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Cross-border Expansion and Competitive Interactions of Indigenous Mobile Network

Operators in Sub-Saharan Africa

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Biosketches

Marcellinus C. Dike is completing his PhD at the Aalto University School of Business. His doctoral research focuses on the cross-border expansion and competitive interactions of mobile network operators in Sub-Saharan Africa. His broad research interests lie in emerging markets, where he explores the international strategies of multinational enterprises, regarding their foreign direct investment location choices, entry strategies, and competitive interactions.

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Executive Summary

Emerging-market multinational enterprises (EMNEs) have become major players in the global economy, with an increasing share of global Foreign direct investment (FDI). Indigenous Mobile network operators (MNOs) in Sub-Saharan Africa (SSA) are not left out in this pursuit, as they seek growth and competitiveness beyond their domestic markets. We investigate the FDI location choices and competitive interactions of the five indigenous SSA MNOs that had internationalized as of 2014 and find that, contrary to the literature, these EMNEs, operating in a key and rapidly-developing industry, did not tend to commence their cross-border expansion in geographically-close markets. In addition, the MNOs are more likely to invest in countries with stronger control over corruption, and do not appear to engage in heavy head-to-head competition with their rivals. These findings contribute to the internationalization literature in the context of the investment and competitive behaviors of the currently-underexplored indigenous SSA multinationals.

Key Words: Sub-Saharan Africa, Competitive interactions, Emerging market multinational enterprises, Mobile network operators, FDI

Introduction

Spurred by the quest for gaining access to markets and natural resources, along with enhanced operational efficiency and competitiveness, Emerging-market multinational enterprises (EMNEs), including those from developing and transition economies, have become major players in the global economy. EMNEs are said to have accounted for an increasing share of global Foreign direct investment (FDI) (Kedia, Rhew, Gaffney, & Clampit, 2015; McAllister, & Sauvart, 2013; UNCTAD, 2014). The stock of Outward FDI (OFDI) by EMNEs grew rapidly, from less than 5% (US \$11.9 billion) in 1990 to 29% (US \$328 billion) in 2010 (UNCTAD, 2011). In addition, the

contribution of EMNEs to global OFDI was estimated to be on the order of 36% (US \$486 billion) in 2014 (UNCTAD, 2015; Thirlwell, 2015).

With this strong influence on the global economy, EMNEs now constitute an important global phenomenon, attracting the attention of both academics and practitioners who seek to gain more understanding about the foreign-market investment behaviors of this category of firms, especially with respect to how they expand operations into, and compete in, foreign markets. Thus, the combined issues of cross-border expansion and competition have been the subjects of ongoing debate in the academic literature, as scholars employ a variety of theoretical perspectives to investigate the foreign market investment and competitive behaviors of Multinational enterprises (MNEs), including those in both the manufacturing and service sectors.

Still, our understanding to date has been based predominantly on the experiences of MNEs from developed markets (Chittoor, 2009; Guillén & Garcia-Canal, 2009; Madhok & Keyhani, 2012). Based on the argument that the international trajectories of EMNEs may differ from those of their developed-country counterparts (Mathews, 2006; Luo & Tung, 2007; Rugman, 2009; Gaur & Kumar, 2010; Narula, 2012; Ramamurti, 2012; Aharoni, 2014), there have been calls for EMNE-specific cross-border expansion studies (Cuervo-Cazurra, 2012).

Given the wide market and institutional discrepancies between developed- and emerging-market regions (Ghemawat, 2007; Hoskisson, Eden, Lau, & Wright, 2000; Khanna & Palepu, 1997), findings based on studies embedded in developed-market contexts are expected to offer incomplete insights into the behaviors of firms in emerging-markets. Thus, making conjectures about EMNEs based on such studies may be very misleading. For example, the fact that EMNEs necessarily develop capabilities related to operating in challenging institutional and home market

environments means that we need to be taking a more nuanced and context-specific view of their internationalization strategies (Arnold & Quelch, 1998; Khanna, Palepu, & Sinha, 2005; London & Hart, 2004; Meyer, Estrin, Bhaumik, & Peng, 2009).

While there has been a growing body of literature on the internationalization of EMNEs (Eren-Erdogmus, Cobanoglu, Yalcin, & Ghauri, 2010; Gaur, Kumar, & Singh, 2014; Yiu, Lau, & Bruton, 2007), the telecommunications industry remains underexplored, as much of the extant work has focused on developed-market-based participants (e.g., Clegg & Kamall, 1998; Clifton, Comín, & Díaz-Fuentes, 2011; Curwen & Whalley, 2006; Fernández & Usero, 2007; Gerpott & Jakopin, 2005; Jakopin & Klein, 2012; Pogrebnyakov, 2007; Sarkar, Cavusgil, & Aulakh, 1999; Whalley & Curwen, 2006). Our search of the literature revealed only two studies, that have focused on the cross-border expansion of emerging-market Mobile network operators (MNOs¹); Alkaabi, Demirbag, and Tatoglu (2010) did so from the perspective of Qtel's (Qatar Telecom) expanding beyond its domestic market, Qatar, while Lisitsyn, Sutyryn, Trofimenko, and Vorobieva (2005) was based on Russian MNOs' expansion into the Commonwealth of Independent States.

Two key gaps are evident. First, the context of Sub-Saharan Africa (SSA²) has not been addressed. Second, the international expansion of emerging-market MNOs has been explored solely with regard to the focal firms themselves, without consideration of the competition from rivals also operating in foreign markets. SSA is the world's second fastest-growth economic region (World Bank, 2014; IMF, 2014), after the Asia Pacific region, as well as home to the world's most rapidly-expanding mobile telecom industry (GSMA, 2017). The intensification of MNO activities

¹ An MNO is a telecommunications firm that owns and controls both radio spectrum licenses and the network infrastructure capable of delivering wireless voice and data communications to subscribed users.

² SSA comprises a total of 49 African countries, including the 43 mainland countries lying below the Sahara Desert and six island countries in both the Atlantic and Indian Oceans.

in this region makes it important to develop an understanding of how SSA-based MNOs have expanded across borders and competed in an environment characterized by notably rapid uptake of mobile telecom services.

In much of the SSA region, mobile service has effectively leapfrogged the chronically-inadequate land-line telephony. Mobile telephones are thus used for much more than calls and text messages. In addition to Internet browsing and social networking, mobile banking (mobile money) is important and growing rapidly (Shadbolt, 2015; The Economist, 2016; VOA News, 2015). GSMA (2016) reports that 55% of the 271-global live mobile money services are found in the SSA region, which also accounts for more than 63% of the active global mobile money accounts worldwide; GSMA (2017) reports that 140 live mobile money services were operational in 39 SSA countries at the end of 2016. Thus, while SSA's mobile subscriber penetration rate still lags the global average (43% vs. 63%, per GSMA (2016)), the region's huge population – approximately one billion – provides strong opportunities for MNOs and incentives for the firms to expand their operations through FDI.

Given its remarkable diversity in terms of market size, culture (including language), level of economic and infrastructural development, political stability, and historical orientation, SSA is an extremely interesting context in which to explore cross-border expansion and competitive interactions. In this study, we aim to shed light on how MNOs originating from SSA have expanded across national borders and competed in their home regional market. There were five such SSA-based MNOs with substantial cross-border activities as of 2014; we investigate the patterns of their international expansion and competitive interactions. Our study is guided by the

research question: “How do the indigenous MNOs from Sub-Saharan Africa internationalize and compete with each other?”

By addressing this two-part research question, we extend the literature on the internationalization and competitive interactions of EMNEs in the mobile telecom industrial subsector. Building upon theoretical frameworks pertaining to internationalization, and especially multimarket competition, we investigate how MNOs indigenous to SSA have expanded across national borders and competed with rivals within the region, from the inception of the mobile telecom industry in the late 1980s. In the process, we aim to add to the body of knowledge pertaining to cross-border expansion and competitive interactions of MNEs from the underexplored SSA context (Zoogah, 2008; Acquah, Zoogah, & Kwesiga, 2013; George, 2015; Amankwah-Amoah, 2016; George, Corbishley, Khayesi, Haas, & Tihanyi 2016).

The mobile telecom industry has some quite specific characteristics that affect firms’ expansion and competitive behaviors. This is a strictly-regulated industry with high entry barriers (Bourreau & Doğan, 2001; Clifton et al., 2011; Nicolaides, 1994; Sarkar et al., 1999), offering services that are very technology-oriented (Ferreira Ribeiro, Oliveira De Miranda Jr., Borini, & Bernardes, 2014; Johansson, 1994; Kim, Lee, & Kim, 2009). The number of MNOs operating in most countries is quite low, creating a highly-concentrated environment (Gruber, 2001; Gruber & Verboven, 2001). The mobile telecom industry is also viewed as highly strategic, in terms of national security and economic growth (OECD, 1991; Teece, 1991), which leads to the high likelihood of government involvement in the activities of MNOs.

Thus, our study contributes to both academic theory and managerial practice. Highlighting how indigenous MNOs have expanded and competed across SSA adds to the emerging-market

literature. Exploring the cross-border expansion and competition of these emerging-market MNOs operating in their dynamic and diverse home region allows us to contribute to both the international business and strategy literatures. Our findings reveal some clear distinctions, relative to conjectures based on the extant literature pertaining to internationalization and international competition. From the perspective of practice, we create a knowledge base to support the learning of indigenous MNO managers (both incumbent and prospective), for creating or enhancing own strategies pertaining to cross-border expansion and competitive interaction.

Theoretical Background

Given that international expansion offers potential for economies of scale and enhanced competitive advantages (Ghemawat, 2007; Penrose, 1995; Porter, 1986; Sapienza, Autio, George, & Zahra, 2006), firms are incentivized to expand operations beyond their domestic markets. Operating in foreign markets is, however, risky (Brouthers & Brouthers, 2001; Johanson & Vahlne, 2009; Bouncken, Cesinger, & Kraus, 2014), and may have a negative influence on performance (Lawton & Harrington, 2006; Kumar & Singh, 2008); hence, internationalization has serious implications for managers, who are concerned with the choice of markets in which to invest and the most cost-effective entry strategies to adopt (Kraus, Ambos, Eggers, & Cesinger, 2015).

Henten (2001) and Einhorn (2002) indicate that the commercial cross-border supply of telecom services had been in existence since the inception of telecom as an element of the offers of fixed-line providers. However, Johansson (1994) contends that “real” internationalization of wireline telecom operators did not occur until the 1980s, when telecom carriers began to buy equity shares in foreign operators and to create new ventures abroad, following the privatization of state-owned incumbents and the opening up of fixed-line markets to competition. According to Serrano,

Bane, and Tunstall (1991), a record 300 telecom diversification ventures took place across 60 countries in 1986-1991. Gerpott and Jakopin (2005) note that cross-border expansion of telecom gained an additional boost in the early 1990s, following the introduction of cellular or mobile communication (Stuber, 2011) and the granting of GSM (Global System for Mobile Communication) licenses to both local and foreign operators to compete with state-owned incumbents (Clegg & Kamall, 1998; Whalley & Curwen, 2005; Gerpott & Jakopin, 2008; Sarkar et al., 1999; Stienstra, Baaij, Van den Bosch, & Volberda, 2004).

The literature identifies several factors as having driven internationalization among MNOs. In addition to previous international experience of the firm, business-friendly host-country regulatory and market environments (Kim et al., 2009; Clifton et al., 2011), which served to heighten competitive pressures in domestic markets (often due to diminishing growth potential), increasing subscriber acquisition costs, and shrinking average revenue per user (Graack, 1996) (Pogrebnyakov, 2007; Eggers, Grajek, & Kretschmer, 2012) rank among the major drivers.

Internationalization in the mobile telecom industry was also the outcome of other forces; including the quest to establish an international presence and consolidate subscriber bases for revenue growth (Clegg & Kamall, 1998; Kim et al., 2009). The desires to leverage knowledge and expertise – or ownership advantage – acquired through domestic operations (Gerpott & Jakopin, 2005), exploit early-mover advantages (Sarkar et al., 1999; Bijwaard, Janssen, & Maasland, 2008; Jakopin & Klein, 2012), and achieve prompt return on investment (Ahmad, 2014) were additional motivators. The internationalization of mobile telecom was further prompted by MNOs' quests for gaining economies of scale and scope (Stienstra et al., 2004) and acquiring new knowledge (Clegg & Kamall, 1998).

Whereas MNOs have strong incentives to embark on foreign-market operations, it is important to note that they also face barriers that create boundary conditions for internationalization. Given the nature of telecommunications, especially with respect to national security and economic development (OECD, 1991; Teece, 1991), the industry is very important to governments. Thus, the entry of new MNOs into any country is strictly regulated (e.g., Bouckaert, Van Dijk, & Verboven, 2010; Grajek & Röller, 2012), and governments tend to limit the number of operating licenses that can be issued to new entrants. Bolstering this view, our preliminary study reveals that there were, on average, 3.5 MNOs (including both multinational and single-market firms) per SSA country as of 2014. Of the 49 countries in the region, six, including Comoros, Djibouti, Eritrea, Ethiopia, Sao Tome and Principe, and Swaziland, still operated monopoly mobile telecom markets as of 2014, suggesting that cross-border expansion of MNOs into these countries was either not possible or subject to barriers that were prohibitive.

There is considerable variation in the approaches that MNOs have adopted in their internationalization. Al-Kaabi, Demirbag, and Tatoglu (2010) find that some MNOs internationalized in stages, in a manner consistent with the Uppsala model (Johanson & Vahlne, 1977). There is also evidence that many MNOs have been more regionally-focused in their foreign investment (e.g., Whalley & Curwen, 2005; Pogrebnyakov, 2008), consistent with Rugman and Verbeke (2004), investing first in their home regions before venturing afield. Yet, Pogrebnyakov and Maitland (2011) contend that many of the mobile telecom firms have crossed borders more rapidly, in contrast to the stepwise approach described in the Uppsala model. For instance, Sarkar et al. (1999) note that MNOs have tended to internationalize at different paces. Gerpott and Jakopin (2005) argue that the fit between an MNO's idiosyncratic market environment and its resource base determines the firm's willingness to internationalize; hence, the degree and pattern of

internationalization among MNOs vary with time. Some former national incumbent operators, including Telefonica, crossed borders much more vigorously than others, such as British Telecom (Clifton et al., 2011).

As Clegg and Kamall (1998) point out, countries with locational advantages, such as large population and strong economies, are generally favored for FDI in the mobile telecom sector. Cave and Vogelsang (2003) observe that an MNO's choices regarding markets and entry strategies depend heavily on the potential host country's investment in infrastructure and the prevailing level of access prices³. Higher access prices constitute an impediment to internationalization, as new entrants have to rely on established incumbents during the early phase of market entry (Cave & Volgelsang, 2003), which leads to a tendency for MNOs to enter new markets via Merger and acquisition (M&A), especially in markets with already-established mobile infrastructure (He, Lim, & Wong, 2006; Gerpott & Jakopin, 2008; Pogrebnyakov, 2008). Where mobile telecom infrastructure is lacking, market entry is more likely to be in the form of a greenfield wholly-owned or joint venture start-up, or investment in an existing MNO (Gerpott & Jakopin, 2005). Gerpott and Jakopin (2005) note that, while it is very challenging for start-ups to gain positive returns in the short run, equity share investments in existing MNOs make foreign market entry much faster and easier.

The competitive dynamics theoretical perspective argues that a performance-enhancing action undertaken by a firm often triggers reactions from rivals, who may consider the move as a threat to their own success (MacMillan, McCaffery, & Van Wijk, 1985; Chen & MacMillan, 1992;

³ Access prices are regulatory fees paid by a new entrant in order to have access to essential inputs provided by rivals in the host market. It is important to note that no single operator can provide all of the network facilities required to switch calls between all possible locations.

Chen & Hambrick, 1995; Smith, Ferrier, & Ndofor, 2001). Baum and Korn (1996) note that firms undertake both offensive and defensive competitive-advantage-generating actions vis-à-vis their rivals. One such competitive strategy is to follow a rival's foreign market investments, entering and establishing FDI positions in the same markets (Knickerbocker, 1973; Flowers, 1976; Ito & Rose, 2002; Rose & Ito, 2008).

This is especially pronounced among firms operating in an oligopolistic situation, such as that faced by many MNOs; the literature suggests that such firms have a tendency to match the international investments of their key rivals (Karnani & Wernerfelt, 1985; Yu & Ito, 1988; Head, Meyer, & Ries, 2002). Porter (1980) asserts that firms feel the effects of each other's competitive moves and are prone to counter them. In the presence of such follow-the-leader behavior, rival firms often find themselves facing each other simultaneously in a variety of different locations, creating multimarket competition (Karnani & Wernerfelt, 1985; Bulow, Geanakoplos, & Klemperer, 1985; Baum & Korn, 1996; Jayachandran, Gimeno, & Varadarajan, 1999). As oligopolistic firms have the ability – and the incentive – to be conscious of their rivals' actions (Greve, 1998), exploring such firms' mimetic competitive actions and reactions may offer deeper insights for cross-border expansion.

In the case of telecom, while Fernández and Usero (2009) contend that mobile operators have gained market share by adopting different competitive strategies, relative to their competitors, Gimeno et al. (2005) find evidence that U.S. telecom firms with large domestic market shares have generally tended to mimic each other's entry strategies when crossing borders. Other studies (Bouckaert et al., 2010; Grajek & Röller, 2012) suggest that competition in the mobile industry

depends on the regulations that make entry possible. Gauging the effect of competition on investment in telecom remains a challenge (Garrone & Zaccagnino, 2015).

Thus, the picture regarding how mobile telecom companies internationalize and compete remains unclear. In addition, the literature pertaining to this industry has generally focused on the activities of firms based in developed countries. This means that there is a need to undertake studies of EMNEs in the mobile telecom industry, in order to create a more complete conceptualization of the foreign market behaviors of MNEs in this field. Against this backdrop, and building upon the existing theoretical understanding, our study explores the cross-border expansion and competitive behaviors of the MNOs that are indigenous to SSA.

As the world's least mobile-penetrated region (GSMA, 2015), with strong projected economic growth (IMF, 2014; Deloitte, 2015), the investment situation faced by mobile telecom operators in SSA is very dynamic. While the market is dominated by foreign MNOs, there are also some very competitive indigenous (i.e., SSA-headquartered) firms that have expanded their operations to compete outside of their home-country markets. Given that cross-border expansion and competition affect the international strategy and performance of firms (Van Witteloostuijn, 1993; Gimeno, 1999; Greve, 2008; Kumar & Singh, 2008), including MNOs (Gerpott & Jokopin, 2005; Peppard & Rylander, 2006), we expect these indigenous MNOs to exhibit some context-specific cross-border behaviors that are contingent upon being embedded in the SSA business environment. Consistent with the argument that the nature of competitive rivalries influences firms' investment decisions (e.g., Gimeno, Hoskisson, Beal, & Wan, 2005), we posit that decisions around the choice of markets as investment locations are affected by rivals' competitive moves.

Given that inter-firm competition is a continuous process, it is logical to assume that competitive rivalries influence the MNO's decisions both prior to and after entry into the focal market.

Multinational Indigenous Sub-Saharan Africa MNOs

There were 16 MNOs with active multinational operations within the SSA regional market as of the time of this study. Of these, five were SSA-headquartered and thus considered to be indigenous; the non-indigenous MNOs included five with headquarters in developed markets and six with headquarters in emerging markets. In this study, we focus on the five indigenous SSA MNOs, whose internationalization profiles are summarized in Table 1.

-----Insert Table 1 about here-----

Theory Development and Hypotheses

The notion that cross-border activity offers potential for generating economies of scale and enhancing firm performance (e.g., Porter, 1986; Sapienza et al., 2006; Ghemawat, 2007) provides an explanation for why many firms, including emerging-market MNOs, choose to operate in foreign markets, despite the obvious challenges that come with international diversification (Brouthers, 1995; Hennart, 2009). To mitigate these challenges, choices around markets for investment and entry strategies are central to the cross-border expansion process of the firm, with managers aiming to select markets that they believe are most likely to offer cost-effective entry strategies at the acceptable levels of risk, while rapidly generating the desired return on investment. As SSA countries are developing and emerging markets, with numerous institutional challenges, the investment decisions of MNOs in the region are particularly complicated. Like other emerging markets, SSA countries have context-specific issues that may challenge the cross-border expansion of the indigenous MNOs, beyond the understanding common in the extant literature.

Previous studies indicate that MNOs tend to have firm-specific international entry strategies in emerging markets, typically using M&As to enter countries that have well-established capabilities for mobile operations (e.g., He et al., 2006; Gerpott & Jakopin, 2008; Pogrebnyakov, 2008). However, the factors that guide these firms' FDI location decisions remain unclear. Given that most of the SSA countries already had functional infrastructure for mobile, each being served by at least two established international and/or local MNOs since the early 2000s, potential entrants have reasonable M&A opportunities. Thus, MNOs considering international expansion in the region are likely to focus more on issues of market selection than on entry strategies; hence, we focus our study accordingly.

The Uppsala model (Johanson & Vahlne, 1977), which is widely-employed to explain the process of internationalization (Vahlne & Nordström, 1993), suggests that firms tend to develop their international market expansion gradually, beginning with geographically proximate markets, or those perceived to be psychically close, in terms of aspects including culture, institutions, and location – before entering more distant ones. Such markets are expected to be more easily understood by the investing firms, and to offer more familiar operating environments (O'Grady & Lane, 1996).

Eriksson, Johanson, Majkgard, and Sharma (1997) note that firms build on the experiential knowledge accumulated in the earlier markets for their subsequent foreign market entries. Thus, a stepwise investment pattern is presumed to offer learning opportunities that enhance the firm's foreign market knowledge base, which, when developed, can help to guide entry into less familiar and/or more remote markets.

Al-Kaabi et al. (2010) find evidence of staged approaches in the cross-border expansion of Qatar Telecom (QTel). Other studies (Clegg & Kamall, 1998; Whalley & Curwen, 2005; Curwen

& Whalley, 2006; Pogrebnyakov, 2008) have also suggested that many mobile operators exhibit regional tendencies in their international dispersion, entering closer-to-home regional (and subregional) markets before expanding farther afield; this is consistent with the Uppsala model, with respect to geographic and, to an extent, psychic distance. Given both the scale and diversity of the SSA region, we expect to observe similar behavior among the indigenous MNOs we are considering. Accordingly, we hypothesize:

Hypothesis 1. Indigenous MNOs in SSA have a higher propensity to begin their cross-border expansion in markets within their home subregions (i.e., Eastern, Central, Southern, and Western Africa).

Beyond geographic distance, the literature has long viewed country-specific factors as important to decisions regarding potential FDI locations (e.g., Andersen, 1993; Dunning, 1998). In the case of Africa, Asiedu (2006) notes that large countries with strong economic growth, better standards of living, favorable government and regulatory policies, and sound market institutions tend to be more successful in attracting FDI. Within the mobile telecom industry, there is strong evidence that MNOs tend to prioritize more attractive countries in their international investment location choices (e.g., Pogrebnyakov, 2008; Luiz & Stephan, 2012). Al-Kaabi et al. (2010) observes that populous countries with sound economic growth and high standards of living tend to generate rapid return on investment in the mobile telecom business and, as such, represent favorable investment locations.

There is little reason to expect that indigenous SSA MNOs will view things differently in this regard. We postulate, accordingly, that SSA country markets with favorable country-specific

factors such as large market size, high standards of living, and strong economic growth will be more attractive for investment among the indigenous telecom firms, and thus hypothesize:

Hypothesis 2A: Indigenous MNOs in SSA have a higher propensity to invest in countries with stronger economic growth.

Hypothesis 2B: Indigenous MNOs in SSA have a higher propensity to invest in countries with higher standards of living.

Hypothesis 2C: Indigenous MNOs in SSA have a higher propensity to invest in countries with larger populations.

The literature also emphasizes the importance of the institutional environments of the home and host countries in FDI decisions. As defined by North (1990), institutions are essentially the formal (legal) or informal (customs and traditions) norms and practices that determine how things happen within a society. Chao and Kumar (2010) demonstrate that institutional distance, a measure of similarity between the home and potential host countries, is related to firms' choices of FDI locations. The general assumption is that FDI is less complicated, and more likely to be successful, when the institutional environments of the home and host countries are more similar to each other, as the investing firm should then have better familiarity with how business is to be done in the host country. It is reasonable to assume that institutional similarity will pay even stronger dividends when the entry is made using M&A, given the need to deal simultaneously with both the host institutional environment and the merging of two corporate cultures.

In the developing- and emerging-market SSA context, the huge diversity of cultural norms, along with the region's colonial history, make some institutional measures particularly pertinent, e.g., countries' official languages, the presence of common colonial ties, and approaches to corruption. Shared colonial ties lead to similarities in legal systems, offering the potential to ease

the investing firm's navigation of the regulatory environment in the host country, reducing psychic distance. Corruption, a reality in much of the SSA region, is widely acknowledged to make doing business more difficult and less profitable. A common operating language also reduces the difficulty of doing business in a different environment, and hence the psychic distance; Bornadi (2004) and Pogrebnyakov (2008) find, for instance, that language plays an important role in the international expansion of MNOs. Hence, we hypothesize:

Hypothesis 3A: Indigenous MNOs in SSA have a higher propensity to invest in markets that share a common operating language with their home markets.

Hypothesis 3B: Indigenous MNOs in SSA have a higher propensity to invest in markets that share colonial ties with their home markets.

Hypothesis 3C: Indigenous MNOs in SSA have a higher propensity to invest in markets with stronger control over corruption.

Literature pertaining to multimarket competition provides strong evidence that firms operating in an oligopolistic environment have tendency to behave in rather specific ways. While these five indigenous MNOs may not form a traditional, market share-defined oligopoly, it is reasonable to assume that they pay particular attention to each other's investment strategies, given the highly-competitive and dynamic environment in which they operate. Knickerbocker (1973) notes the tendency of oligopolistic firms to respond to rivals' new-market FDI by establishing their own subsidiaries in those same markets, generating a follow-the-leader pattern. This oligopolistic reaction strategy is consistent with the competitive dynamics argument that successful actions undertaken by a firm may trigger reactions from its rivals, who consider the actions as threatening to their competitive positions (MacMillan et al., 1985; Chen & MacMillan, 1992; Chen & Hambrick, 1995; Smith et al., 2001). Such behavior has been observed across a variety of

manufacturing and service industries in different international contexts (Yu & Ito, 1988; Ito & Rose, 2002; Rose & Ito, 2008), and is posited to be associated with drivers as diverse as uncertainty and risk aversion (Head et al., 2002) and learning (Altomonte & Pennings, 2008).

Following a rival's FDI moves represents a very competitive strategy, as it may allow the firm to blunt the rival's early-mover advantage; this should be especially important in a rapidly-growing industry such as mobile telecom, particularly in an emerging-market region context. Chen and Miller (1994) posit that competing firms respond to rivals' investment moves in order to neutralize the effects of these moves and to signal their own readiness to fight back and engage in multimarket competition if further threatened. Similarly, Knickerbocker (1973) contends that rivals react to each other's competitive moves in an effort to maintain the prevalent equilibrium of competition, as well as to deter further actions. While most empirical findings in the international business literature have suggested the prevalence of such a bandwagon effect, it is also possible that some oligopolistic firms establish an explicit or implicit understanding and adopt an agreed-upon strategy that aims at avoiding excessively-intense rivalries and enhancing their joint (and individual) profitability (Yu & Ito, 1988). Mutual avoidance may also occur in the absence of collusion, driven by different strategic imperatives (Rose & Ito, 2008). Accordingly, both follow-the-leader and mutual avoidance are justifiable competitive strategies among firms in an oligopolistic industry. However, there is still much to learn about the motivations behind the use of these strategies or the post-entry dynamics of firms' behaviors following entry in a multimarket competitive environment.

Dike and Rose (2015) find evidence of oligopolistic reaction among MNOs in SSA, considering both indigenous and foreign firms. Thus, we expect to observe imitative FDI behaviors among the indigenous SSA MNOs, and hypothesize as follows:

Hypothesis 4: Indigenous MNOs exhibit oligopolistic reaction, specifically a bandwagon effect, as they compete with each other in the SSA region.

Data and Methods

We consider the population of international moves by indigenous SSA MNOs, through 2014. The data used to test our hypotheses come from online secondary sources, including company websites and the websites of the national telecom commissions associated with the home countries of the five indigenous MNOs: Postal and Telecommunications Regulatory Authority of Zimbabwe (<http://www.potraz.gov.zw>) for Econet, Nigerian Communications Commission (<http://www.ncc.gov.ng/>) for GLO, Independent Communications Authority of South Africa (<https://www.icasa.org.za/>) for MTN and Smile, and Sudan's National Telecommunication Commission (<http://www.ntc.gov.sd/index.php/en/>) for Sudatel. Data have also been collected from the databases of the Global System for Mobile Association (GSMA)⁴, the International Telecommunications Union (ITU)⁵, and the Global Economy⁶ and World Bank⁷ databases, as well as from media (newspaper and journal) publications. Consistent with Lincoln and Guba (1985), this combination of internal and external data sources aims to offer stronger validity for our study.

⁴ The GSMA is an industry association that represents nearly 1,100 companies working in the mobile telecommunications ecosystem (<https://www.gsma.com>).

⁵ The ITU is an agency of the United Nations (<http://www.itu.int>).

⁶ <http://www.theglobaleconomy.com/>

⁷ <http://www.worldbank.org>

We employ a variety of statistical approaches to test our hypotheses: binomial analysis (H1); binary logistic regression modelling (H2A-C and H3A-C); and hypergeometric analysis (H4), following Rose and Ito (2008). The data employed for the binomial and hypergeometric analyses, are shown in Table 1. We use the five MNOs' market entry locations and dates to test H1. The information regarding the markets in which each of the MNOs operates serves to identify instances of co-location; these data represent the input into the hypergeometric analysis used to test H4.

Consistent with past literature, we test H2A-C and H3A-C using logistic regression modeling. Our binary dependent variable takes the value of 1 if the indigenous SSA MNO has an FDI position in a country, and 0 otherwise. H2A-C all pertain to macro-level host-market attributes: economic growth, standard of living, and market size. We operationalize these attributes using the annual percentage of growth in GDP, GDP per capita, and population, respectively. These time-varying variables are each measured three years prior to the firm's entry into the specific market, under the assumption that such strategic moves require considerable planning; discussions with industry experts made it clear that a three-year lag is reflective of the typical decision-making process in this industry in the SSA region.

H3A-C address institutional attributes: language match and colonial ties between the home and host countries, and the control over corruption in the host country. Language match and colonial ties are operationalized using dummy variables (1 for yes and 0 for no). Our corruption measure is operationalized using the World Bank's Control of Corruption index, which is one of the World Governance Indicators. Combined for the World Bank from a wide variety of sources, this index represents the degree to which corruption has an impact of the country's business environment, with higher values presenting lower levels of corruption (see

<http://info.worldbank.org/governance/wgi/index.aspx#doc>) for more detail regarding the development of this measure.

In our models, we control for the percentage of the host-country population that was living in urban environments three years prior to the firm's entry, on the basis that high urban density should be preferable for the investing MNOs. We also include control variables for four of the five MNOs, leaving MTN as the base category.

Our dataset is restricted to those 22 countries in which at least one of the five firms of interest has a presence; omitting firms' positions in their home countries yields 107 firm-country observations. In light of two substantial, compensating outliers in one variable⁸, we undertake our analysis with and without those two values. Tables 2-5 show the variable information, descriptive statistics, and correlations for the variables used in the modelling.

-----Insert Tables 2-5 about here-----

Results

The SSA region is extremely diverse, culturally and institutionally. In H1, we posit that, consistent with the Uppsala model, indigenous SSA MNOs will begin their internationalization activities in geographically-close, and therefore more familiar, countries. We assess H1 by dividing SSA into four regions (Eastern, Western, Central, Southern), and considering the region(s) in which each MNO expanded in its first year of international activity. Using this admittedly-coarse measure, H1 receives no support, with only GLO remaining fully in its West region (Benin and Ghana) during its first year of internationalization. Using the binomial distribution to assess the significance of this one firm out of five, H1 is contradicted with $p < 0.10$

⁸ Our measure for economic growth, used to test H2a, is extremely low for Liberia in 2003 and extremely high for Rwanda in 1995; MTN entered Liberia in 2006 and Rwanda in 1998.

if we define “higher propensity” as 57% probability, and with $p < 0.05$ and $p < 0.01$ using 65% and 78%, respectively.⁹

The logistic regression results are shown in Table 6, for both the full data set and the reduced one (absent the two outliers with respect to economic growth). None of the estimated models suffers from multicollinearity, as shown by the low variance inflation factors (VIFs); to ensure that multicollinearity is not an issue, we estimate the models to test H3a and H3b separately, due to the understandably strong relationship between the language match and colonial ties variables. The Hosmer-Lemeshow p-values are all at least 0.05, which implies that each of the models fits relatively consistently across the range of the data; this is comparable to the necessary property of homoscedasticity in linear regression. The models all offer reasonable classification performance.

-----Insert Table 6 about here-----

Considering the control variables, each of the four firm-specific indicators adds significant explanatory power to the models, indicating a lower probability of investment, relative to MTN¹⁰, as expected from the information in Table 1. The host market’s percentage of urban population, on the other hand, does not add marginal explanatory power to any of the models.

The only hypothesis to receive consistent support is H3C, regarding corruption; the estimated coefficient is positive and significant (at least $p < 0.10$) in all four of the models (full and reduced), suggesting that stronger control over corruption is associated with a higher probability that the firm is present in the country, marginal to the other variables in the model. H2C, pertaining

⁹ Looking at it from a different angle, only three of the eight initial market entries (37.5%) undertaken by any of these firms were within their home regions, providing no support for H1.

¹⁰ We follow the standard practice of using the largest category as the base, to enhance the stability of the models; MTN has operations in the most countries among the five indigenous MNOs.

to population size, receives limited support ($p < 0.10$) when the outliers are removed and language match is included in the model, providing surprisingly weak evidence that the MNOs are drawn to larger markets. Unexpectedly, H2A is contradicted ($p < 0.10$) in the reduced sample, while H2B receives no support; in combination, these findings suggest that MNOs in SSA are not particularly driven by economic conditions in potential host markets. Institutional factors apart from corruption contribute no marginal explanatory power in our models, as none of the estimated coefficients associated with either language match (H3A) or colonial ties (H3B) differs significantly from zero.

Finally, we test H4, regarding oligopolistic reaction, using hypergeometric analysis; see Rose and Ito (2008) for a detailed description. Table 7 shows the actual and expected numbers of meetings between pairs of indigenous SSA MNOs; the expected numbers are calculated using the hypergeometric distribution, under the assumption that the MNOs make their market entry decisions independently of each other. We find no support for H4; rather, it is contradicted for Econet and MTN, who meet each other in significantly fewer markets than expected ($p < 0.05$), suggesting the potential for active avoidance between these Zimbabwean and South African firms.

-----Insert Table 7 about here-----

Discussion

These findings offer some new insights into EMNE internationalization, from the perspective of the cross-border investment behaviors that form part of indigenous firms' strategies within their home region. Contrary to stages models, for instance, these SSA-based MNOs did not tend to begin their international expansion with geographically-close markets. (It is also interesting to note that three of the indigenous MNOs, which are all from English-speaking countries, undertook FDI positions in French-speaking host countries during their initial year of

internationalization, in further contradiction to expectations regarding the minimization of psychic distance in early investments.) In addition, key country-specific factors, such as market size and standard of living, along with indicators of institutional proximity (common language and colonial ties between the home and host countries), all of which the literature advocates as important, are not found to be strong determinants of investment location choices for these SSA MNOs, marginal to the other variables included in the models. Somewhat curiously, we find evidence that the indigenous MNOs in our sample exhibit some preference for markets characterized by lower economic growth.

Despite a clearly-revealed preference for host markets characterized by stronger control over corruption, the dominant explanatory power of the MNO-identifying control variables suggests that market selection is quite firm-specific. The uniformly-significant coefficients associated with the company indicator variables make it clear that MTN is adopting an internationalization approach that differs markedly from those of each of its four indigenous competitors. Also unexpected is our finding that these indigenous MNOs show no evidence of follow-the-leader oligopolistic reaction with respect to entering SSA country markets. Rather, our analysis provides evidence of mutual avoidance between Econet and MTN, in contrast to the more commonly-observed bandwagon effect that characterizes some of the MNOs' competitive interactions in the SSA region when considering both indigenous and non-indigenous firms (see Dike & Rose, 2015).

Thus, we find consistent evidence that these indigenous SSA MNOs appear to be internationalizing in a manner that differs from that predicted by the literature. Such unexpected cross-border investment behavior, which also questions the home-region boundedness of MNO investment as posited by the literature, may be driven by many issues, including the firms' limited

resources, relative to their foreign competitors, especially early in their internationalization processes. The notion of constrained resources is also consistent with the significant differences between the internationalization strategies of MTN, which is substantially larger in terms of revenues, relative to the other four indigenous MNOs in our study.

Kedia et al. (2015) note that resource constraints may serve to heighten EMNEs' dependence on their home governments; it seems plausible that, especially in this highly-regulated industry in which many of the players have emerged from state-owned enterprises, government influence may factor into investment decision-making processes. In the rapidly-developing and highly-competitive SSA mobile telecom industry, informal relationships may also play particularly important roles in reducing psychic distance, leading to FDI patterns that differ from those predicted by the extant literature.

With respect to academic research, the unexpected findings of this study, relative to the literature, suggest the importance of more in-depth exploration of the foreign market behaviors and competitive interactions of EMNEs, especially those from the strictly-regulated mobile telecom industry in the complex and dynamic African continent. It would be incorrect to simply assume that these firms are necessarily similar to their developed-market counterparts, in terms of the strategies that drive international investment and competition. As the indigenous SSA MNOs are operating in the context of two levels of dynamic complexity – both regional economy and industry – exploring their cross-border expansion patterns and competitive behaviors provides insights that can add to the broader EMNE internationalization literature.

In the context of practice, our study provides insights that are worthy of consideration by managers and strategists of emerging-market firms, especially MNOs, which either seek international expansion or face competition from rivals. We find clear evidence that cross-border

expansion is not confined to geographically-close, obviously-familiar markets, and that market size and spending power may not be the most important attributes to consider when selecting new locations for FDI within the SSA region. Firms also appear to value better control over corruption, relative to stronger macro-economic indicators or the presence of colonial ties or a common language between home and host markets. Government officials should, therefore, note the strategic importance of tackling corruption in order to make their countries more attractive for inward FDI, even by firms from emerging-market home environments.

Conclusion

The growing influence of EMNEs, especially as major contributors to global FDI, has placed them at the forefront, in terms of firms whose international activities are receiving academic attention. Using secondary data derived from a variety of sources, we have investigated the cross-border investment location choices and competitive interactions of the five indigenous SSA MNOs that had undertaken FDI in multiple countries as of 2014. We find that these EMNE MNOs have adopted internationalization strategies that are quite distinct to those predicted by the existing theoretical perspectives, in terms of both their investment location choices and the manner in which they compete with each other across multiple markets.

Our analysis is, of course, subject to limitations. While our focus on how the indigenous SSA MNOs compete with each other reveals an important part of the competitive landscape, it does not give the full picture, as foreign firms also play important roles in this industry. The small number of indigenous MNOs also yields a small sample size that challenges the power of our statistical testing and our ability to employ more complex models. In addition, we are observing strategic outcomes, as opposed to the details of strategic processes; not surprisingly, given the competitive nature of the industry, the MNO managers have been reluctant to participate in

interviews. That said, the fact that we identify unexpected results, given the small number of observations, provides confidence that these firms truly are internationalizing using a different set of decision criteria.

Do we need new theory that is specific to Sub-Saharan Africa? We would argue against that path, on the basis that current theoretical perspectives lack strong predictive power even in the North American and European contexts in which they were developed. However, our findings suggest that the existing theoretical perspectives on internationalization and multimarket strategy would benefit from more nuance that accounts for the dynamic complexity of both the institutional and industrial environments in which EMNEs are operating. Given that the indigenous SSA MNOs in our study have tendency to behave in a manner unpredicted by – and even contrary to – the literature, it will be valuable for future studies to focus on identifying the forces that are actually driving these firms' internationalization. As our study was quantitative, and based on a population that included a small number of firms, we recommend that future research would benefit from the use of qualitative approaches for more in-depth investigation of the investment behaviors of these indigenous SSA firms. The combination of quantitative and approaches will contribute to developing a more holistic understanding of the cross-border investment and competitive behaviors of these – and other – EMNEs.

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Table 1. Market Entries of Individual SSA MNOs

Country	SSA Region	Official Language(s)	Econet (Zimbabwe)	GLO (Nigeria)	MTN ^a (South Africa)	Smile (South Africa)	Sudatel (Sudan)
Afghanistan	n/a	Dari, Pashto			2006		
Benin	West	French		2008	2006		
Botswana	South	English	2004		2005		
Burundi	Central	French	2009				
Cameroon	Central	French			2000		
CAR	Central	French	2014				
Congo	Central	French			2005		
Cote d'Ivoire	West	French		2009	2005		
Cyprus	n/a	Greek, Turkish			2004		
Ghana	West	English		2008	2006		2008
Guinea	West	French			2006		2012
Guinea Bissau	West	Portuguese			2006		
Iran	n/a	Persian			2005		
Kenya	East	English	2004				
Lesotho	South	English	2008				
Liberia	West	English			2006		
Mauritania	West	French					2007
Nigeria	West	English	2001	2003	2001	2013	
Rwanda	Central	English ^b			1998		
Senegal	West	French					2009
South Africa	South	English			1994		
South Sudan	East	English			2011		1993 ^c
Sudan	East	English			2005		1993
Swaziland	South	English			1998		
Syria	n/a	Arabic			2007		
Tanzania	East	English				2012	
Uganda	East	English			1998	2009	
Yemen	n/a	Arabic			2001		
Zambia	South	English			2005		
Zimbabwe	South	English	1998				

^a MTN is the only indigenous Sub-Saharan Africa mobile operator that has internationalized beyond Africa, with operations in Afghanistan, Cyprus, Iran, Syria, and Yemen.

^b English became the official language of Rwanda in 2009; previously, French had been the official language.

^c South Sudan was established in 2011, so Sudatel's 1993 investment did not constitute international activity.

Table 2. Descriptive statistics and variable descriptions – full sample (n=107)

Variable	Notes	Mean	Median	Std dev	Min	Max
Present?	1=yes, 0=no ^a	0.30	0	0.46	0	1
Economic growth of host country (GDP)	Annual percentage growth in GDP, measured three years prior to firm's entry into the specific country ^b	4.44	4.56	5.36	-30.15	35.22
GDP per capita (ln USD value + 10)	U.S. dollars, measured three years prior to firm's entry into the specific country ^b	7.73	7.76	0.72	6.36	9.55
Population (ln Million)	Millions of people, measured three years prior to firm's entry into the specific country ^b	2.29	2.38	1.22	-0.04	5.13
Language match between homes and host countries?	1=yes, 0=no	0.39	0	0.49	0	1
Colonial ties between homes and host countries?	1=yes, 0=no	0.27	0	0.45	0	1
Control of corruption	Index representing perceptions of the extent to which public power is exercised for private gain; -2.5 represents weak control and +2.5 represents strong control ^c	-0.70	-0.86	0.56	-1.51	0.92
Urban population (%)	Measured three years prior to firm's entry into the specific country ^b	37.73	39.28	14.28	9.62	64.10
Econet	Firm dummy; 1=Econet, 0=other	0.20	0	0.40	0	1
GLO	Firm dummy; 1=GLO, 0=other	0.20	0	0.40	0	1
Smile	Firm dummy; 1=Smile, 0=other	0.20	0	0.40	0	1
Sudatel	Firm dummy; 1=Sudatel, 0=other	0.20	0	0.40	0	1

^a Source: company and national telecom commissions websites

^b Source: <http://www.theglobaleconomy.com/> and <http://www.worldbank.org/>

^c Source: <http://www.theglobaleconomy.com/>

Table 3. Descriptive statistics – reduced sample (n=105)

Variable	Mean	Median	Std dev	Min	Max
Present?	0.29	0	0.45	0	1
Economic growth of host country (GDP)	4.47	4.56	3.03	-5.47	11.53
GDP per capita (ln USD value + 10)	7.75	7.78	0.70	6.54	9.55
Population (ln Million)	2.31	2.38	1.22	-0.04	5.13
Language match between homes and host countries?	0.39	0	0.49	0	1
Colonial ties between homes and host countries?	0.28	0	0.45	0	1
Control of corruption	-0.69	-0.86	0.57	-1.51	0.92
Urban population (%)	37.92	39.28	14.14	9.62	64.10
Econet	0.20	0	0.40	0	1
GLO	0.20	0	0.40	0	1
Smile	0.20	0	0.40	0	1
Sudatel	0.20	0	0.40	0	1

Table 4. Correlation matrix – full sample (n=107)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Present?	1.00										
2. Economic growth	-0.04	1.00									
3. GDP per capita (ln)	-0.12	0.00	1.00								
4. Population (ln)	0.03	0.13	-0.09	1.00							
5. Language match	0.02	-0.05	0.13	0.11	1.00						
6. Colonial ties	0.15	0.00	0.29**	0.18 [†]	0.76**	1.00					
7. Control of corruption	0.07	0.22*	0.40**	-0.37**	0.12	0.18 [†]	1.00				
8. Urban population (%)	-0.13	-0.12	0.41**	-0.19*	-0.12	-0.24*	0.08	1.00			
9. Econet	-0.03	-0.00	0.01	0.01	0.16 [†]	0.20*	0.02	0.02	1.00		
10. GLO	-0.12	-0.03	0.01	0.02	0.11	0.20*	-0.07	-0.00	-0.25**	1.00	
11. Smile	-0.17 [†]	0.07	0.05	0.02	0.02	-0.31**	0.03	0.04	-0.25**	-0.25**	1.00
12. Sudatel	-0.12	-0.02	0.02	0.01	-0.40**	-0.31**	0.04	0.02	-0.25**	-0.25**	-0.25**

[†] p < 0.10, * p < 0.05, ** p < 0.01, two-tailed tests

Table 5. Correlation matrix – reduced sample (n=105)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Present?	1.00										
2. Economic growth	-0.06	1.00									
3. GDP per capita (ln)	-0.07	0.04	1.00								
4. Population (ln)	0.05	0.17 [†]	-0.12	1.00							
5. Language match	0.01	0.11	0.14	0.12	1.00						
6. Colonial ties	0.18 [†]	0.00	0.28**	0.17 [†]	0.78**	1.00					
7. Control of corruption	0.10	0.34**	0.39**	-0.38**	0.12	0.17 [†]	1.00				
8. Urban population (%)	-0.11	0.02	0.41**	-0.20*	-0.14	-0.25*	0.08	1.00			
9. Econet	-0.02	-0.01	-0.00	0.00	0.16 [†]	0.20*	0.01	0.01	1.00		
10. GLO	-0.10	-0.06	-0.01	0.01	0.12	0.20*	-0.08	-0.01	-0.26**	1.00	
11. Smile	-0.16	0.12	0.03	0.02	0.02	-0.31**	0.02	0.03	-0.26**	-0.26**	1.00
12. Sudatel	-0.10	-0.04	-0.00	0.00	-0.40**	-0.31**	0.04	0.02	-0.26**	-0.26**	-0.26**

[†] p < 0.10, * p < 0.05, ** p < 0.01, two-tailed tests

Table 6. Logistic regression results

Variables	Full sample (n=107)			Reduced sample (n=105)		
	Controls	Testing H3a	Testing H3b	Controls	Testing H3a	Testing H3b
Constant	-1.72 (0.67)*	5.73 (3.39) [†]	6.22 (3.61) [†]	1.23 (0.78)	7.06 (3.93) [†]	7.99 (4.11) [†]
H2A: Economic growth		-0.06 (0.05)	-0.05 (0.05)		-0.20 (0.11) [†]	-0.20 (0.11) [†]
H2B: GDP per capita (ln)		-0.47 (0.45)	-0.62 (0.50)		-0.61 (0.51)	-0.82 (0.55)
H2C: Population (ln)		0.32 (0.25)	0.24 (0.25)		0.48 (0.27) [†]	0.42 (0.27)
H3A: Language match		-0.70 (0.63)			-0.64 (0.66)	
H3B: Colonial ties			0.12 (0.77)			0.21 (0.78)
H3C: Control of corruption		1.19 (0.56)*	1.03 (0.55) [†]		1.65 (0.65)*	1.54 (0.65)*
Urban population (%)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)	-0.02 (0.02)	-0.01 (0.02)	-0.00 (0.02)
Econet	-1.72 (0.67)*	-1.82 (0.69)**	-1.85 (0.70)**	-1.59 (0.67)*	-1.79 (0.72)**	-1.82 (0.72)**
GLO	-2.20 (0.74)**	-2.26 (0.75)**	-2.23 (0.74)**	-2.07 (0.73)**	-2.19 (0.77)**	-2.16 (0.76)**
Smile	-2.53 (0.78)**	-2.87 (0.86)**	-2.26 (0.84)**	-2.40 (0.78)**	-2.75 (0.88)**	-2.45 (0.92)**
Sudatel	-2.18 (0.71)**	-2.70 (0.84)**	-2.18 (0.71)**	-2.05 (0.73)**	-2.62 (0.87)**	-2.16 (0.87)*
Pseudo R ² (Nagelkerke)	0.24	0.31	0.29	0.21	0.30	0.29
Correct classification (%)	77.6	73.8	74.8	77.1	73.3	74.3
Hosmer-Lemeshow p-value	0.12	0.57	0.18	0.06	0.05	0.22
Maximum VIF	1.59	1.82	2.14	1.66	1.96	2.13

[†] p < 0.10, * p < 0.05, ** p < 0.01, two-tailed tests

Standard errors in parentheses

Table 7. Hypergeometric analysis of SSA meetings (expected numbers of meetings, assuming independent market selection, in italics)

	Total foreign countries	Econet (Zimbabwe)	GLO (Nigeria)	MTN (South Africa)	Smile (South Africa)
Econet	7				
Glo	4	0 1.1			
MTN	17	2 4.8*	4 2.7		
Smile	3	0 0.8	1 0.5	2 2.0	
Sudatel	6	0 1.7	1 1.0	4 4.1	0 0.7

* $p < 0.05$, two-tailed tests

For example, MTN operates in 17 SSA countries and Econet in seven. They compete head-to-head in two markets. Assuming that the two companies make their market entry decisions independently, the number of markets in which they would be expected to meet is 4.8, based on the hypergeometric distribution. Under the assumption of independence, the probability that they would meet in six or more markets is 0.02. Thus, they meet significantly less frequently than would be expected if their strategies were independent.