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1 Executive Summary

1.1 This document sets out an assessment of whether or not there is effective competition in the market for cell site passive infrastructure within Uganda, (CSPI), particularly whether or not one or more of the tower companies and/or the mobile network operators (MNOs) have significant market power (SMP). A firm or group of firms with SMP have the potential to either increase price above and/or reduce output below the competitive level. It follows that consumers will benefit less in a market where CSPs exercise SMP compared with a market in which competition is effective.

1.2 The tower companies Eaton and ATC Uganda supply CSPI to MNOs and are vertically integrated with the downstream wholesale or retail markets. In addition, the MNOs Airtel, MTN, Orange, Smart Telecom and Uganda Telecom self-supply CSPI.

1.3 The number of CSPI sites grew at approximately by 17% on average between 2012 to 2014 Q2. This growth followed entry of the two tower companies, Eaton Towers and ATC Towers. As MNOs are increasingly co-locating on CSPI sites, the growth in the number of CSPI sites is expected to be a lower bound for the increase in MNO cell sites that are hosted on leased CSPI. Furthermore, feedback from MNO during interviews is that the quality of service provided by the tower companies has improved since their entry into the market.

1.4 These observations suggest that MNO geographic coverage is increasing with the increase in the number of CSPI sites and the average number of cell sites per CSPI site. This in turn is expected to improve the quality of service that mobile users receive, in general.

1.5 These observations also consistent with the view that CSPI market is competitive. The two tower companies not only place competitive pressure on each other, but MNOs are also able to place competitive pressure on the market because they are able to build their own CSPI and bypass the tower companies.

Conclusions of SMP assessment

1.6 Our initial view is that the tower companies in the CSPI market currently do not have SMP.

1.7 This conclusion is based on the observed recent growth in the number of CSPI sites; the improving quality of service offered by CSPI operators; and, even though there are only two tower companies, there is little incentive or opportunity to coordinate their actions, particularly given the MNOs ability to build their own CSPI.

2 Introduction

2.1 The purpose of this document is to set out an assessment of whether or not there is effective competition in market for cell site passive infrastructure within Uganda, (CSPI), particularly whether or not one or more of the tower companies and/or the mobile network operators (MNOs) have significant market power (SMP).

2.2 Tower companies and/or MNOs with SMP have the potential to raise the price or limit access to the upstream, wholesale market of CPSI. This implies that customers in downstream, retail markets for mobile services would not derive the same levels of benefits from these markets as they would if there were effective competition. Therefore, it is important to identify whether or not firms have SMP.
2.3 If one or more tower companies and/or MNOs are found to have SMP, then may be appropriate to introduce regulatory measures. Properly designed and implemented, regulatory measures can ameliorate SMP and thus enhance market performance and economic efficiency in the relevant market.

2.4 This assessment commences with a description of the definition of the CSPI market. This is followed by an assessment of the market performance and pricing structure and levels, amongst other factors. Market structure is then examined, which addresses recent developments and the concentration of market shares amongst tower companies and the MNOs. This is followed by an assessment of the conduct of the tower companies in the market, and in turn a description of the basic market conditions. This report concludes with our initial overall conclusions regarding this assessment of SMP in the market for cell site passive infrastructure within Uganda.

3 Relevant Market Definition and Description

3.1 The relevant market for CSPI is defined in the report prepared by Cartesian, for the Uganda Communications Commission (UCC), Review of Uganda Communications Markets: Relevant Markets Report, dated 29th October 2014 (the “Relevant Markets Report”). The Relevant Markets Report identifies that the mobile voice and SMS market as a priority for the SMP assessment.

3.2 The key features of the CSPI market identified in the Relevant Markets Report are:

- The CSPI market is a wholesale market;
- The product is leased space on towers and masts for the purposes of deploying mobile network cell sites;
- The product is delivered using passive infrastructure designed for mobile cell sites, for the avoidance of doubt the market excludes TV and radio masts;
- Mobile CSPs purchase access to CSPI from tower operators, or they build their own CSPI; and
- The geographic scope of the market encompasses the whole of the geographic region of Uganda and does not differentiate between different regions within Uganda.

3.3 The tower companies Eaton and ATC Uganda supply CSPI to MNOs and are vertically integrated with the downstream wholesale or retail markets. In addition, the MNOs Airtel, MTN, Orange, Smart Telecom and Uganda Telecom self-supply CSPI.

Overview of relevant market

3.4 CSPI is a relatively new market in Uganda. Until fairly recently, all MNOs in the Ugandan market accessed CSPI (almost exclusively) through self-supply. This changed in 2012 with the entry of two tower companies: ATC Uganda and Eaton Towers.

3.5 The tower companies purchased cell site infrastructure from a number of MNOs such as MTN and Orange Uganda in sale-and-leaseback transactions. Under the terms of the deals, CSPI assets were transferred to the tower companies with the MNOs becoming tenants on the infrastructure which they used to own. Additionally, tower companies also manage the building (and subsequent management) of new sites for MNOs in a process termed Build-to-Suit (BTS).

3.6 The proceeds of the sale have allowed MNOs to invest in upgrading their network technologies, acquiring customers, growing service usage and increasing service quality.
3.7 Leasing the tower assets to the MNOs provides a predictable income stream for the tower companies. The tower companies make additional revenues through ancillary services such as the provision of power and security.

3.8 Tower companies are able to serve multiple MNOs with the same CSPI. Increasing the tenancy rate of a tower drives tower company profitability, as the majority of costs are fixed.

3.9 Despite the large divestitures, the majority of MNOs still own and operate some CSPI, a portion of which they may share as they wish. According to the latest data, there are 1,933 cell sites being leased in Uganda\(^1\) out of a total of approximately 3400. However, the number of cell sites being leased back may increase as MNOs sell and lease back owned assets in order to capitalise on the asset values and improve cash flow. On the other hand, the total number of sites may fall as tower companies acquire these sites and rationalise their holdings where overlaps exist.

3.10 Of these leased sites, approximately 10% are rooftops and other sites, with the vast majority being classified as greenfield sites, which are towers on open ground. Leased sites carry 2G, 3G, WiMAX, LTE and Microwave radio equipment primarily, owned by wireless communications service providers (CSPs) such as MNOs and fixed wireless service providers (SPs).

4 Market Performance Assessment

*Growth in the Number of Cell Sites*

4.1 Cell site passive infrastructure is a critical input into downstream wholesale and retail mobile services. MNOs require access to CSPI on a long-term, ongoing basis to operate their mobile networks. As such, the current base level of demand for towers is unlikely to diminish over time.

4.2 Incremental demand from MNOs for cell sites depends on two factors: coverage and capacity. To increase coverage, MNOs will require cell sites in areas which are not currently served. Conversely, increasing capacity requires additional cell sites in areas which are already served.

4.3 MNOs can access CSPI via self-supply or leasing. Leased infrastructure may come about via a sale-and-leaseback transaction, or through entering lease agreements for specific towers that the tower company owns.

4.4 The choice of whether to use self-supply or leasing is not an all-or-nothing decision. In some sale-and-leaseback transactions, MNOs chose to retain certain CSPI assets. Furthermore, MNOs may choose to build more towers following the sale-and-leaseback deal.

4.5 MNOs can make the decision to build vs. lease on a site-by-site basis; evaluation criteria will include the relative costs, geographic location, height and time-to-deliver. In cases where an MNO requires a site in an unserved location, it can either build its own tower or ask a tower company to build a new site for them (i.e. build-to-suit).

4.6 The following diagram shows that there has been growth in the number of CSPI sites from 2012, when the tower companies were formed, through to 2014 Q2. The compound annual growth rate (CAGR) is approximately 17% per annum.

\(^1\) MTN and Airtel did not provide data on their respective tower leasing and colocation services
The above graph reports the number of unique CSPI sites. It should be noted, though, that some of these CSPI sites may be single-tenancy, whereas others have two or more MNOs co-locating cell site equipment on them. This implies that the growth in the number of cell sites hosted on CSPI is likely to have been greater than 17% per annum CAGR as the tower companies have indicated that MNOs are co-locating on an increasing number of CSPI.

The CAGR of 17% in CSPI sites since the formation of the tower companies is positive and seems significant when taken at face value. Without data on the growth in CSPI sites and cell sites before 2012 we are unable to draw a definitive conclusion regarding the effect of the formation of the tower companies on the performance of the market. However, we have no reason to conclude that this development in market structure has not been positive and has not led to the development of competition between the tower companies, as they expanded their output to meet demand.

**Service Penetration/Coverage**

As noted above, the number of cell sites has increased and the number sites on which MNOs are co-locating their equipment has also increased. This indicates that the MNOs’ geographic coverage has improved from 2012 to 2014. It is reasonable to believe that mobile users have benefited from this improvement in network coverage as they will be able to make and receive calls, send and receive text messages, and connect to the internet in more locations within Uganda.

**Potential for Market Growth**

The number of towers in Uganda may hold relatively steady in the near term. This is due to build-to-suit deployments being matched by decommissions as suppliers rationalise their asset base to improve profitability.
4.11 Subscriber numbers and capacity demand for downstream retail services will continue to grow, along with demand for newer mobile technologies such as LTE to complement existing ones. This will result in greater demand for new sites (for coverage) and space on existing sites (for capacity and new radio technologies), possibly increasing tenancy rates.

4.12 Coverage increases will likely drive the construction of new towers, while capacity demand (particularly in urban areas with limited ability and appetite to build new towers) will see tenancy rates in those areas rise as MNOs load additional equipment onto existing infrastructure.

**Prices**

4.13 Tower companies submit rate cards to the UCC annually as a part of their licence renewal submissions. However, given that the tower companies were only formed in 2012, this data is limited in its potential for trend analysis.

4.14 Current rates are summarised in the table below.

**Figure 2: Selected CSPI Install and Ongoing Rates**

<table>
<thead>
<tr>
<th>Per Site, USD</th>
<th>Eaton Towers</th>
<th>ATC Uganda</th>
<th>Uganda Towers (Airtel)</th>
</tr>
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<tr>
<td>Installation</td>
<td>1,000 to 6,000</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>Application Fee</td>
<td>N/A</td>
<td>2000</td>
<td>N/A</td>
</tr>
<tr>
<td>Monthly Rate (Grid)</td>
<td>N/A</td>
<td>1,828 to 2,750²</td>
<td>N/A</td>
</tr>
<tr>
<td>Monthly Rate (Non-Grid)</td>
<td>1,475 to 2,700</td>
<td>1,828 to 3,250³</td>
<td>2,347 to 3,029</td>
</tr>
</tbody>
</table>

Source: Stakeholder Data, Cartesian

4.15 Price terms are based on size and weight of the equipment to be mounted on the CSPI (i.e. on the tower/rooftop), ground space, location of the tower and power availability. Non-price terms are related to the duration of contract, which is typically 10 years. Some legacy assets have 15-year terms.

4.16 ATC’s rates vary depending on whether the tower is connected to the electricity grid and whether power costs are passed through or included in the monthly rate. Eaton’s rates vary by type of equipment mounts with WiMAX being the cheapest (USD 1,475) and GSM being the most costly (USD 2,700). For Uganda Towers, the rate varies only by the number of sites leased and not the equipment being mounted.

4.17 Eaton charges per site for installation, ranging from USD 1,000 (WiMAX) to USD 6,000 (GSM). ATC charges an overall application fee of USD 2,000.

4.18 Additionally, tower lease contracts may include price escalation based on a fixed percentage value each year or the Ugandan consumer price index (CPI). Volume discounts may also be offered for customers committing to a certain number of towers leased and/or built by an agreed point in the contract, with the monthly rate for existing towers increased if these targets are not met.

² Upper end of range includes power consumption costs; at lower end of range, consumption costs are passed through
³ Upper end of range includes power consumption costs; at lower end of range, consumption costs are passed through
4.19 Other differences in contracts between customers include: some customers are charged for DC equipment while others are not; application fees are waived for some customers; customers are charged substantially different rates for additional ground space.

4.20 As to whether some MNOs (e.g. the smaller ones) may be disadvantaged by volume discounts and other differences, it’s important to recognise that there are only a few MNOs in the market; as such the business of every one of them is valuable to the tower companies. We note that tower companies have an incentive to maximise the tenancy of their towers and as discussed below – self supply is a possible alternative on a case-by-case basis. These factors provides some constraint on excessive pricing.

4.21 Typically, tower companies charge different rates for leasing space on existing towers versus towers that are “built-to-suit” the customer. The latter is primarily calculated on a tower-by-tower basis and takes into account factors such as location, grid-connection, and likelihood of multi-tenancy.

4.22 The lease rates for existing towers are agreed between the tower companies and MNOs either as a part of the “sale and leaseback” process or as part of a normal tower leasing agreement. A sale-and-leaseback deal may result in lower rates and improved non-price terms for the lease as these terms are part of the negotiations regarding the price of the towers to be purchased by the tower companies. In these deals, a sale price is negotiated along with a lease price. The parties in a negotiation may concede ground on one of these in exchange for gains on the other.

4.23 We are aware, for example, that MTN has negotiated a rate with ATC which is below the market rate (USD 1828 per month, excluding pass-through power costs). Eaton also offers “anchor tenant” rates to Orange on the towers it acquired from them.

4.24 As a non-price example of special terms negotiated in a tower sale-and-leaseback deal, ATC allows MTN Uganda to exceed standard configurations on their towers at no additional charge if they are the only tenant. If another tenant requests some or all of the space, ATC gives MTN the right of first refusal (ROFR) on the space it currently occupies. Given that almost all ATC sites are ex-MTN, it follows then that these terms apply to most of their CSPI assets.

4.25 In terms of the implications for competition of these preferential terms, the agreements need to be considered in the overall terms of the sale-and-leaseback deals. We would not expect the tower companies to accept terms that prevented or hindered them from signing additional tenants as they have a commercial incentive to maximise the tenancy rate on acquired towers. Based on this assessment we do not consider the preferential terms to harm effective competition.

4.26 We conclude that while price is a relevant and applicable criteria for consideration, there appears to be no significant issues on pricing in the market at this time. No issues on pricing were raised by customers during interviews.

4.27 We do however have some concerns regarding transparency of price and non-price terms. These are discussed in the section on Transparency in Section 6, below.

**Tower company revenue and profitability**

4.28 The chart below shows data collected from ATC Uganda and Eaton Towers with regard to their revenues (total and per cell site).
4.29 The chart shows that ATC has steadily grown its quarterly revenues over the last two years, from UGX 14B to UGX 21B. During this time, per site revenues have slowly increased from UGX 14M per quarter to UGX 17M per quarter. We understand that ATC’s low tenancy rates (1.14 per tower) have contributed to this slow growth.

4.30 Eaton’s quarterly revenues grew rapidly at the end of 2012 at which point it overtook ATC. Eaton’s quarterly revenues through 2013 were fairly flat, hovering around UGX 24B, with an uptick in the first half of 2014. Eaton’s revenue per site has climbed faster than ATC’s, potentially indicating an improvement in tenancy rates.4

4.31 Analysing the profitability of the two tower companies was difficult due to the limited information which was provided. For Q2 2014, neither company was profitable at an EBIT level. Eaton’s EBIT was -8%, while ATC EBIT for this quarter was -22%.

4.32 ATC provided details of its EBITDA which was 27% in Q2 2014, and has averaged 23% from Q3 2012 to Q2 2014.5

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4 Eaton did not provide tenancy rate data
5 Eaton did not provide cost data for previous quarters. Additionally, Eaton cost data included depreciation and amortisation costs, meaning EBITDA could not be calculated.
4.33 ATC’s EBITDA is comparable to the EBITDA margins of two major Pan-African tower companies, HIS Africa and Helios, can be seen in Figure 4 below. IHS Africa and Helios Towers have multi-year EBITDA margins of 23% (2 years, 2012 to 2013) and 4.9% (3 years, 2011 to 2013) respectively.

![Figure 4: EBITDA Margins of Selected Pan-African Tower Companies, 2011 – 2014](source: Stakeholder Data, Cartesian)

4.34 These benchmark EBITDAs are low in comparison to the 5-year-average EBITDA margin of international players such as American Tower (59%), Crown Castle (56%), and SBA Communications (57%).

**Service Quality**

4.35 Service quality for tower companies is measured and monitored using service level agreements (SLAs) in individual contracts negotiated with wireless CSPs.

4.36 Stakeholder interviews have revealed some concerns about tower companies’ service quality, which may create a competitive opportunity for operators.

4.37 Irregular service outages are caused by vandalism and/or theft of equipment and fuel at cell sites. They result in a tower being put offline until it can be restored, with some sites being designated as “hardship” and so, subject to lower SLAs.

4.38 There is consensus that service quality has been improving as towers are connected to grid and security and enforcement is improved.

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4.39 Tower companies are able to offer upwards of 95% uptime, with minor differences in levels between rural and urban sites. For example, ATC offers 99.5% uptime in rural areas and 99.8% uptime in urban areas.

4.40 The reported improvements in service quality is an indicator that the tower companies are competing on service quality.

Innovation

4.41 Innovation in this market appears to be focused on improving service quality and reliability, by investing in measures such as connecting CSPIs to electricity grid. As noted, improvements in service is an indicator that there is competition between service companies.

5 Market Structure Assessment

Market Concentration

5.1 Based on stakeholder-submitted data, we can calculate the concentration levels of the CSPI market (using the Herfindahl Index, HHI).

Figure 5: CSPI Provider Market Share, 2012 – 2015 (Forecast)

Source: Stakeholder Data, Cartesian
5.2 The CSPI market concentration (HHI) increased slightly from 2,838 in 2012 to 2,868 in mid-2014. The number of towers themselves increased from 2,647 to 3,399 over the same period. The HHI value (see Figure 7 below) reflects a moderately high level of market concentration (typically greater than 2,500).

5.3 The significant increase in Airtel’s towers in 2013 was due to their acquisition of Warid and their CSPI assets.

5.4 At time of writing (November 2014), Airtel is in the process of selling 575 towers to Eaton, to increase Eaton’s holding to 1,291 towers. At completion of this sale, the market concentration will rise significantly to 3086 (see Figure 7). If Airtel sells its towers to Eaton, then Eaton’s share of the market would increase.

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8 International Finance Corporation, 2014
5.5 The above analysis indicates that the market will become more concentrated, with Eaton and ATC Uganda having the most significant share of the market (57% in Q2 2014, rising as high as 74% after Eaton’s acquisition of Airtel assets).

**Network Effects and Externalities**

5.6 Network effects and externalities are not a feature of this market, and so are not considered here.

**Barriers to entry**

5.7 Tower companies must consider the business cases of each site before committing to build a new site. Existing towers owned by other MNOs or tower companies at a location act as a barrier to entry, as the existing towers reduce the potential of having multiple tenants on the new site. This undermines the profitability of the site.

5.8 Interviews with tower companies have indicated that tower companies will refer potential customer to exiting site owners where they do not have sites if they believe there is no business case to build a new site at that location.

5.9 In areas where a build-to-suit business case can be made, the tower company must overcome site-specific challenges. Firstly, they must secure a commercial lease for the land or rooftop on which they wish to build the site. This requires negotiation with the land or building owner. Urban areas, where space is at a premium, will result in higher costs to procure space for a tower.

5.10 Permission and rights of way must be obtained to build the tower and lay any necessary fixed backhaul to the site. This typically involves local government authorities and the required permissions may take weeks or months to obtain, depending on the location and the local authorities requirements.
Lastly, capital costs of building the tower can be substantial. As discussed in the section on cost conditions, towers can be costly to build. While individual towers can be built with some investment (approximately USD 150,000 per tower), a national network of several hundred towers can cost upwards of USD 100M, which is a very significant sum.

**Sunk Costs**

There are significant fixed and sunk costs in building CSPI. These include the purchase of land and construction of tower structures. Other sunk costs include the training of security, maintenance and installation teams, and the obtaining of necessary building permits and rights of way.

However, tower companies typically lease land rather than purchase it to minimise sunk costs. Thus the main components of sunk costs tend to be tower construction and capacity building for the various teams involved in security, and particularly maintenance and installation, as these are handled by the tower companies and not the lessees.

Fixed costs are significant in the CSPI market. Even though towers can be decommissioned or sold to monetise underutilised assets, increasing utilisation is a key objective for tower companies. This is primarily achieved through increasing the number of tenants on each site.

**Economies of Scale**

In order to offer a competitive national CSPI service to wireless CSPs, an SP must invest in acquiring a large network of sites. This can be costly, as evidenced by the deals involving the tower companies buying the MNOs’ infrastructure.

Due to this large fixed cost, tower companies are incentivised to increase tenancy on each site to maximise the site profitability. This can be done by acquiring more customers or by reducing the number of duplicated or unnecessary sites.

ATC Uganda currently have an average tenancy ratio of 1.14, which is under the typical breakeven average tenancy ratio of 1.5 in developing countries. Other tower companies and MNOs did not provide data on tenancy rates.

Figure 8 below illustrates a situation where two tenants share a single CSPI site. Separate space on the tower as well as the ground is required to house each tenant’s equipment.
Incremental revenue per tenant is far greater than the incremental cost of adding that tenant, and given the significant fixed costs of building or acquiring each site, tower companies require multiple tenants to maximise profitability. This is illustrated in Figure 9 below.
5.20 As can be seen above, tower companies rely on scale benefits to maximise profitability in this market, spreading fixed costs over multiple customers.

5.21 Therefore, there are significant benefits to leveraging economies of scale in this market, even if it is still viable to operate without them. As such, we find this criteria to be relevant and applicable to this SMP analysis.

**Economies of Scope**

5.22 As noted above, tower companies aim to improve the returns from a CSPI site by increasing the number of tenants on that site, as there are economies of scale. One strategy that tower companies have employed to increase the number of tenants is to include different types of tenants. That is, as well as locating more than one MNO on a site, tower companies might also locate say fixed-wireless network operators on a site, thereby taking advantage of any potential for the economies of scope.

**Extent of Vertical Integration**

5.23 Tower companies do not offer any downstream or upstream inputs in the mobile telecom sector. They tend to be highly specialised companies.

5.24 Whilst MNOs are able to self-supply, and hence vertically integrate CSPI into their business, this is of limited interest here as they are not leasing tower space to other CSPs.

5.25 Shared ownership is of greater relevance. In 2011, American Tower Corporation (“American Tower”) and MTN Group Limited (“MTN Group”) announced a new joint venture (“ATC Uganda”) to acquire the tower assets of MTN in Uganda. According to the press release, ATC Uganda is to be managed by American Tower and controlled by a holding company of which American Tower will hold a 51% stake and MTN group holds a 49% stake. MTN’s investment in ATC Uganda is relevant should MTN have
influence over the activities of ATC Uganda. However, we found no evidence that ATC Uganda is acting to foreclose or distort competition in the mobile broadband market.

5.26 Given the potential for competitive issues in the market due to vertical integration, we consider this criteria to be relevant and applicable to this SMP analysis.

6 Market Conduct Assessment

Scale and Ability to Access Resources

6.1 There are several main suppliers in this market: ATC Uganda, Eaton Towers, Uganda Towers (Airtel), Uganda Telecom and Orange Uganda (Africell). Within this group are two venture-backed tower companies, one tower company subsidiary of an MNO and two MNOs.

6.2 ATC Uganda is a joint-venture formed by American Tower (51% shareholding) and MTN Group (parent company of MTN Uganda). ATC Uganda operates only in Uganda, but its parent company American Tower operates globally and in several African markets including Nigeria and South Africa. Global net income for American Tower in 2013 was USD 551 million, demonstrating its ability to invest. It invested USD 89 million for its 51% share in ATC Uganda.

6.3 Eaton Towers is a venture-backed tower company operating in several African markets, including Ghana, Uganda, South Africa, Kenya, Niger and Burkina Faso. They have managed to raise capital in multiple rounds to acquire tower assets across Africa, demonstrating their ability to access significant resources to acquire and grow their operations.

6.4 In September 2011, Eaton received USD 150 million from Capital International Private Equity Funds, a private equity investor that focuses on emerging markets. It used part of these proceeds to acquire the CSPI assets of Orange (approx. 400 towers) and Warid (approx. 300 towers).

6.5 From the perspective of self-supply, it is also interesting to consider the ability of the MNOs to access resources.

6.6 These MNOs, MTN, Airtel and Africell, operating as Orange, have operations in several markets (including significant presence in Africa), generating substantial revenues (Figure 6).

6.7 This gives them significant ability to share resources at the group-level for self-supplying CSPI, particularly in developing countries. For example, funding and site management expertise can be shared across the MNO group.

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**Figure 10: Data and Financials of Multinational CSPs in Uganda, 2013/14**

<table>
<thead>
<tr>
<th>Name</th>
<th>Global Subscriptions</th>
<th>Operations Worldwide</th>
<th>Operations in Africa</th>
<th>Global Revenues</th>
<th>EBTIDA Margin</th>
<th>Earnings After Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTN</td>
<td>200M</td>
<td>22</td>
<td>15</td>
<td>USD 11B</td>
<td>43%</td>
<td>USD 2.7B</td>
</tr>
<tr>
<td>Airtel</td>
<td>221M</td>
<td>20</td>
<td>16</td>
<td>USD 14.7B</td>
<td>31%</td>
<td>USD 418M</td>
</tr>
<tr>
<td>Africell</td>
<td>~12M</td>
<td>4</td>
<td>4</td>
<td>~USD 305M</td>
<td>41% (2012)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: CSP financial statements
6.8 In 2014, Orange sold its operation in Uganda to Africell. The new group also has operations in Gambia, Sierra Leone and the Democratic Republic of the Congo. It is a much smaller corporation than the Orange Group, which may reduce the benefits of vertical integration Orange has previously enjoyed. Arguably, Africell will also have different credit conditions than those of Orange currently has.

6.9 With Orange Group exiting Uganda, the market has two significant international MNO groups left: MTN, and Airtel, each with significant presence in the African continent. This creates advantages to them in terms of revenues, investment power and access to capital compared to the other major MNOs (Orange/Africell and Uganda Telecom) in accessing resources.

6.10 In contrast, these smaller players may have less choice than the larger MNOs in deciding whether to purchase or retain CSPI services, as they do not have access to sufficient resources to consider full self-supply as a viable long-term option.

6.11 As such, we find this criteria to be relevant and applicable to this SMP analysis.

**Control of Essential Upstream Inputs**

6.12 Upstream inputs to the CSPI market include commodities such as steel, fuel and electricity. The supply of these inputs presents no cause for concern within this market assessment. Access to land or building sites on which to locate CSPI could potentially raise constraints, but if this occurs it would be highly localised.

**Access to Sales and Distribution Channels**

6.13 There are no indirect sales and distribution channels in this market. Buyers and suppliers are all known to one another and engage in direct sales. As such, this criteria is not applicable to this SMP analysis.

**Transparency**

6.14 The negotiation of CSPI tenancy agreements between MNOs and tower companies takes place between, in general, representatives with the experience and resources to make informed decisions regarding economics of each party’s proposals. In other words, we would expect there to be a high level of transparency between negotiating parties, notwithstanding the negotiating parties’ respective strategies and tactics.

6.15 As discussed in Section 4, above, MNOs typically negotiate preferential terms with tower companies for the ongoing use of towers divested in a sale-and-leaseback deal. These terms will differ from the terms that would apply to the MNO for access to other towers and details are not made public.

6.16 In interviews, stakeholders stated that aside from the sale-and-leaseback situation, the market operates on a defined rate card basis, with variable discounting possible depending on the scale of leasing. Although price and product information is not available publicly, rate cards are submitted to UCC annually along with licencing renewal submissions that detail the suppliers’ business cases.

6.17 Analysis of pricing data shared with the UCC reveals that prices vary greatly from one customer to another. The differences are often complex and are not clearly explained. We recommend that the UCC increase its understanding of the difference between submitted rate cards and agreed pricing structures with customers.

6.18 Greater transparency could also be achieved in non-price terms, such as equipment specification & approvals and SLAs. These are not publicly disclosed.
In summary, the level of transparency of price and non-price terms is of concern. In particular, any special terms negotiated in sale-and-leaseback deals or obtained on a volume basis must be further assessed, as this is not currently well-understood by the UCC.

**Ease of Consumer Switching**

There are different forms of agreements that tower companies and MNOs enter into. A Master Lease Agreement (MLA) is an umbrella contract between tower companies and MNO that sets out key price and non-price terms of each site lease agreement.

Site Lease Agreements (Site LAs) are made on a site-by-site basis, meaning that an MNO can have several MLAs and Site LAs with multiple tower companies.

In entering a tower purchase agreement, a tower company typically also agree an MLA and Site LAs. They may also agree a Build-to-Suit (BTS) agreement that ensure that the MNO will be an anchor tenant for an agreed number of new sites in the country. This is the case in Uganda between MTN and ATC, and Orange and Eaton.

Contracts are typically 10 years long with costly exit clauses, meaning MNOs are largely bound to them.

At the end of the contracts, an MNO may switch provider. In order to switch to new CSPI provider, the MNO must incur some costs through the new provider. These include the cost to remove equipment from a site (levied by the existing provider) and install it at a new site (levied by the new provider), and the cost of any possible signal downtime due to this change.

However, the MNO can only switch towers to a desired location if there is an existing tower there or if a new tower is built there either by the MNO or another supplier. Building new towers comes at significant upfront cost, and as discussed in the section on barriers to entry, permissions and other agreements are required before a tower can be built.

Conversations with stakeholders have indicated that they have switched to self-supply for specific types of sites that they believe that can self-supply more cheaply. For example, Orange Uganda returned to building and operating its own CSPI on rooftops in urban areas as they found this cheaper than using a tower company.

However, to fully return to self-supply for the entire network is prohibitive for an MNO. For a network of 700 to 1000 towers (the approximate size of a nationwide tower network in Uganda), this would cost approximately USD 105M to 173M, a significant amount. Alternatively, an MNO may also consider the repurchase of their CSPI from the tower companies, but this may not be possible if it is being shared or if the SP does not wish to sell. It is also costly, with the average tower valued at upwards of USD 135,000 in African markets today.

As a result of these factors, we find this criteria to have relevance to the SMP analysis.

**Countervailing Buyer Power**

There are 8 significant customers in the market: MTN, Airtel, Orange, UTL, Smart, Smile, Afrimax, and One Solutions. Smaller tier 2 enterprise customers also exist though they are too insignificant in size and scope to consider in detail in this analysis.
6.30 The largest customers in the market are MTN and Airtel by virtue of their having the widest network coverage and greatest capacity needs to serve their respective large retail mobile subscriber bases.

6.31 There are four main suppliers in this market, ATC Uganda, Eaton Towers, Airtel (via a subsidiary) and Uganda Telecom. Broadcast passive infrastructure owners such as UBC and MultiChoice are not included in the CSPI market definition.\(^9\)

6.32 In this market, there are a limited number of suppliers and buyers. If a large customer leaves, the supplier is greatly affected and may even go out of business if its customer base is not diversified enough. Conversely, an MNO can only choose from a few suppliers, some of whom are direct competitors at the retail and wholesale levels.

6.33 Regardless, leaving a supplier entirely is costly, particularly to return to self-supply as discussed in the previous section. Switching some business to a different supplier or returning to partial self-supply is a more viable option. Orange, for example, self-supply rooftop sites again as they found this to be more cost-effective than using those of the tower companies.

6.34 As such, we find that MNOs have countervailing buyer power in the market which limits the tower companies’ ability to exert market power.

**Evidence of Dynamic Competition**

6.35 The CSPI market is still relatively young and we are yet to see evidence of price-based dynamic competition. Monitoring the tower companies’ rate cards over time will identify whether competition on price emerges as the tower companies vie for incremental MNO business.

6.36 Improvements seen in the quality of the service offered by tower operators is an indicator of non-price competition. Tower companies have invested in improving CSPI infrastructure and security to increase the up-time of towers. ATC Uganda has also invested in connecting towers to the electricity grid to further increase up-time and differentiate its service from its competitors that rely on diesel generators.

6.37 Furthermore, while this market is expecting further consolidation, SPs are actively looking for ways to reduce operating costs and limit the need for further investment in new infrastructure. This helps them to offer more competitive rates to prospective tenants.

6.38 Competition is thus primarily based on the quality of towers and the offered rates. There is some evidence of competition between tower companies resulting in product and service improvements.

**Joint Dominance**

6.39 The fact that Eaton Towers and ATC Uganda joint market share is 57% in 2014 and that this is expected to increase to 74% in 2015 following Eaton Towers anticipated acquisition of most of Airtel’s CSPI assets, is not sufficient in itself to conclude joint dominance.

\(^9\) As discussed in the UCC Relevant Market Report (2014), broadcast infrastructure is in Uganda are built in locations optimised for the use of broadcast antenna. These locations are suboptimal (from a technical perspective) when used for mobile for fixed wireless antenna, and hence, only used in rare circumstances. As a result of this lack of substitutability, broadcast passive infrastructure was excluded from the market definition of CSPI.
Other structural characteristics that would need to be identify in order to conclude joint dominance include:

- Whether there is an incentive to coordinate;
- The ability to coordinate;
- The ability to detect cheating;
- The ability to enforce compliance; and,
- The absence of other market constraints.

The tower company business model primarily consists of three types of transaction. There is the initial bulk acquisition of tower assets through sale-and-leaseback, the ongoing incremental sale of tower capacity (on existing or build-to-suit towers), and the renewal of the lease agreement at the end of the initial term. It is useful to consider whether the necessary structural characteristics for joint dominance would be fulfilled in any of these situations.

The initial acquisition of tower assets is conducted through confidential negotiations between the MNO and the tower companies. Each of the tower companies will value the assets based on a cashflow forecast. The valuations may differ depending on operational and capital costs and the potential for synergies with existing tower assets. It could be argued that there is an incentive to coordinate in this initial acquisition to drive a lower purchase price. However, it is unclear that there is an effective mechanism to do so as the negotiations are confidential and deal terms are not published making it hard to detect cheating. Nor is it clear what mechanism would be used to enforce compliance given there are very few of these large deals and they have a long contract term. Finally, the MNO always has the option of walking away from a tower sale if the price is too low which places a constraint on the scale of price reduction that could be obtained through collusion.

The second situation is the ongoing incremental sale of tower capacity. The tower companies maintain rate cards for these incremental leases which provides a potential mechanism for coordination. However, as previously noted, tower companies have a strong incentive to maximise the tenancy rate on their towers as multi-tenancy dramatically increases the profitability of a site. This dynamic reduces the likelihood that tower companies would have sufficient shared interest to coordinate prices. It's also worth noting that each tower is unique in terms of its exact location and available capacity for siting equipment at the desired height. These differentiating factors will be considered in MNO purchasing decisions. Price will also be a factor, and it is reasonable to believe that an MNO would take an inferior tower (within limits) if sufficient discount was offered. In this situation, coordination could in theory take the form of a tacit agreement not to offer discounts for inferior towers. This agreement could hold if the quality competitors’ tower stock was broadly balanced.

Returning to the ability to coordinate on these incremental tower leases, the ability for tower companies to offer discounts mitigates against the rate card being used as a mechanism for collusion. The terms of individual leases are not made public making detection of cheating difficult. If cheating was detected, punishment could take the form of aggressive discounting in future deals.

Finally, we consider the third type of transaction: the renewal of tower leases at the end of their initial term. At this point, the MNO will generally prefer to renew the lease to avoid the high switching costs of relocation to alternative towers. The incentive to coordinate would therefore be to maintain pricing power. This could be effected through a tacit agreement not to compete aggressively to incentivize
switching. As with the initial sale-and-leaseback deal, we would expect these large renewal deals to be achieved through confidential negotiations. As this is essentially a re-negotiation, the rate card does not provide a mechanism to coordinate. It is also not clear what mechanism would be used to enforce compliance given the small number of these large deals and their long contract term.

6.46 In terms of market constraints we note that MTN and Airtel do business with ATC and Eaton Towers in a number of other countries. This international dimension increases the countervailing buyer power of these MNOs and is likely to ensure that a good relationship is maintained at a group level for these customers. The smaller MNOs in the market do not have this extra leverage, and are therefore more exposed to exploitation by the tower companies, should the tower companies not offer the same terms as provided to MTN and Airtel.

6.47 In conclusion, we do not see strong evidence for joint dominance in any of the three transaction types. The greatest risk appears to be in the lease renewals for smaller MNOs which is still several years away. We therefore recommend that the UCC pay particular attention to these transactions when they come up in the future. More broadly, increased visibility of the terms and conditions of tower leases for all MNOs will help the UCC monitor this market to protect against joint dominance.

7 Basic Market Conditions

Technology

7.1 The Passive infrastructure of mobile networks is low-tech. The main elements are the tower, power generators and secure housing for the radio network equipment.

7.2 In contrast to the network electronics, there is limited scope for technological advancement in this market. There is some scope for process optimization, e.g. managing fuel logistics, in which tower companies are likely to be more efficient than MNOs. However this intellectual property is unprotected and MNOs could acquire and adopt best practice if they chose to do so.

7.3 Components of a monopole cell site are shown in the diagram below.
These components are:

1. **Whip Antenna**: Omnidirectional antenna mounted vertically
2. **Standard (Panel) Antenna**: Transmits signal from tower to mobile device
3. **Microwave Antenna (Dish)**: Used for backhaul of traffic from mobile switching centre to site. Alternatively, these can be used as backup to a fibre-based set-up
4. **Reinforcement Bars**: Added to monopoles to allow them to bear more weight
5. **Shelters**: These house base stations, which are the active network component of a cell site. Antennae are connected by cable or fibre to the base station
6. **Antenna Arrays**: Three-sided platform that holds standard directional antennae. It allows for splitting a cell into three sectors
7. **Coaxial Cable/Fibre**: Lines which carry signals between the antennae and base station
8. **Power Generator**: For back-up power during outages on the electricity grid. In most rural areas, the power generator is the primary source of power at the site and must be refuelled regularly
9. **Ground Space**: Leasable area of tower site; typically owned by local property owner & leased by tower operator or MNO. A fixed amount of space is normally provided as part of a standard lease, with additional space available for a further fee.

**Cost Conditions**

7.5 Mobile towers are characterised by high upfront capital costs and low ongoing operational costs. The upfront capital investment includes the steel work for tower, the secure equipment housings, generators, planning costs and construction. Additional costs may be incurred if the site is connected to the electricity grid.

7.6 Build cost of towers is between USD 150,000 and USD 173,000 in developing countries, based on benchmark data from African tower companies and MNOs.

7.7 Ongoing costs primarily relate to fuel for the generators, electricity supply (if the site is on the grid), security and maintenance. Other costs include vehicle costs (particularly to deliver equipment and fuel to rural sites), site insurance, network operation centre running costs, and site lease costs.

7.8 The opex cost structures of individual tower companies vary depending on whether the site is connected to the electricity grid or not. For sites not connected to a grid, diesel fuel for generators is a significant cost driver, contributing up to 60% of total opex, whereas for sites connected to the grid, power costs account for approximately 15%.

7.9 The majority of capital and operational costs are direct variable costs, i.e. they relate directly to the towers under management. There are relatively few common costs.

7.10 For Ugandan tower companies, manpower accounts for approximately 20 to 25% of monthly expenses while site improvement, electricity and other costs account for 40 to 50% of expenses.

7.11 Replacement and repair of equipment due to theft or vandalism accounts for a small amount of ongoing capex but detailed data was unavailable at the time of writing.

7.12 As inputs are predominantly sourced within Uganda, they are less sensitive to exchange rate fluctuations.

8 **Overall Conclusion of SMP Assessment**

8.1 Our initial view is that the tower companies in the CSPI market currently do not have SMP. This conclusion is based on the observed recent growth in the number of CSPI sites; the improving quality of service offered by CSPI operators; and, even though there are only two tower companies, there is little incentive or opportunity to coordinate their actions, particularly given the MNOs’ ability to build their own CSPI.

8.2 The number of CSPI sites grew at approximately by 17% on average between from 2012 to 2014Q2. This growth followed entry of the two tower companies, Eaton Towers and ATC Towers. This growth in the number of CSPI sites is expected to be a lower bound for the increase in MNO cell sites, and the entry into the market of specific CSPI operators as resulted in MNO increasingly co-locating on CSPI sites. Furthermore, feedback from MNO during interviews is that the quality of service provided by the tower companies has improved since their entry into the market.
8.3 These observations suggest that MNO geographic coverage is increasing with the increase in the number of CSPI sites and the average number of cell sites per CSPI site. This in turn is expected to improve the quality of service that mobile users receive, in general. These observations also consistent with the view that CSPI market is competitive. The two tower companies not only place competitive pressure on each other, but MNOs are also able to place competitive pressure on the market because they are able to build their own CSPI and bypass the tower companies.
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