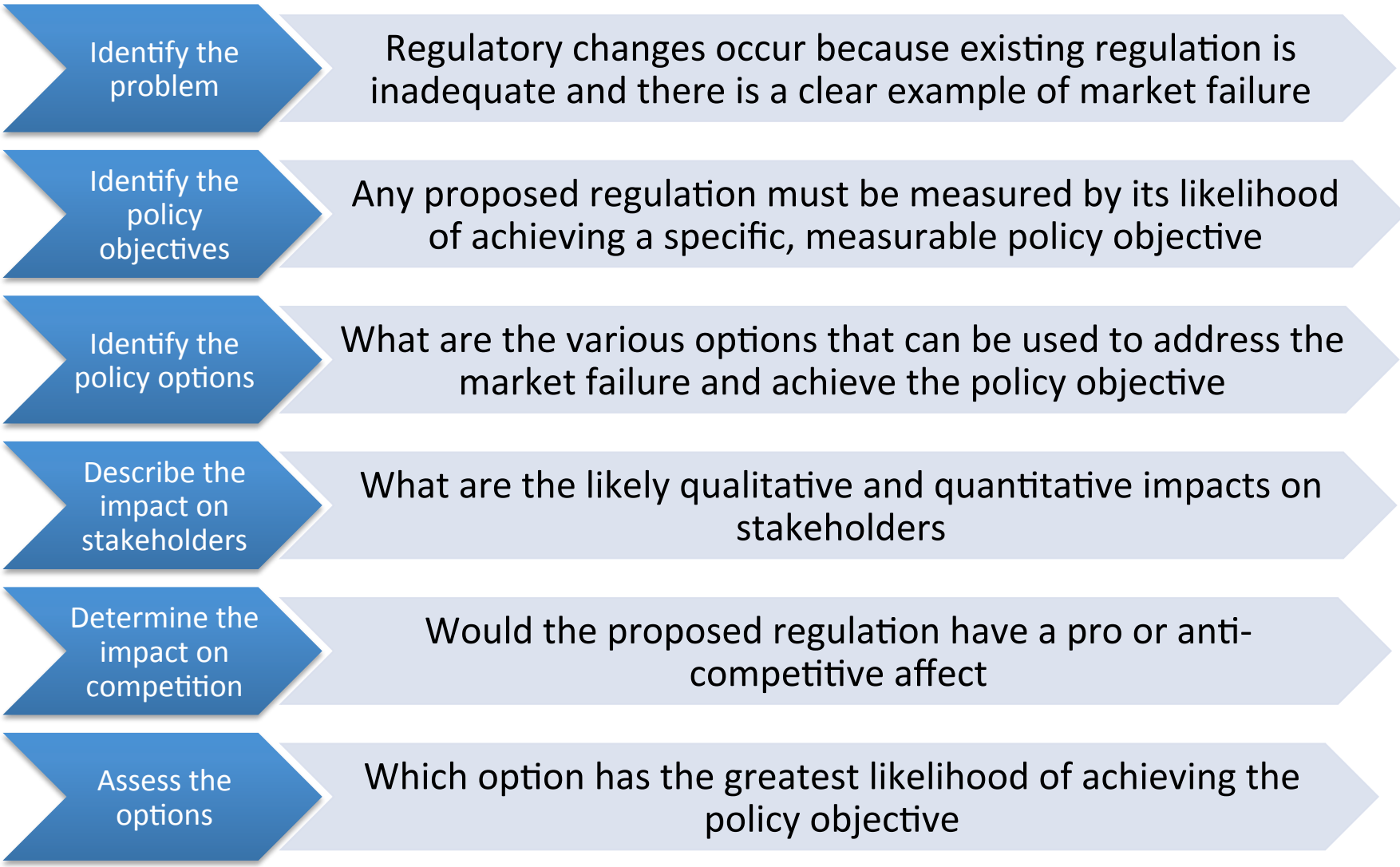
Q&A

- Are there any other countries or models that we have not considered that have particular relevance to Botswana and specifically the concept of NR to achieve UAS?
- Do you agree that other regulatory strategies, such as lowering termination rates, would have a greater impact on pricing in Botswana than mandating NR?
- The demand survey found that the ARPU of both villagers and visitors to Nteletsa areas was higher than the national average. Do you have any data to suggest that this is incorrect?
- The demand survey found that data usage amongst villagers was especially low. Do you have any information that suggests that data usage is higher?
- The analysis of infrastructure sharing found that operators have already had a positive impact on the achievement of any-to-any connectivity and that this is projected to increase. Do you have data to suggest that infrastructure sharing is not going to increase as much as projected over the coming two to three years?

Session 3

- Regulatory Impact Assessment
- Conclusions & Recommendations

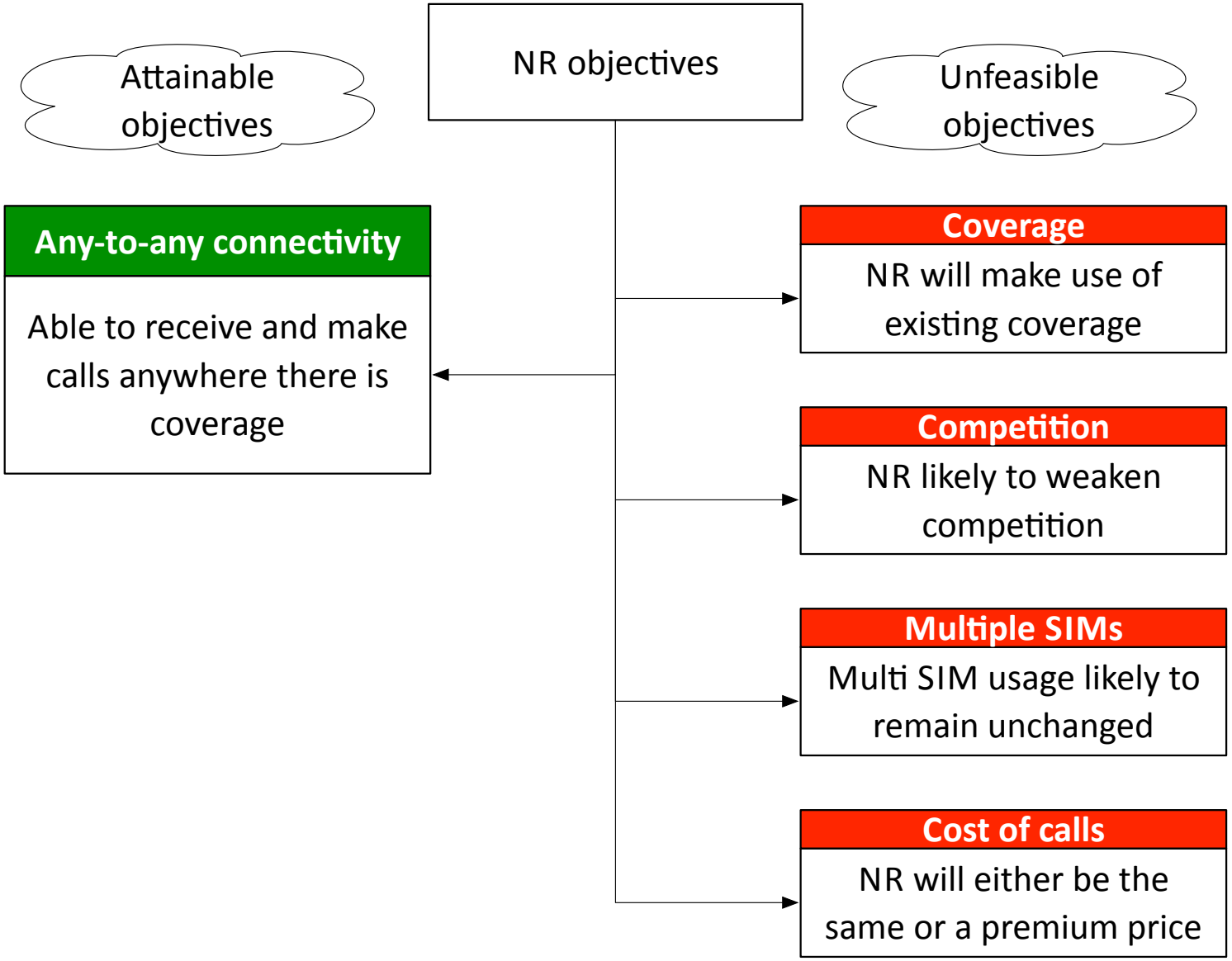
Regulatory Impact Assessment



Problem

- "[T]he underserved areas, which are mainly rural, are covered by a single mobile network and therefore as users move from one area to the other, they are forced to carry multiple SIM cards from various operators" .
- Negative impacts are:
  - **Inconvenience** of having to carry multiple SIMs in order to make a call;
  - **Missing calls** on the original number because contacts are unaware of the new number;
  - **Splitting airtime** between multiple SIMs; and
  - For residents, **no alternative choice of service provider** beyond the single operator providing service – evidence of higher costs reflected in higher ARPU in the Ntelesa II areas

Feasibility of objectives



Regulatory Options

- Option A: Do Nothing
  - No regulatory intervention
- Option B: Promote Other Solutions through Regulation
  - Infrastructure sharing
  - Call forwarding
- Option C: Require National Roaming
  - Mandate NR in order to achieve any-to-any connectivity
- Option D: Encourage commercial negotiation
  - Operators must see NR as mutually beneficial

Impact assessment - assumptions

- Scenario 1: equal price to existing local
- Scenario 2: 15% premium to local rates
- Scenario 3: 30% premium to local rates

Impact - Consumers

No.	Benefits to consumers (travellers)	Value (Pula)	Comment
1	New SIM card	0	Once-off cost
2	Requirement to change numbers	0	Incorporated in cost of call forwarding below
3	Make and receive calls & SMS	6.0	Cost of call forwarding
4	Lost calls	0	Included above in cost of call forwarding
	Total benefit (Pula per month)	6.0	

BENEFIT

	Scenario 1 - No premium	Scenario 2 - 15% premium	Scenario 3 - 30% premium
Number of call minutes	20	20	20
Premium	0%	15%	30%
Difference between standard and premium tariff	0	0.198	0.396
Cost of NR	0	3.96	7.92

COST

COST

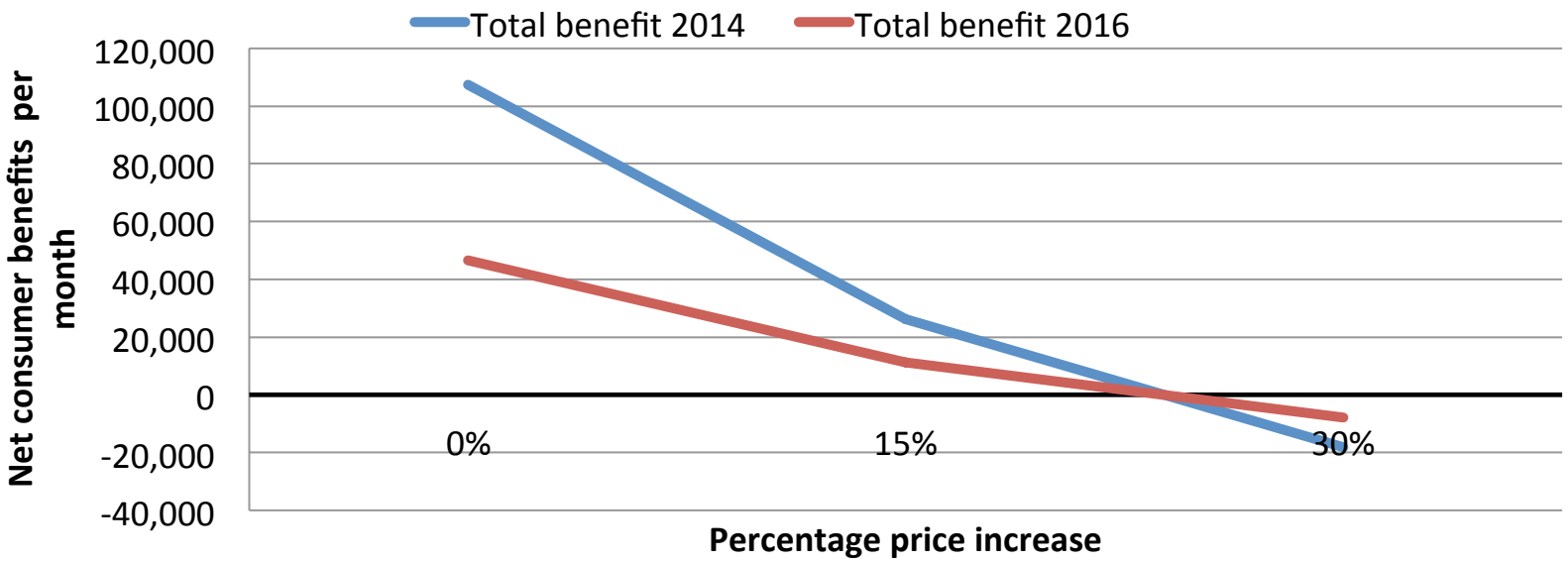
Benefit to cost ratio

	Scenario 1 - No premium	Scenario 2 - 15% premium	Scenario 3 - 30% premium
Benefit	6.0	6.0	6.0
Cost	0	3.96	7.92
Net benefit	6.0	2.04	-1.92
Benefit to cost ratio	n/a	1.52	(0.76)
Max. *visitor* population impacted (2013/14)		25,536	
Total monthly net benefit (2013/14)	101,888	22,216	-17,234
Max. *visitor* population impacted (2016)		11,081	
Total monthly net benefit (2016)	44,214	9,641	-7,479

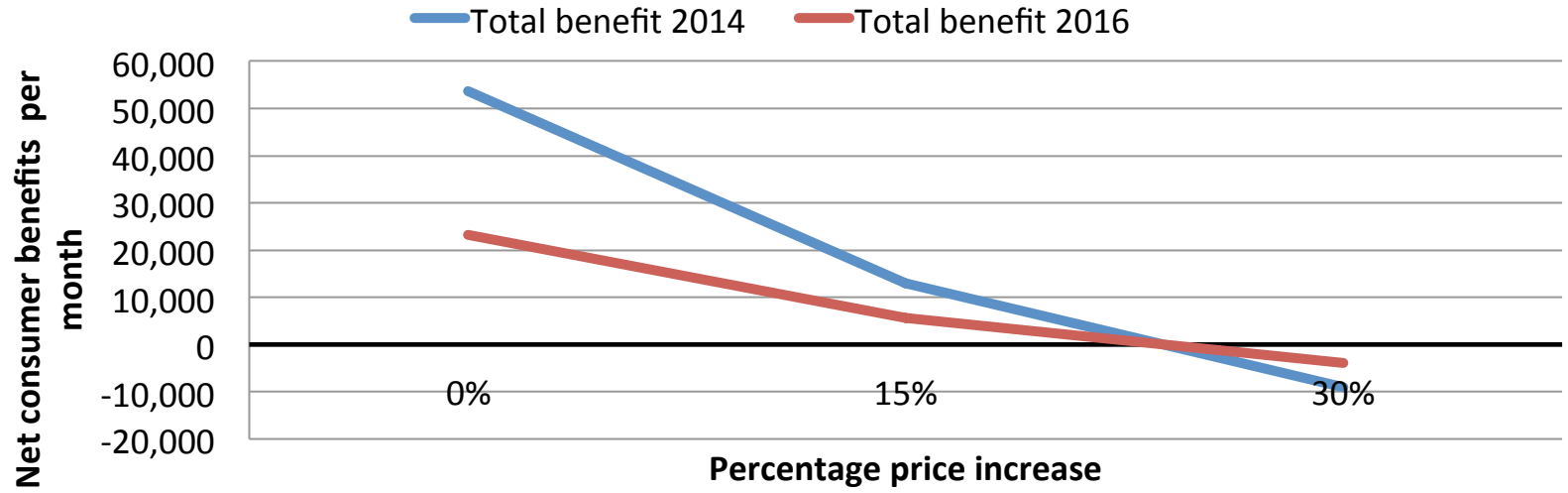
Assumptions	
Villagers in villages with one operator (2013)	109,244
Visitor ratio (from Demand Survey)	23%
Visitor ARPU / Spend in village (20% of month)	120 / 24

Consumer net benefit

Survey ARPU



National ARPU



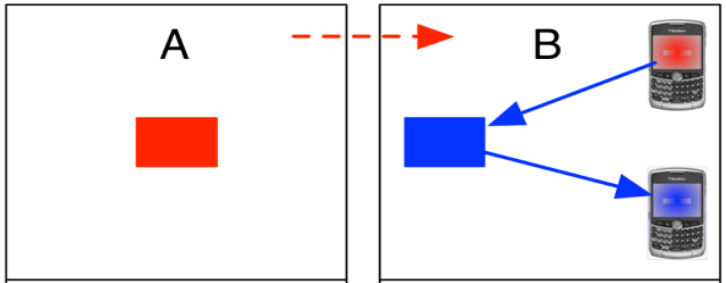
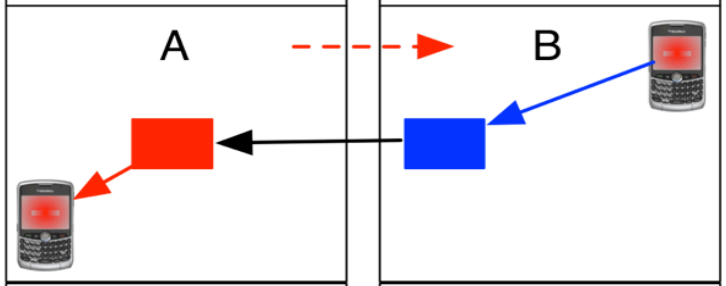
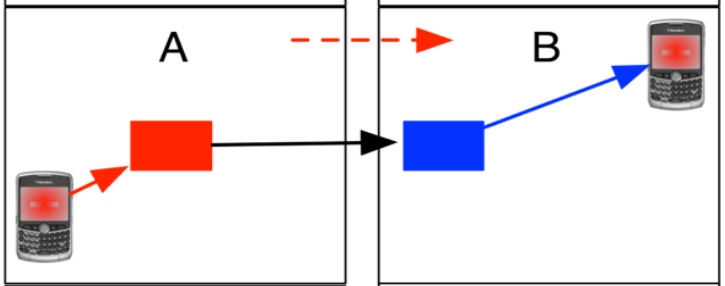
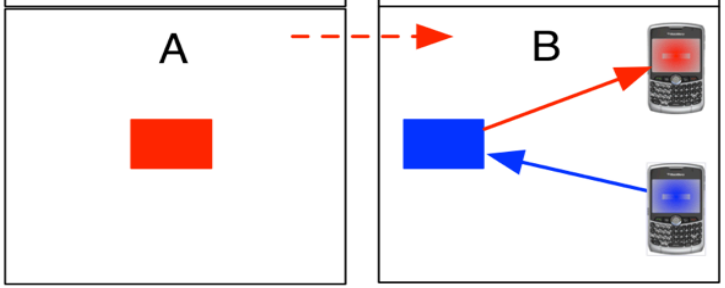
Conclusion – impact on consumers

- Consumers benefit when NR prices equal to existing local call rates or at a 15% premium.
- If NR rates are set at a 30% premium to local call rates, then the net benefit to consumers is negative
  - Consumers will pay out more than the benefit they realize from the convenience of having roaming
- Assuming a lower ARPU: Benefit break-even point is still at the 23% premium over regular tariffs, though benefits are halved

Impact - Operators

- Financial position of each operator considered as roaming host and roamer
- Assumed costs of NR only related to operating administration
  - Exchange of registration records
  - Call details
  - Accounting
- Revenues in each NR pricing scenario
- Longer term - Likely customer market signal / incentive and behaviour

Supply-side assumptions

Call Type	Cost Elements	Illustration
Call inside a visited network Caller from network A goes to network B and makes call to subscriber of network B	Mobile origination in network B **+** National Transit **+** Mobile termination cost + Roaming overhead	
Call from a visited network to home network A visitor from network A goes to network B and makes call back to home network subscriber	Mobile origination in network B + National Transit + Mobile termination cost + Roaming overhead	
Receiving a call in visited network A visitor from network A goes to network B and receives a call from its network	Mobile termination in network B + National Transit cost + Mobile termination cost + Roaming overhead	
Receiving a call inside a visited network A visitor goes from network A to network B and receives a call from network B	Mobile termination in network B + National Transit + Mobile termination cost + Roaming overhead	

Cost assumptions

Cost component	B (Host prices)	A (Roamer operator receipts where appropriate)
Call origination	0.30	0.30
National transit	0.72	0.12
Call termination	0.30	0.30
Normal tariff	1.32	n/a
Roaming overhead cost factor	(Add)	(Add)
Roaming host mark-up of overheads	(Add)	n/a

Variable

Variable

Variable

Scenario	1 (0%)	2 (15%)	3 (30%)
Roaming O/H cost factor	0	0.08	0.10
Host roaming O/H Mark-up	0%	50%	200%
Total price change	**0%**	**15%**	**30%**

Demand-side assumptions

Consumer category	Scenario 1 Same Price	Scenario 2 15% price incr.	Scenario 3 30% price incr.
% Visitors that would make a roaming call	70%	50%	37%
% Visitors that don't make calls that might roam	35.0%	25.0%	18.5%
% Visitors that continue to use beMobile	18.0%	28.0%	34.5%

3 categories of visitors:

1. Relatively price insensitive and would make a roaming call regardless of price;
2. Visitors that might make a roaming call depending on price (i.e., are price sensitive – if price is too high a portion of these would not make any calls);
3. Visitors that would continue with beMobile (i.e. continue to have either multiple SIMs or are already beMobile subscribers).

Sensitivity Analysis

Scenario		Call type 1	Call type 2	Call type 3	Call type 4
		Make a call inside a visited network	Make a call from visited to home network	Receive call in the visited network	Receive call from within visited network
Scenario 1 (0% price increase)	Roaming O/H cost factor	0			
	Host roaming O/H Mark-up	0%			
	Total price change	0%			
Scenario 2 (15% price increase)	Roaming O/H cost factor	0.08			
	Host roaming O/H Mark-up	50%			
	Total price change	15%			
Scenario 3 (30% price increase)	Roaming O/H cost factor	0.10			
	Host roaming O/H Mark-up	200%			
	Total price change	30%			

Baseline Analysis

Baseline scenario	Results
Number of visitors that make calls using multiple SIMs	13,534
Current revenue (assuming no roaming)	324,818
Host network net revenues (assuming BeMobile)	276,391

- The results of the model were compared with a baseline scenario where roaming is not offered – in other words, the situation in Nteletsa areas today

Impact on sector & revenues

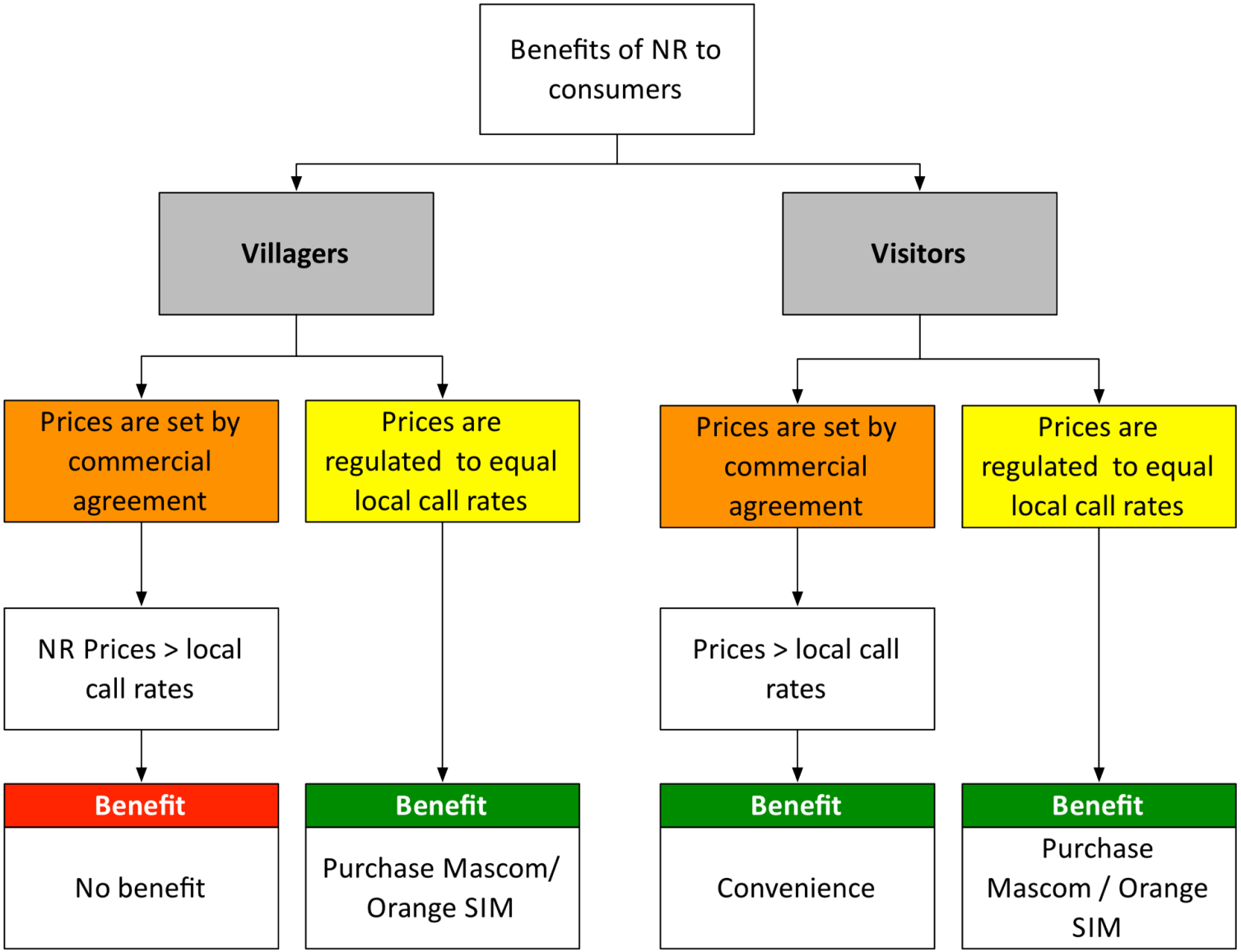
Output summary	Demand assumption	Market revenues	BeMobile revenues
Scenario 1 (0% increase)	70%	66%	+50%
Scenario 2 (15% increase)	50%	47%	+19%
Scenario 3 (30% increase)	37%	35%	-1%

- Results heavily dependent upon demand
- Changing demand assumptions changes outcomes but the balance of outcomes remains the same

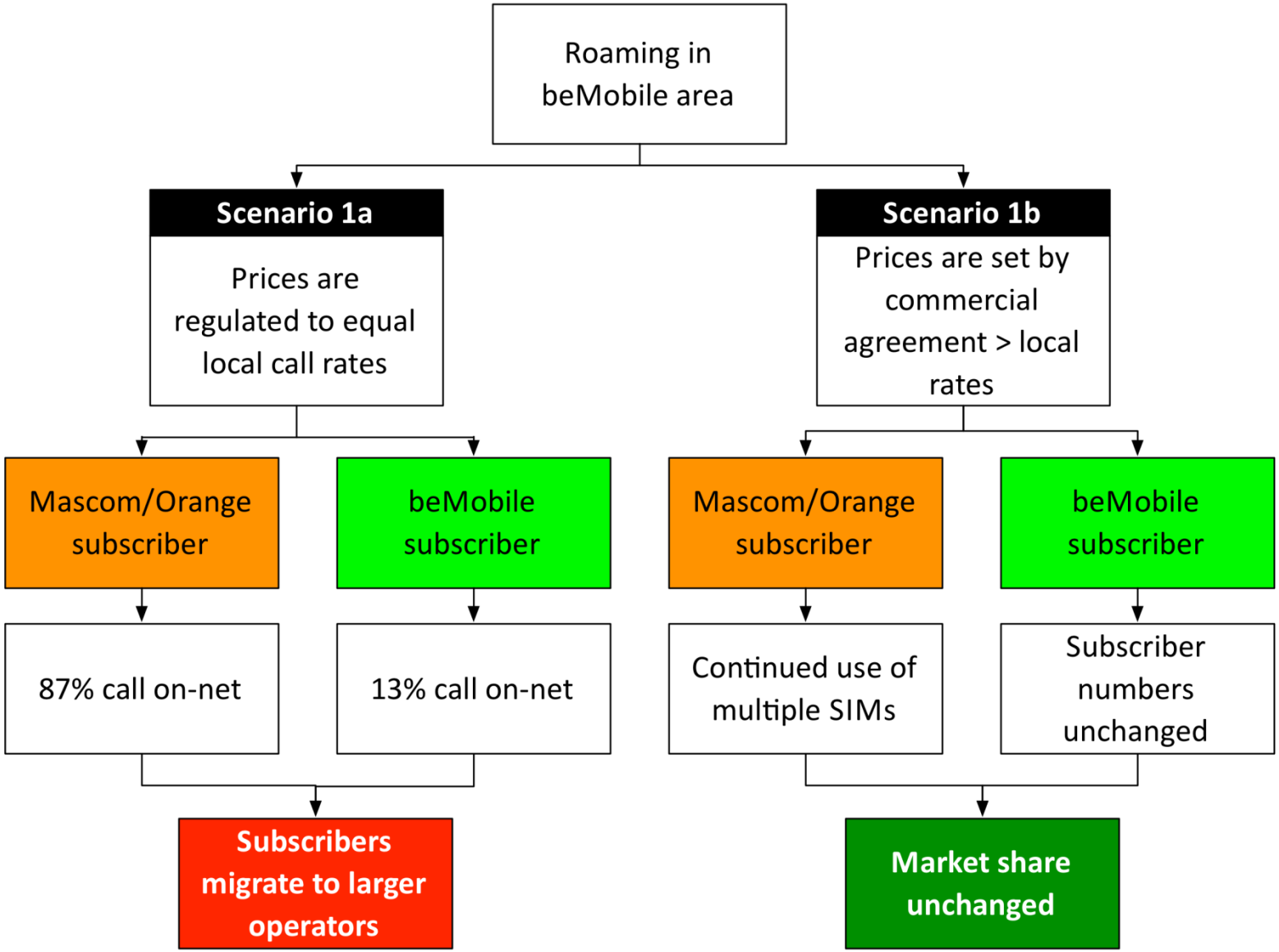
Effect on competition of NR

- The long-term effects on the competitive structure of the market:
  - Necessarily qualitative
  - Derived from the quantitative analysis
- Assumptions
  - In an environment of high termination rates beMobile will struggle to compete against larger operators on price;
  - beMobile and Mascom are the primary operators in Nteletsa areas;
  - beMobile has larger coverage in Nteletsa areas, which is an unusual feature internationally where the newest entrant typically has the smallest coverage.
  - beMobile subscriber base has increased by 89,430 since January 2012 and a *large portion of this is likely from Nteletsa areas*

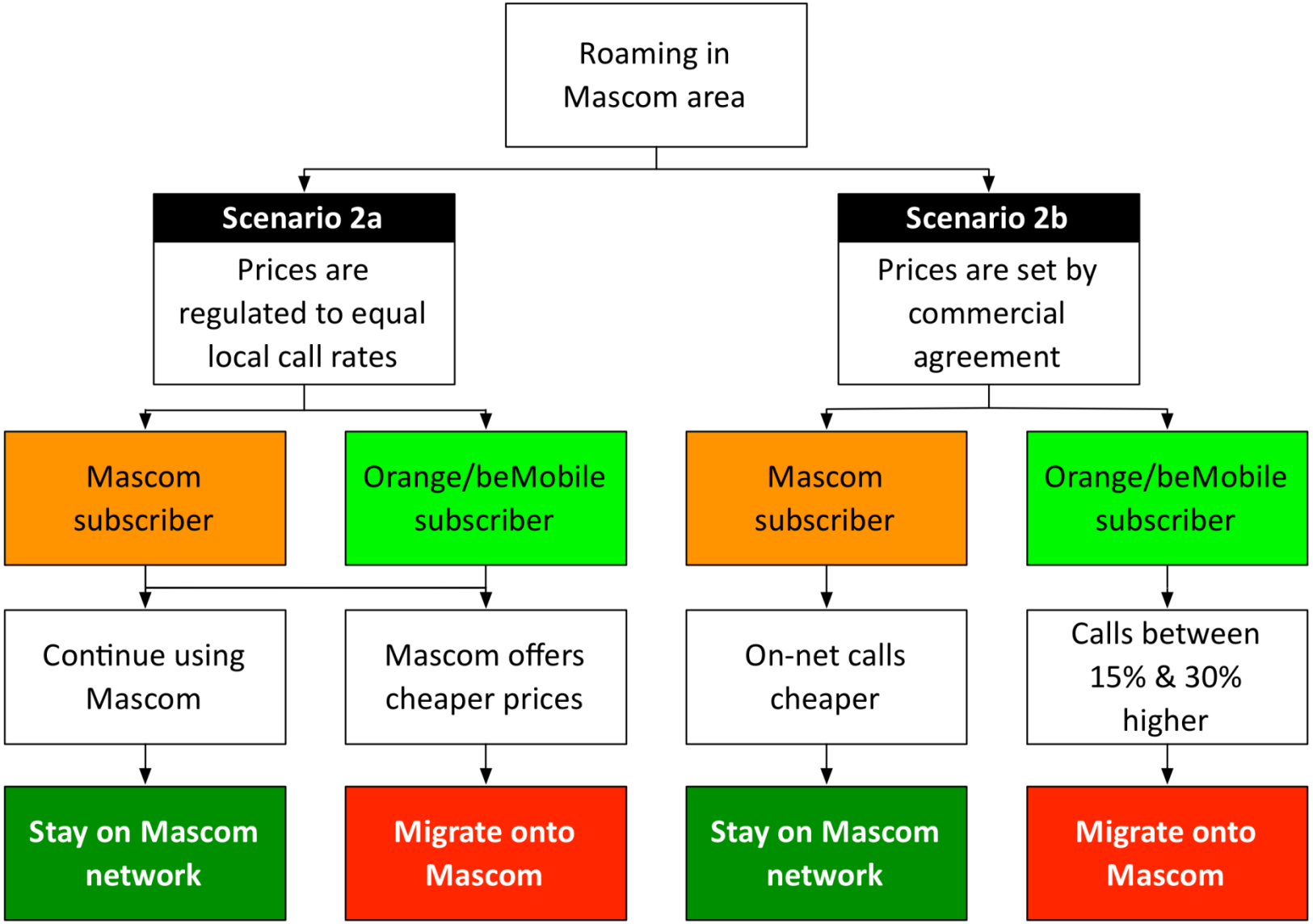
Consumer behaviour



Impact on market share (beMobile Area)



Impact on market share (Mascom area)



Summary

- Scenario 1b and 2b (prices > local rates)
  - beMobile (and Mascom if they wish) charge premium rate
  - Market share between operators will remain roughly unchanged,
  - though in the Mascom Nteletsa area, beMobile customers would be inclined to use a Mascom SIM
- In Scenario 1a and 2a (prices = local rates)
  - Lower prices + identical coverage will attract subscribers onto the larger networks and away from beMobile.

Assess the options

- Alternative regulatory options
  - +/- 47,000 people in the Nteletsa II areas will be served by only one operator - 2.3% of Botswana's population
- Implement NR
  - Revenue increase of 35% to 66%, depending on the tariffs
  - beMobile revenue increase between 50% to a loss of -1%
  - Therefore, NR would increase revenues from Nteletsa areas
- Effect on competition
  - Clear incentive, unless the balance of tariff regimes change significantly, for consumers to move away from beMobile towards either of the larger operators

Conclusions

- Mandating NR would have a marginal benefit but come at a significant competitive cost, with beMobile likely to lose subscribers and the market increasingly dominated by Mascom and Orange
- NR for data - including 3G - is likely to increase customers' incentive for switching to the dominant operator(s) which already have better data coverage and thus increase the pressure on long-term competition in the Botswana telecom market.
  - Should also be studied separately n the context of future broadband policy and potential new entrant options

Recommendations – National Roaming

- Recommendation 1
  - NR is *not* mandated and pricing is *not* regulated. Operators are free to negotiate NR for the Nteletsa areas only, if they find a compelling economic justification. The role of BOCRA is to communicate that there are no regulatory obstacles standing in the way of commercial negotiations between operators;
- Recommendation 2
  - Monitor the terms and conditions of NR commercial agreements that arise to ensure that these agreements are made in good faith; and
- Recommendation 3
  - Provide clear dispute resolution procedures to ensure their speedy resolution.

Recommendations - Regulation

- A faster reduction in termination rates based on an updated benchmark analysis of termination rates in Africa and specifically East Africa;
- Increased retail pricing transparency from operators, particularly dominant operators; and
- An investigation into current pricing regimes (specifically weekly promotions and discounts) and their impact on competition.

Q&A

- The report has stated that the policy objective of NR is any-to-any connectivity. Do you agree? If not, what do you believe the objective of NR in Botswana should be?
- The report has stated that NR would not achieve lower retail tariffs nor reduce the prevalence of SIMs in Botswana. Do you agree? If not, why?
- Four regulatory options have been identified: a) Do nothing; b) Promote other solutions through regulation; c) Require NR; and d) Encourage commercial negotiation.
  - Do you agree that these are the options available to BOCRA? Do you believe that there are other regulatory options that should be considered?
- In terms of benefits to consumers, the report has found that there is a net benefit as long as prices are not increased by more than 23%. Do you agree with the assumptions made to derive this conclusion?

Q & A (2)

- The report has assumed that consumers are relatively price sensitive and that, if NR is implemented and prices are kept at their current level, demand for roaming in Nteletsa areas will be from 70% of visitors and that demand will be lower at premium prices. Do you agree with this premise?
- All operators in Botswana currently offer international prepaid roaming to select countries. The report has assumed that the technical requirement of CAMEL technology in order to implement NR already exists and that the CAPEX to activate NR is relatively insignificant. Consequently, the primary costs of NR are OPEX related and not CAPEX.
  - a) Can you confirm that all operators have CAMEL and that the costs of NR are primarily OPEX related?
  - b) Can you indicate if you agree with the approximate overhead cost assumption at approximately 8 or 10 Thebe per call?
  - c) Do you have any other comment about cost and the wholesale tariff assumption made related to possible commercial NR agreements for the Nteletsa areas?
- Do you have any comments regarding the consultant's analysis of the potential impact on competition, in particular the likely behaviour of customers under various pricing options?

Thank you

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