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# **The liquidity cost implications arising from the attraction of regional primary listings: Evidence from West Africa**

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## **Abstract**

This study reviews the liquidity costs for firms in outlying regions in primary listing on a centralized stock exchange. Using a unique hand-collected sample comprising all listed firms from across West Africa we find evidence that firms from outlying regions do have higher illiquidity costs although these can be mitigated from improvements in transparency that are associated with increasing familiarity amongst investment community of central exchange. This evidence has implications regarding the integration of stock exchanges in developing regions where this is likely to result in a greater concentration of liquidity mitigating intended optimal redistribution of capital and resources

JEL classification: G15; N20

Keywords: Liquidity, Liquidity Determinants, Emerging Financial Markets, West Africa

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## 1. Introduction

The worldwide wave of mergers of national stock exchanges that has resulted in formation of agglomerated entities such as Euronext in Europe and Scandinavia has been largely motivated by notions of cost reduction through exploitation of economies of scale and scope in the provision of trading and related support activities that leads to enhanced competitiveness of these integrated markets in attracting ever increasingly footloose global investment capital. Similar arguments regarding increased scale and scope efficiencies in exchange operations leading to competitive attraction of otherwise scarce global investment capital have underscored the formation of integrated regional capital markets in the developing world. One example is the 1998 extension of the existing capital market in Cote d'Ivoire to all other member states of the Francophone UMEAO<sup>1</sup> region in West Africa through the establishment of regional BRVM<sup>2</sup>. However more recently the Anglophone markets of Ghana and Nigeria have developed an increasingly regional orientation through the attraction of primary listings of firms in neighbouring countries. Consequently we ask whether stock exchanges adopting a strong regional focus can provide effective liquidity to firms listing from more distant outlying regions or nations within an integrated framework.

The nascent literature on implications of regional capital markets in acting as a source of sustainable finance and liquidity to firms from more distant regions in a centralised marketplace is centred in three distinct strands. The first is rooted in economic geography literature where Klagge and Martin (2005) introduce notions of a lack of spatial-neutrality which is particularly prevalent in centralised capital markets leading to a funding gap and rationing of both credit and equity to firms located in more distant provinces. The second

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<sup>1</sup> The Francophone West African Economic and Monetary Union (also known Union Monétaire et Économique de l'Afrique de l'Ouest (UMEAO)) countries include Cote d'Ivoire, Benin, Togo, Burkina Faso, Mali, Niger, Senegal and Guinea-Bissau

<sup>2</sup> La Bourse Régionale des Valeurs Mobilières (BRVM) is a regional stock exchange established in 1998 in place of the former national Bourse d'Abidjan and is based in Abidjan, Cote d'Ivoire. Antennae de bourse offices have been established in capital cities of all eight UMEAO member states to assist in technical aspects of trading and promoting centralised market while a separate network of Societe de Gestion et d'Intermédiation (SGI) or licensed brokers precipitates order flow

focuses on the study by Loughran and Schulz (2005) contrasting liquidity of urban as opposed to rural based firms within largely centralised capital market of United States. The findings attribute the significantly higher liquidity of urban stocks over their rural counterparts through greater familiarity of urban stocks to institutional investors that are predominantly urban-based as well as their enhanced information access to urban-based firms. The third and final strand of literature relates to informational access differentials between local as opposed to foreign analysts. Bae et al (2008) find evidence from study of local and foreign analysts across 32 countries that the former produce more accurate earnings forecasts and that locally-based analysts are especially important in institutionally deficient environments where there is less disclosure and greater earnings smoothing. Consequently our first theoretically based contribution to literature is in undertaking a unique assessment of the impact of regional primary listings in terms of their liquidity-based transactions costs which captures the dynamics of informational asymmetry.

West Africa's formal business environment is largely dominated by listed firms made up from former state owned enterprises (SOEs) as well as locally incorporated subsidiaries of foreign (mostly European) multinational enterprises (MNEs). However a unique nuance of the region is the recent emergence of local indigenous emerging MNE firms such as the Moroccan-Malian Bank of Africa and Togolese Ecobank. These have engaged in rapid expansions across Africa and Middle East through the very recently reported phenomenon of south-south foreign direct investment (FDI) (see Sun et al (2010) and Liu et al (2011) for discussions on south-south FDI emanating from India and China respectively) while the external funding and regulatory capital requirements of their subsidiaries is reliant on primary and joint-primary listings across West Africa's nascent stock markets. As such our study provides a unique insight into the informational asymmetries present across integrated regional markets such as BRVM as well as regionally focussed markets such as Ghana and Nigeria that underscore liquidity-based transactions costs incurred by large well known firms

from distant outlying regions on centralized exchanges. This is particularly pertinent in the case of Togolese Ecobank with unique joint-primary listing between BRVM, Ghana and Nigeria where all have common composition of senior management and boards of directors as well as the Burkina Faso, Niger and Benin subsidiaries of Bank of Africa.

The literature regarding liquidity within Africa's capital markets primarily focusses on the attribution of pricing premiums to liquidity in size and liquidity factor augmented variations of the capital asset pricing model. Hearn and Piesse (2009) find evidence of size and liquidity premiums across a broad sample of African listed industrial sectors while Hearn et al (2010) find similar evidence from a smaller sample comprised of Egypt, Morocco, Kenya and South Africa. Finally Hearn and Piesse (2010) find evidence of both size and liquidity in stock pricing across a sample of West African markets alongside Tunisia, Morocco, UK and France while the time-varying nature of liquidity coefficient betas have been explored across Africa including BRVM and Nigeria by Hearn (2012). More recently Hearn and Piesse (2013) undertake a unique study across Sub Saharan African (SSA) region comparing the robustness of three low frequency liquidity measures in explaining total trading costs measure, formed from combination of bid-ask spread and brokerage commissions associated with a round trip (respective buy and sell legs) trade. This included BRVM, Ghana and Nigeria alongside a further nine SSA equity markets and found that Lesmond, Ogden and Trzcinska (1999), henceforth LOT, proportion of daily zero returns indicator and to a lesser extent the multidimensional liquidity measure introduced by Liu (2006) are closely associated with total trading costs. The Hearn and Piesse (2013) study also introduced a unique series of controls to account for the impact on liquidity and transactions costs arising from the involvement of state, foreign partners, retained entrepreneurial founders, domestic and foreign venture capitalists within focal firm's organizational structure and ownership and finally whether firm is part of an extended family network or business group. Consequently the second contribution to the literature from our study is in the study of the contrasting impact of

regional listings on liquidity within a unique regional equity market setting of BRVM as well as Ghana and Nigeria in West African developing region.

Our maintained hypothesis is that liquidity-based transactions costs are higher for firms in outlying regions listing on a centralised stock exchange. However we also find evidence of a contrasting impact on liquidity related to the degree of economic and financial integration of the region and the location of the central stock exchange. We also find that firm's association with an extended family network or business group infers higher liquidity while involvement of state, foreign partner and foreign venture capitalists generally infer lower liquidity.

We proceed as follows: the next section reviews theoretical antecedents behind principal low-frequency liquidity measures and outlines their construction. It also outlines the literature behind regional markets as well as the firm governance and market controls alongside a newly introduced control accounting for impact of civil war on liquidity and transactions costs. Section 3 outlines data, sample construction and details the West African business and institutional environment while section 4 details empirical methods. Section 5 discusses results and the final section concludes.

## **2. The regional and governance Determinants of Liquidity**

### **2.1. Dependent variables: Liquidity benchmarks**

There has been considerable evolution in liquidity measures during the last decade although one measure, the bid-ask spread (Jain, 2002), is generally used in literature as a low-frequency liquidity benchmark. However a serious limitation arises when closing prices deviate from the official bid and ask price quotes given that trades take place at different prices or even outside the quotes (Lesmond, 2005). This is a particularly important issue in markets in West Africa, such as in Ghana where pre-agreed details are often registered in trading sessions following transactions undertaken outside of the formal exchange (Akotey, 2009). More

recently evidence from Hearn and Piesse (2013) reveals that there are significant issues regarding the wholesale lack of definition of certain measures in the presence of severe illiquidity across Africa's emerging and frontier markets. In particular Amihud (2002) price impact and ubiquitous turnover measures are routinely undefined across African markets and thus have been omitted from our study despite their prevalence in the literature that focusses on large developed markets such as US. Consequently we use three principal liquidity measures as our dependent variables in assessing liquidity-based transactions costs: the bid-ask spread, the multidimensional Liu indicator, and LOT (1999) proportion of zero returns.

### 2.1.1. The bid ask spread

The bid-ask spread is the average of the available monthly quotes with a minimum of a single month's quote for that month and the average used for the spread, which minimizes outliers that result from monthly sampling. Finally, following Lesmond (2005) negative bid-ask spreads and those that exceed 80% are removed. The monthly quoted spread is defined as:

$$\text{Quoted spread}_M = 1/2 \left[ \left( \frac{\text{Ask}_M - \text{Bid}_M}{(\text{Ask}_M + \text{Bid}_M)/2} \right) + \left( \frac{\text{Ask}_{M-1} - \text{Bid}_{M-1}}{(\text{Ask}_{M-1} + \text{Bid}_{M-1})/2} \right) \right] \quad (1)$$

### 2.1.2. LOT (1999) Proportion of zero daily returns measure

The proportion of daily zero returns over a period of the total number of trading days in a month is based on the measure introduced by Lesmond, Ogden and Trzcinka (1999), or LOT (1999). It is calculated on a stock-by-stock basis using:

$$\frac{1}{D_M} \sum_{D=1}^n (\text{ZeroDaily Return}) \quad (2)$$

where  $D_M$  is the number of days in the month, M.

### 2.1.3. Liu (2006) measure

This follows Liu (2006) and is defined as  $LM_x$  which is the standardized turnover-adjusted number of zero daily trading volumes over the prior  $x$  months ( $x = 1, 6, 12$ ), that is:

$$LM_x = (\text{Number of daily volumes in prior } x \text{ - months}) + \left( \frac{1/x \text{ month turnover}}{\text{Deflator}} \right) \times (21x/\text{NoTD}) \quad (3)$$

where  $x\_month\_turnover$  is the turnover over the prior  $x$  months, calculated as the sum of the daily turnover over the prior  $x$  months, daily turnover is the ratio of the number of shares traded on a day to the number of shares outstanding at the end of the day, NoTD is the total number of trading days in the market over the prior  $x$  months, and Deflator is chosen such that,

$$0 < \frac{1/x \text{ month turnover}}{\text{Deflator}} < 1 \quad (4)$$

for all sample stocks<sup>3</sup>. Given the turnover adjustment (the second term in brackets in (3)), two stocks with the same integer number of zero daily trading volumes can be distinguished: the one with the larger turnover is more liquid. Thus the turnover adjustment acts as a tie-breaker when sorting stocks based on the number of zero daily trading volumes over the prior  $x$  months. Because the number of trading days can vary from 15 to 23, multiplication by the factor  $(21x/\text{NoTD})$  standardizes the number of trading days in a month to 21, which makes the liquidity measure comparable over time.  $LM_1$  can be interpreted as the turnover-adjusted number of zero daily trading volumes over the prior month. The liquidity measure,  $LM_x$  is calculated at the end of each month for each individual stock based on daily data.

## 2.2 West African regional market variables

The literature relating to the differential impact between local as opposed to foreign (or more distant regional) firms and their respective analyst coverage alludes to elevated ownership in firms by mutual fund managers and investors that are local to them (Ivkovic and Weisbenner (2005) and Coval and Moskowitz (1999) and Frieder and Subrahanyam (2005)). In line with

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<sup>3</sup> Following Liu (2006) a deflator of 11,000 is used in constructing estimates for  $LM_1$



this evidence regarding home bias in ownership, Loughran and Schultz (2004) find similar evidence relating to trading concentration in local stocks. Two principal explanations have been put forward by literature to explain bias in ownership and trading activity towards stocks and firms local to mutual fund managers and investors.

The first relates to an informational advantage of local analysts and investors. Malloy (2004) finds analysts local to firms provide more accurate earnings forecasts which is particularly prevalent for firms located in remote areas, as well as those of smaller size and with higher accounting book value to market value ratios. Loughran and Schultz (2005) argue that more distantly located analysts are at a distinct disadvantage to their local counterparts owing to travel times and a lack of familiarity with nuances of local environment. These issues in effect amount to a form of transactions costs in terms of search and verification costs encountered by non-local analysts. Bae et al (2008) similarly find that local analysts are at a distinct advantage in information production in contrast to their foreign counterparts across a sample of 32 countries. However their advantage is especially significant in countries where smoothing of earnings is more commonplace and there is greater paucity in disclosure.

The second explanation relates to familiarity. Using US sample sets Barber and Odean (2003) and Huberman (2001) all find consistent evidence of local biases in stock ownership and trading activity caused by enhanced exposure and familiarity with awareness. However Grullon et al (2004) extend these findings with evidence that local familiarity biases can be overcome through increased advertising and brand awareness campaigns by more distantly located companies. Frieder and Subrahanyam (2005) find evidence that individual investors disproportionately hold firms with greater brand visibility. This is particularly pertinent in West African context given the negligible institutional investor participation within the regions markets with indigenous investment communities being primarily composed of local finance houses and individual investors from either wealthy social elites or

overseas diaspora (see Hearn and Piesse (2010) for discussion of Malian investment community).

To date, only three markets in Africa have successfully adopted integrated trading platforms: Egypt between Cairo and Alexandria (Hearn, 2011), South Africa and Namibia (Hearn and Piesse (2012a, b) and the West African Francophone regional bourse (BRVM) located in Cote d'Ivoire (Hearn and Piesse, 2010). All three have shared macroeconomic and governance arrangements through membership of various currency unions. However capitalization and traded value on the regional BRVM has largely been dominated by a single stock, namely the Senegalese telecommunications operator, Sonatel, since inception in 1998 (Hearn and Piesse, 2010). More recently however the exchange has undergone a drive to increase its regional focus through the attraction of Bank of Africa Benin and Niger entities in 2002 and 2003, Onatel, the Burkina Faso telecommunications operator in 2009, and Bank of Africa Burkina Faso entity in 2010 (Hearn, 2010, 2012a, b). Generally there are far fewer regional foreign primary listings on the Ghanaian and Nigerian exchanges. However the attraction of The Gambia's Trust Bank entity to the Ghanaian market in 2006 is a notable exception alongside the joint-triple primary listing of Togolese Ecobank between BRVM, Ghana and Nigeria in 2007 (Hearn, 2012a,b). Overall this evidence indicates that the regional attraction of listings is growing in importance for the Anglophone West African stock exchanges of Ghana and Nigeria while it is underscored by considerable political impetus as well as advanced level of monetary and economic integration in Francophone UMEAO region in case of BRVM. However given the significance of evidence relating to local biases in ownership and trading activity as well as locally induced informational asymmetries we hypothesize that liquidity-based transactions costs should be positively related with more geographically distant regions. Thus we would expect firms from more distant regions and nations to be positively associated with increased asymmetric information and illiquidity.

## 2.3 Control variables

### 2.3.1. Firm governance controls

Following the recent study of Hearn and Piesse (2013) we use a series of dummy (1/0) controls to account for distinctive types of ownership and governance arrangements. These are the involvement of state or related government agencies, a long-term foreign partner, the maintained presence of an entrepreneur-founder on the board, the involvement of domestic or foreign venture capital and finally whether firm is affiliated to the extended network of family or business group. The employment of dummy controls mitigates concerns over potential endogeneity relationship between level of actual ownership by various entities and liquidity or spreads. Equally their employment is necessitated by often erratic availability of annual reports (see African Financials (2012)) as well as considerable variation in the quality of reporting ownership across national regulatory regimes (Hearn, 2013).

In particular motivation for the use of state and long-term foreign partner governance dummy controls arises from phased privatization which is especially common across West African region where it is notable that a particular peculiarity associated with nation states that are members of both Francophone UMEAO and CEMAC<sup>4</sup> economic and monetary unions is the dirigiste (state-led) capitalist model of development (Lavelle (2001); Hearn (2013)). This when combined with civil code legal, political and governance systems that promote central authority of state and executive are also more commonly associated with full divestment of state ownership to a strategic foreign partner (Hearn; 2012, 2013) which is more prevalent in privatizations in civil code as opposed to common law markets. This difference between civil and common law markets, largely underscored by the dirigiste economic model, has also been attributed to the general lack of entrepreneurial firms in

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<sup>4</sup> La Communauté Économique et Monétaire de l'Afrique Centrale (CEMAC) is the second continental Franc-zone which is centred in central Africa and includes Cameroon, Central African Republic, Chad, Republic of the Congo, Equatorial Guinea, and Gabon. Two stock exchanges serve this community: in Douala, Cameroon and Libreville, Gabon. The attraction of listings has been a major issue for both exchanges with the Cameroonian bourse failing to attract any listings for first three years of its establishment while the Gabon-based exchange still lacks any listed firms or instruments

listings in the stock markets in civil code law markets (Bennell, 1997). Hearn and Piesse (2013) also find little involvement of entrepreneur-founders in listed firms across SSA region although their presence does impart a significant impact on liquidity. Hearn and Piesse (2013) also find considerable evidence of the pervasive presence of extended informal business groups and family networks. Figure 1 exemplifies the complexity of tracing extended family and business networks with the example of the Bank of Africa business group which is ultimately owned by Moroccan BMCE bank, itself owned by Benjelloun family.

### **Figure 1**

#### *2.3.2. Institutional Controls: Impact of civil war in Cote d'Ivoire*

Schneider and Troeger (2006) highlight that while there is a considerable literature on the economic causes and consequences of armed conflicts and war, relatively little is known about the actual costs of war and conflict. Few, if any studies have focussed on the impact of domestic conflict, or civil war, on domestic capital markets.

#### *2.3.3. Market Controls*

The principal controls in liquidity based models are centred on notion of liquidity being reflective of the price for immediacy in trading demanded by active traders to passive market maker entities that face order processing and inventory risks. As such Stoll (2000) outlines market controls of stock price, return volatility or variance, traded volume and market capitalization. Price controls for discreteness and acts as an additional proxy for risk as low stocks tend to be riskier while increases in volume, number of trades and firm size (market capitalization) all increase the probability of locating a counterparty and thus are associated with reducing inventory risk. Additionally the stocks return variance measures the risk of adverse price changes on stocks placed in inventory.

### **3. Data**

#### 3.1 Data and sample selection

In order to estimate our liquidity benchmark, the bid-ask spread plus brokerage commissions we procure the end of day bid and ask quotes for Nigeria from Bloomberg while those for BRVM and Ghana are obtained direct from national stock exchanges. It is notable in the case of BRVM that bid and ask prices are only disseminated in daily trading reports and through no other means. As such these must be systematically collected, compiled and formed into a database prior to any further work. Equally the bid and ask prices are effective (not quoted) in the light that the BRVM operates a call auction trading system and quoted spreads do not drive the market. Historical time series bid and ask quotes are unavailable from Cape Verde exchange. In all cases sample data ends in June 2012, while there is a considerable difference in historical availability of data and thus the starting date varies. For BRVM (Cote d'Ivoire) from September 1998; for Ghana from July 2007 and for Nigeria from October 2009.

The computation of our individual liquidity estimators involved obtaining daily closing stock price data in local currency form from: Bloomberg for Nigeria and Ghana; and national stock exchanges in case of BRVM and Cape Verde Islands. Local stock prices are used in estimation of LOT (1999) daily zero returns. Finally in order to compute turnover, Amihud and Liu measures, daily trading volume and total numbers of shares outstanding data were sourced from Bloomberg and national stock exchanges. It should be noted that the shares-outstanding is determined at the start of the year and remains constant for the 12 months thereafter.

The primary source of firm governance and ownership characteristics in the first instance was the African Financials website (African Financials, 2012) in the light of patchy coverage at best of West African region in databases such as Bloomberg and Datastream. African Financials provides a dissemination service of annual reports and stock exchange filings for a relatively comprehensive sample of markets across Sub Saharan African and

West African regions although a notable exception is the BRVM. However in many cases the database is incomplete in its holdings of annual reports for individual listed firms and in these cases individual firm websites in conjunction with regulatory authorities and national stock exchanges were used to additionally supplement data. A further limitation is the opacity in reporting accurate ownership in annual reports, with this being attributed to general nominee accounts or omitted altogether. This both necessitated the consultation of additional sources as well as the employment of simple dummy variable (1/0) in representing involvement of six various corporate and state entities in listed firm's ownership and organizational structure as opposed to reporting share ownership levels. This is very similar to the firm governance constructs developed and used in Hearn and Piesse (2013) across the wider Sub Saharan African region.

The regional listings dummy variables (1/0) are formed from whether listed firm's head office and operations are based in another country within the wider West African region. This is particularly pertinent in case of BRVM where exchange itself was established to serve member states across the wider predominantly Francophone UMEAO economic and monetary union. Notable regional equity listings on BRVM are from Senegal, Burkina Faso, Niger and Benin while the Togolese MNE conglomerate of Ecobank is notable in its joint-primary listing across BRVM, Ghanaian and Nigerian exchanges. Gambia's Trust Bank is the only other notable regional listing to have been undertaken on the Anglophone Ghanaian exchange.

Finally we introduce a dummy (1/0) variable to account for the period of civil war in Cote d'Ivoire which is from the point of disputed elections in December 2010 to the termination of formal hostilities in May 2011. It is especially important to use a dummy rather than simple political risk measures as the BRVM was temporarily relocated to the

relative stability of Bamako, Mali for much of this period where limited trading and operations continued<sup>5</sup>.

### 3.2. West African business and governance environment

A significant feature of the West African region is a general paucity in institutional quality inhibiting external contracting. This is exemplified in Appendix Table 1 where the evidence reveals substantial deficiencies in codified corporate law as well as in corporate governance legislation and bodies that in combination exert a substantial impact on the quality of information production. In particular the slow ratification of legal codes and statutes through parliament in Sierra Leone and Cape Verde infers a whole sale lack of protection of minority investors. Further complications exist with bifurcated accounting and auditing systems within Nigeria where local accounting standards are used alongside their internationally recognized equivalent while only 40% of all Nigerian firms were deemed to have adopted any corporate governance measures in 2006 (CBN, 2006). The regions stock exchanges are generally very small and reinforced by an often embryonic community of licensed brokers with few, if any market makers as is the case in Sierra Leone, Cape Verde, Cameroon, and BRVM itself. Partly as a response to these deficiencies exchanges have resorted to the attraction of listings of corporate and government debt instruments, such as bonds and treasuries, in order to retain economic viability. This is exemplified by Cape Verdean exchange, with details outlined in Table 1, where firms are attracted to list debt through competitive tax breaks of up to 50% reduction in corporate taxation rates which has led to the capitalization of listed corporate debt being almost six times that of equity. However the evidence from Table 1 also reveals characteristics in the operation of the Cape Verdean exchange common to the wider West African region such as concentration of trading activity in small handfuls of stocks and very

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<sup>5</sup> BRVM operations were moved to Bamako, Mali in order to circumvent international sanctions placed on Cote d'Ivoire and specifically the former incumbent Gbagbo regime which caused many international banks to suspend or cede their operations owing to severity of foreign exchange controls. Furthermore the military occupation of BRVM premises by Gbagbo supporters forced the suspension of operations underscoring the need for temporary relocation to Mali

long order matching times that are occasionally as high as 24 days. This severity in absence of liquidity further underscores our choice of low frequency liquidity measures.

### **Table 1**

The evidence from Table 2 reveals characteristics of the West African business environment and governance arrangements. It is notable that extended family networks dominate listed firms in Nigeria. These alone account for over 42% of total exchange capitalization and over 28% of traded value. Equally extended family networks account for all listed capital and trading activity on embryonic Cameroonian exchange although this is based on large foreign (Luxembourg-based) family interests. Family interests account for minimal proportions of listed capitalization and traded value in Ghana and even less in BRVM, although in this latter market this is solely represented by the extended network of Bank of Africa (as outlined earlier in Figure 1). More generally state involvement is particularly high in the smaller markets of Cape Verde, Cameroon and Sierra Leone while foreign partner involvement is either non-existent or negligible between Sierra Leone and Nigeria yet highly prevalent in BRVM, Ghana and Cameroon. Entrepreneurial firms account for a minimal proportion of listings across the region with only 24.18% of firms in Nigeria and 13.64% of firms in Ghana respectively. This is equally reflective of a undercapitalized and almost non-existent entrepreneurial private sector in civil code law as opposed to common law countries across region (Bennell, 1997). Similarly there is almost non-existent participation of domestic venture capitalists in region with sole exception of their involvement in 4.95% of Nigerian listed firms. However in contrast there is a marked participatory involvement of foreign venture capitalists which is largely the result of private equity investment activity by international financial institutions such as IFC (US), CDC (UK) and Actis (UK). However it is notable that the foreign venture capitalist involvement in Cape Verdean bank, Caixa Económica de Cabo Verde, is through Geocapital, a Macau-based private equity venture



formed by Hong Kong and Macau property magnate Stanley Ho and Macanese-Portuguese Jorge Ferro Ribiero (Geocapital, 2013). This Chinese-backed venture aims to consolidate the provision of financial services across Portuguese-speaking countries world-wide thereby acting to facilitate trade with China (Geocapital, 2013).

## **Table 2**

A unique feature of the West African business environment is the emergence of two large indigenous banking MNE firms, Ecobank and Bank of Africa, engaging in rapid expansion across African emerging market region. Little, if any, literature exists on SSA south-south FDI underscoring the uniqueness of the expansion of both West African entities across the wider continent as detailed in Figure 2. However there are notable differences between these two rival conglomerates underscoring their expansion. In particular Ecobank has a more formalised structure based on that typical to a MNE while its rival Bank of Africa is structured more on an extended family or business network. Control across otherwise disparate entities across Africa is exerted through an elaborate system of cross-shareholdings between entities (see Figure 1) and directors have shared local directorships across separate individual group entities. Regionally distinct entities from both banking groups benefit from direct private equity involvement of PROPARCO (controlled by Agence Française de Développement), Netherlands development bank, FMO, and Belgian development finance entity, BIO. Access to private equity finance alongside the benefits arising from optimal coordinative power over resources attributed to membership of extended business group have enabled both banking groups to engage in rapid recent expansions across the African continent as is evidence from Figure 2.

## **Figure 2**

### **4. Empirical Methods**

In order to examine the relationship between our three designated liquidity measures, namely the bid-ask spread, multidimensional Liu (2006) indicator and LOT (1999) proportion of daily zero returns measure, and various dummy controls to account for firm governance, regional and civil war characteristics in addition to Stoll (2000) market controls we use pooled cross-sectional and time series data. We also use a series of industry dummy controls that account for potential variations of liquidity across industry sectors. These are based on Bloomberg industry definitions and vary in absolute number depending on how many industries are represented in the smaller West African markets. Following Lesmond (2005), Chung et al (2010) and Hearn and Piesse (2013) we use OLS regressions while owing to persistence in liquidity measures over time (see Agarwal (2011) for extended discussion) we have estimated the standard errors by clustering them on time dimensions using White cross section robust standard errors and covariances method. This ensures that inference, based on standard errors, is robust to correlation across residuals within a firm over time<sup>6</sup>.

## **5. Results and discussion**

### **5.1 Descriptive statistics**

The evidence from Table 3 reveals characteristics of West Africa's equity markets and their regional focus as well as providing motivation for sample selection for inclusion in empirical modelling. There are some notable observations from descriptive statistics in Table 3. The first is the relative inactivity and extremely high levels of illiquidity across all West African equity markets. This is exemplified in proportions of daily zero returns in excess of 90% for both the BRVM and the Ghanaian market while this ratio of inactivity ascends to over 93% for the smaller markets of Cameroon, Cape Verde and Sierra Leone. Generally bid-ask spreads are reflective of this level of inactivity in being in excess of 14% in Ghana to over 6% in BRVM where bid and ask prices are representative in the light that trading system is a call

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<sup>6</sup> White cross section robust standard errors and covariances method has been used in all estimations to account for period clustering over time for either firms or countries/markets

auction. However the very low bid-ask spreads in Nigeria alongside very high proportion of daily zero returns measure (over 80% across Nigerian market) infers that significant caution should be taken in interpreting bid-ask spread metrics in this market. More generally and the very small sample size and lack of time series underscores the omission from further study of Cameroon and Sierra Leone. Similarly the lack of bid-ask spread data from Cape Verde underscores the omission from further study of determinants of this particular liquidity measure. Consequently our final study is focussed on markets of Nigeria, BRVM, Ghana and then Cape Verde, though we only consider Liu and LOT zero returns measures in this latter market. Finally there is significant evidence of considerable variation in liquidity across primary listed firms from outlying regions – both in BRVM as well as in Ghana and Nigeria. The evidence from Table 3 suggests that almost all trading activity in Ecobank within the Ghanaian market is concentrated on the locally registered affiliate, Ecobank (Ghana), with minimal activity in the parent holding entity, ETI. In contrast the ETI parent holding entity has considerable trading activity in Nigeria with traded volume in ETI being almost one and a half times that of the market average. This is likely reflective both of increased awareness of Ecobank brand alongside the impact of Ecobank’s recent acquisition of local Nigerian banking entity, Oceanic Bank thereby further increasing its market share and brand impact in Nigeria. Finally there are marked differences between regional primary listed entities from across UMEAO nations on BRVM.

### **Table 3**

#### 5.2. Liquidity determinants in BRVM

The evidence from regression results in Table 4 reveals several differences in the relationships between bid-ask spread measure and its association with regional plus control variables on one hand and relationships between these and LOT proportion of zero returns and Liu indicators. In line with earlier evidence from descriptive statistics the coefficients of both

Niger (0.030) and Senegal (0.031) are large, positive and statistically significant at 99% confidence level in their association with bid-ask spread. Benin (0.020) and Burkina Faso (0.002) are lowest while a very large negative association (-0.111) that is also statistically significant at 99% confidence level exists between Togo and bid-ask spread.

In contrast the coefficients of association between each UMEAO regional nation and the two alternative measures of illiquidity, namely Liu and LOT proportion of zero returns indicators, are broadly similar. All coefficients against regional UMEAO nations for their association with Liu and LOT zero measures are large, positive and statistically significant in excess of 95% confidence margin. It is notable that the highest association between regional entity and both LOT zero and Liu measures is for Senegal (14.462 in LOT zero and 2.600 in Liu) and Burkina Faso (3.118 in LOT zero and 4.444 in Liu). Togo also has a positive association with both illiquidity measures (3.432 in LOT zero and 1.900 in Liu). This is the opposite of the association with illiquidity when using the bid-ask spread measure. However a likely explanation for this opposite relationship when using bid-ask spread as opposed to other LOT zero and Liu measures is that given bid and ask prices are posted for reference only (i.e. are not quoted and thus not driving the market) that investors are more likely to make bids and offers that are closer to true call auction determined value of Togolese stock (ETI) given the significant presence of Ecobank and ETI in Cote d'Ivoire. This in itself infers greater brand awareness and easier access to information thereby reducing informational asymmetries and hence posted bid-ask spreads. The only major difference in associations between UMEAO regional nations and LOT zero and Liu illiquidity measures is in the case of Benin and Niger. The relationship between Benin and LOT zero measure lacks statistical significance while Benin's association with Liu is large, negative and statistically significant at 99% confidence margin. This would imply that using the multidimensional trading speed measure of Liu (2006) primary listed firms with headquarters in Benin are associated with lower illiquidity. This may be explained by the substantial presence of Bank of Africa group

entities in Cotonou, Benin with a listed Bank of Africa affiliate but also with the headquarters of Actibourse and ATTICA, the investment banking and private equity arms of Bank of Africa group that are also active in Cote d'Ivoire. This would imply a significant degree of financial integration between Benin and local investment community in Abidjan, Cote d'Ivoire where BRVM is located. Finally the large, positive and statistically significant association between Niger (-2.895) and LOT zero measure is in contrast to both bid-ask spread and Liu measures. This relationship is unexpected and somewhat harder to explain but one plausible explanation would relate to the sole Nigerien listing being the local affiliate of Bank of Africa group which is a highly visible brand across UMEAO countries and therefore subject to high investor awareness and therefore decreased illiquidity.

In terms of the controls and the coefficient of association between civil war dummy and bid-ask spread is negative (-0.012) and statistically significant at 99% confidence level while it is positive and statistically significantly associated with LOT zero (+1.547) and Liu (+0.283) measures. The most likely explanation for this visibly different association between bid-ask spread and other measures is similar to the above explanation for similar difference in signs attributed to Togo regional entity. During the civil war and when BRVM was temporarily relocated in relative stability of Bamako, Mali any bid and offer prices to market are more likely to reflect true call-auction determined value of stocks. However this explanation is only valid given the bid and ask prices are representative and not quoted. Finally all other firm governance controls have the expected size and direction of coefficients of association and are in line with literature (Hearn and Piesse, 2013). As such the involvement of state, foreign partners and foreign venture capitalists are all positively associated with illiquidity while firms that are part of extended business group networks are negatively associated with illiquidity. In line with Stoll (2000) as well as Lesmond (2005) and Hearn and Piesse (2013) stock price, volatility, traded volume and size (market capitalization) are all negatively associated with illiquidity.

## Table 4

### 5.3. Liquidity determinants in Ghana, Nigeria and Cape Verde

The evidence regarding the attraction of primary listed firms from other West African nations to Ghanaian and Nigerian exchanges is provided in Table 5. While there are some differences in direction of coefficient of association between Togo (sole primary listed entity of ETI or Ecobank) and all three illiquidity measures generally the association is negative. This generally negative association is likely explained in terms of brand awareness (familiarity of local investors with brand) and relative financial integration with Ecobank having sizeable presence in Ghana through its local affiliate, Ecobank (Ghana), and in Nigeria through its acquisition and re-branding of Nigeria's Oceanic bank. It is notable that the questionable accuracy of bid-ask data from Nigeria is further reflected in extremely low explanatory power of empirical model with bid-ask spread as dependent variable (an adjusted  $R^2$  of a meagre 9%).

More generally across the firm governance controls and foreign partner, retained presence of entrepreneurial founder, involvement within extended family network or business group and participation of foreign venture capitalist are all associated with lower illiquidity in both Ghana and Nigeria. In contrast state participation is associated with lower illiquidity in Ghana and the opposite effect in Nigeria while there is some discrepancy in this latter market over the impact on either LOT zero or Liu illiquidity measures by domestic venture capitalists. In particular domestic venture capitalists are associated with higher illiquidity using LOT zero measure and the opposite effect when using Liu indicator. It is notable that in direct contrast to the evidence of association between foreign venture capitalist participation in firms and illiquidity in both Nigeria and Ghana, the association in Cape Verde is large, positive and statistically significant. This would infer that the presence of Geocapital private equity entity is associated with increased informational asymmetry and thus illiquidity.

Finally all Stoll defined market controls have relationships with illiquidity measures as anticipated in literature (Lesmond (2005) and Hearn and Piesse (2013)). As such stock price, volatility, traded volume and size (market capitalization) are all negatively associated with illiquidity. The only exception is in Cape Verde where size has a positive association with LOT zero (0.173) and Liu (0.520) measures. This would infer that larger firms are more opaque and have greater informational asymmetry in Cape Verde which is harder to explain and may be a nuance of a very small and extremely inactive market.

### **Table 5**

## **6. Conclusions**

This study uses three low-frequency liquidity estimators, namely the bid-ask spread, LOT (1999) proportion of daily zero returns and multidimensional Liu (2006) indicator, to assess the impact on liquidity-based transactions costs arising from the attraction of primary listings on centralized stock exchange from more distant regions and nations.

We find substantial support that the attraction of foreign or more distant regional primary listings is associated with increased illiquidity of firms from these more distant outlying regions. However this increase in illiquidity is mitigated to a certain extent by increased brand awareness of those firms with primary listing on central market. We also find substantial support that the impact of civil war on asymmetric information is considerable and reflected in elevated illiquidity. These findings have the potential to better inform policy debates on the creation of integrated or regional stock exchanges in developing regions such as Africa where a significant shortcoming is the considerable differential in liquidity-based transactions costs arising from listings from more distant regions.

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**Table 1. Micro-market characteristics: Cape Verde Islands Stock Exchange, 2012**

Panel 1: Equities	Date Listed/ Maturity	M. Cap.	Free Float	Total consummated buy orders		Total consummated sell orders		Mean Order matching time
		US\$m	%	US\$m	N	US\$m	N	Days
Banco Comercial do Atlântico	12/2005	11.49	52.82	0.09	17	0.07	12	4.68
Caixa Económica de Cabo Verde	12/2005	4.00	90.00	0.13	4	0.13	4	0.73
Empresa Nacional de Combustivo	03/2007	5.74	35.00	0.03	8	0.04	13	5.57
Sociedade Cabo-verdiana de Tabacos	11/2005	2.76	36.00	0.08	7	0.08	5	1.81
<b>Total:</b>		23.99		0.32		0.31		
<b>Panel 2: Corporate Bonds</b>								
ASA (Empresa Nacional de Aeroportos e Segurança Aérea)	08/2007 – 08/2012	6.89	---	0.00	0	0.00	0	---
Banco Africano de Investimentos Cabo Verde (Angola)	12/2011 – 12/2016		---	2.23	2	2.23	2	24.54
Banco Comercial do Atlântico	05/2010 – 05/2017	5.74	---	0.87	2	0.82	1	2.00
Banco Interatlântico	07/2008 – 07/2014	5.74	---	0.00	0	0.03	1	---
Cape Verde Fast Ferry	08/2011 – 08/2015	17.23	---	19.40	4	18.37	3	0.93
Obrigações Elec A (Empresa Nacional de Electricidade e Agua)	06/2007 - 06/2012	13.12	---	0.00	0	0.00	0	---
Obrigações Elec B	06/2007 - 06/2017	13.10	---	0.44	1	0.44	1	0.00
Obrigações Elec VAR	06/2007 - 06/2027	26.08	---	203.15	1	203.15	1	0.00
Obrigações A Tecnícil (Sociedade de Imobiliária e Construções)	08/2007 - 08/2012	4.02	---	0.00	0	0.00	0	---
Obrigações B Tecnícil	08/2007 - 08/2012	2.29	---	0.00	0	0.00	0	---
Obrigações C Tecnícil	08/2007 - 08/2012	2.29	---	0.00	0	0.00	0	---
Obrigações D Tecnícil			---	148.49	4	148.40	4	0.00
Obrigações Tecnícil Industria	04/2009 - 04/2014	1.72	---	0.14	1	0.13	1	16.00
Obrigações IFHA Max (Investment Fund for Health in Africa)	01/2009 - 01/2014	4.83	---	0.00	0	0.00	0	---
Obrigações IFHA			---	0.00	0	0.00	0	---
SOGEI (Sociedade de Gestão de Investimentos)	02/2009 - 02/2014	17.24	---	1.89	1	1.89	1	0.00
<b>Total:</b>		120.29		376.64		375.47		
<b>Panel 3: Municipal (State) Bonds</b>								
Obrigações da Câmara Municipal Praia	06/2010 – 06/2030	5.17	---	0.00	0	0.00	0	---
Obrigações Câmara Municipal do Sal	06/2010 – 06/2025	2.29	---	0.00	0	0.00	0	---
<b>Total:</b>		7.46		0.00		0.00		
<b>Panel 4: Central Government Treasury Bonds</b>								
Total: 11 Treasury Bonds	Min: 11/2001 – Max: 09/2013	17.41	---					

Source: Compiled by author from Bolsa de Valores de Cabo Verde (Cape Verde stock exchange) website

Notes: N is absolute number of consummated/ matched orders

Data unavailable for trading history of central government treasury bonds from either stock exchange nor bourse website

**Table 2. West African business environment**

Average firm governance characteristics for all listed firms on every stock market in West Africa. The firm governance measures are dummy variables taking value 1 if condition is satisfied and 0 otherwise for involvement of state, foreign partner, owner-founder retained on board, whether firm is part of extended family group/ business network and whether participation of domestic as opposed to foreign venture capitalists (VC). Degree of family group/ business network influence throughout stock market measured as number of firms under control of group/network and proportions of total market capitalization (US\$m) and total traded value (US\$m) cumulatively attributable to top 1, top 2, top 5, top 10 and then all family groups/ business networks operating in national market. Data are from annual reports on AfricanFinancials (<http://www.africanfinancials.com>) or from websites of individual firms, stock exchanges and national regulatory authorities.

Panel 1	No. Family/ Business group firms	No. Family/ Business groups	Mkt. Cap. USD (m)	Proportion of total Mkt. Cap. per family/ business group (%)				
				Total	Top 1	Top 2	Top 5	Top 10
Nigeria	35	28	41,988.19	28.35	34.80	41.65	42.29	42.56
BVRM	0	0	4,740.47	1.89	---	---	---	---
Ghana	3	3	14,060.68	0.31	0.35	---	---	0.35
Cameroon	2	3	213.11	64.98	95.29	---	---	100.00
Cape Verde	1	1	100.28	45.31	---	---	---	45.31
Sierra Leone	0	0	19.08	---	---	---	---	---

Panel 2	Traded Value USD (m)	Proportion of total Traded value per family/ business group (%)				
		Total	Top 1	Top 2	Top 5	Top 10
Nigeria	1,952.86	14.21	23.94	28.21	28.45	28.49
BVRM	37.48	4.77	---	---	---	---
Ghana	22.56	16.17	16.71	---	---	16.72
Cameroon	0.97	88.56	97.85	---	---	100.00
Cape Verde	0.11	32.89	---	---	---	32.89
Sierra Leone	0.09	---	---	---	---	---

Panel 3	Proportions of listed firms with involvement of following entities (%)					
	State	Foreign Partner	Owner/ Founder	Family/ Bus. Group	VC Domestic	VC Foreign
Nigeria	7.14	24.18	24.18	23.08	4.95	2.75
BVRM	27.66	76.60	0.00	8.51	0.00	14.89
Ghana	20.45	52.27	13.64	6.82	0.00	2.27
Cameroon	66.67	66.67	0.00	100.00	0.00	0.00
Cape Verde	100.00	50.00	0.00	25.00	0.00	25.00
Sierra Leone	100.00	0.00	0.00	0.00	0.00	0.00

Notes: Compiled by authors from Bloomberg, Datastream and National stock exchanges

(1) US\$ Exchange rates from Bloomberg and Datastream

(2) Ghana prices denominated in (old) Ghanaian cedi. The new cedi was introduced on 1 January 2007 and is 1/10,000 value of (old) cedi

(3) Single largest family group in Cameroon is one foreign (Luxembourg-based) family.

**Table 3. West African equity market summary statistics**

Descriptive statistics for 20 SSA equity markets including the 12 that comprise the final sample. Start dates vary for each country while sample end dates are June 2012 across all markets. N is sample size. Price is the mean daily price for each month and converted to US\$ using the mean exchange rate for each month and country. Volume is the mean of the daily trading volume for each month in thousands. Market capitalization is of 1 January for each country and is equity market value for each firm in millions of local currency or US\$. The bid-ask spread is defined in Table 3. The monthly mean is for all stocks to obtain a market wide measure. The US\$ market capitalization is the end of month exchange rate for each country and month. Square parentheses indicate median values for each variable.

Market	Regional listed firm(s)	Sample Start	N	Local market			US\$ equivalent	
				Bid-Ask spread (%)	Zero Return (%)	Volume ('000)	Price	Mkt. Cap (m)
Cameroon	Overall	09/2011	3	Call Auction	93.84 [96.30]	0.46 [0.20]	144.33 [105.95]	65.53 [43.87]
Cape Verde Is.	Overall	12/2005	4	-- --	97.49 [98.39]	0.64 [0.15]	59.67 [66.76]	18.12 [19.08]
Sierra Leone	Overall	01/2009	1	-- --	98.92 [100.00]	3,603.03 [1,582.82]	0.001 [0.00]	20.95 [20.26]
Ghana	Overall	07/2007	42	14.23 [3.44]	91.79 [100.00]	661.90 [65.87]	3.05 [0.30]	370.82 [33.02]
	Gambia – Trust Bank	07/2007		0.00 [0.00]	99.86 [100.00]	0.85 [0.85]	1.19 [1.33]	35.80 [39.90]
	Togo - Ecobank	03/2008		1.82 [1.03]	68.51 [76.67]	172.88 [88.46]	3.12 [3.11]	510.17 [488.75]
	Togo - ETI	07/2007		13.43 [6.98]	87.76 [87.10]	0.01 [0.00]	0.44 [0.16]	598.29 [209.01]
Nigeria	Overall	10/2009	201	1.80 [0.90]	81.61 [96.72]	45,285.59 [5,268.14]	0.28 [0.02]	213.52 [18.65]
	Togo - ETI	10/2009		1.78 [1.78]	50.54 [46.67]	73,387.85 [57,479.45]	0.09 [0.10]	938.32 [979.34]
BRVM	Overall	09/1998	47	6.67 [3.23]	90.48 [95.46]	24.00 [0.32]	50.37 [23.59]	74.12 [15.56]
	Senegal – Sonatel	11/1998		4.54 [3.64]	67.66 [67.96]	23.69 [13.80]	152.69 [94.99]	1,526.93 [949.93]
	Burkina Faso – Onatel	05/2009		0.56 [0.00]	89.36 [93.33]	1.06 [0.69]	96.40 [100.06]	327.77 [340.23]
	Burkina Faso – Bank of Africa	01/2011		0.49 [0.28]	84.89 [86.67]	3.18 [0.83]	68.90 [70.18]	48.23 [49.12]
	Niger – Bank of Africa	12/2003		3.35 [3.17]	92.08 [96.16]	0.66 [0.26]	60.63 [59.87]	11.82 [11.67]
	Benin – Bank of Africa	11/2000		1.96 [1.13]	88.14 [90.91]	1.29 [0.76]	77.63 [74.85]	50.19 [52.02]
	Cote d'Ivoire – Bank of Africa*	06/2010		0.83 [0.83]	86.80 [90.00]	2.48 [1.03]	59.43 [59.12]	35.66 [35.47]
	Togo – ETI	09/2006		1.84 [1.68]	66.46 [66.67]	1,592.49 [1,137.44]	0.55 [0.11]	92.40 [23.33]

Source: Compiled by authors from Bloomberg, Datastream and National stock exchanges

Notes: (1) US\$ Exchange rates from Bloomberg and Datastream

(2) Ghana prices denominated in (old) Ghanaian cedi. The new cedi was introduced on 1 January 2007 and is 1/10,000 value of (old) cedi

(3) \*indicates Ivorian Bank of Africa is present for comparison purposes against other regional Bank of Africa listings

(4) ETI refers to Ecobank Transnational Industries, the parent MNE entity of locally headquartered Ecobank entities

**Table 4 Results of regressions of total costs on liquidity proxies and measures for BRVM regional market**

Regressions are on a firm-monthly basis. Three liquidity measurement variables are presented. Liu (2006) , turnover is a ratio of the traded volume of shares in relation to total number of shares outstanding and is scaled by the number of trading days in the month of measurement. It provides a measure of trading frequency. The final measure is the Bid Ask spread which is the average daily relative bid ask spread over the prior 1 month, where daily relative spread is the local currency denominated spread divided by average of Bid and Ask prices. Firm size is determined from the first day of each month. Volatility is the average daily stock return variance and price and volume measure the average price (local currency units) and trading volume over an annual trading period. Turnover, price, volume, and market capitalisation are all log scaled in line with Stoll (2000). N is the sample size in firm months. The White cross-section t-statistics are in parentheses.

Dependent Variable:	<b>BRVM (N = 3,643)</b>					
	Bid-Ask spread (%)		Zero (%)		Liu	
	Aggregate	Specific	Aggregate	Specific	Aggregate	Specific
Intercept	0.252 [8.57] †	0.244 [8.29] †	144.048 [49.25] †	146.469 [48.31] †	28.825 [20.86] †	27.276 [20.98] †
<b>Regional Listings</b>						
Aggregate	-0.077 [-8.04] †	---	1.829 [0.86]	---	1.445 [1.99] **	---
Senegal		0.031 [6.42] †		14.462 [5.62] †		2.600 [2.90] †
Benin		0.020 [8.86] †		1.051 [0.77]		-3.022 [-8.76] †
Niger		0.030 [4.84] †		-2.895 [-2.33] †		1.729 [4.03] †
Burkina Faso		0.002 [1.60]*		3.118 [5.68] †		4.444 [5.72] †
Togo		-0.111 [-9.98] †		3.432 [1.28]*		1.900 [1.85]**
Gambia	---	---	---	---	---	---
<b>Institutional Control</b>						
Civil War	-0.012 [-3.89] †	-0.010 [-3.30] †	1.245 [4.13] †	1.547 [4.91] †	0.244 [0.88]	0.283 [1.01]
<b>Governance Controls</b>						
State	0.041 [7.03] †	0.038 [6.81] †	-0.106 [-0.21]	0.124 [0.26]	0.630 [1.91]**	0.624 [1.87]**
Foreign Partner	0.027 [7.21] †	0.027 [7.20] †	0.456 [1.16]	0.510 [1.30]*	0.831 [3.27] †	0.798 [3.12] †
Founder	---	---	---	---	---	---
Family/ Bus. Group	0.055 [5.81] †	-0.045 [-8.76] †	-2.253 [-1.01]	-0.353 [-0.32]	-9.071 [-10.61] †	-6.535 [-14.96] †
Domestic VC	---	---	---	---	---	---
Foreign VC	-0.013 [-2.43] †	-0.008 [-1.55]*	3.012 [4.35] †	2.972 [4.39] †	1.052 [3.07] †	0.900 [2.70] †
<b>Market Controls</b>						
Price	-0.015 [-9.06] †	-0.017 [-9.77] †	-0.482 [-2.24]**	-0.339 [-1.42]*	-1.610 [-11.30] †	-1.578 [-11.81] †
Volatility	-0.012 [-0.59]	-0.014 [-0.76]	-42.039 [-1.42]*	-42.063 [-1.43]*	-1.063 [-1.19]	-1.063 [-1.17]
Volume	-0.0003 [-0.30]	3.58E-05 [0.04]	-2.516 [-26.10] †	-2.605 [-26.08] †	-2.602 [-13.81] †	-2.565 [-13.32] †
Size	-0.004 [-2.26] **	-0.003 [-1.53]*	-1.640 [-12.00] †	-1.796 [-11.93] †	0.789 [5.77] †	0.836 [6.55] †
Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
F-stat (p)	27.73 [0.00]	24.00 [0.00]	127.72 [0.00]	105.90 [0.00]	202.71 [0.00]	169.13 [0.00]
Adj-R <sup>2</sup> (%)	0.1109	0.1171	0.3717	0.3769	0.4849	0.4922

Notes: (1) \* p > 90% level; \*\* p > 95% level; † p > 99% level

(2) White cross section robust standard errors and covariances (d.f. corrected) (period clustering)

**Table 5 Results of regressions of total costs on liquidity proxies and measures for West Africa (excluding BRVM)**

Regressions are on a firm-monthly basis. Three liquidity measurement variables are presented. Liu (2006), turnover is a ratio of the traded volume of shares in relation to total number of shares outstanding and is scaled by the number of trading days in the month of measurement. It provides a measure of trading frequency. The final measure is the Bid Ask spread which is the average daily relative bid ask spread over the prior 1 month, where daily relative spread is the local currency denominated spread divided by average of Bid and Ask prices. Firm size is determined from the first day of each month. Volatility is the average daily stock return variance and price and volume measure the average price (local currency units) and trading volume over an annual trading period. Turnover, price, volume, and market capitalisation are all log scaled in line with Stoll (2000). N is the sample size in firm months. The White cross-section t-statistics are in parentheses.

Dependent Variable:	Ghana (N = 731)			Nigeria (N = 1,935)			Cape Verde Islands (N = 117)		
	Bid-Ask spread (%)	Zero (%)	Liu	Bid-Ask spread (%)	Zero (%)	Liu	Zero (%)	Liu	
Intercept	0.476 [2.11]**	157.004 [12.44] †	5.881 [0.50]	0.178 [2.66] †	228.614 [27.88] †	20.793 [10.02] †	115.045 [5.91] †	29.535 [5.18] †	
<b>Regional Listings</b>									
Aggregate	---	---	---	---	---	---	---	---	
Senegal	---	---	---	---	---	---	---	---	
Benin	---	---	---	---	---	---	---	---	
Niger	---	---	---	---	---	---	---	---	
Burkina Faso	---	---	---	---	---	---	---	---	
Togo	-0.021 [-1.28]*	0.287 [0.14]	-4.375 [-4.10] †	0.006 [3.98] †	-3.251 [-2.14]**	0.288 [1.70]**	---	---	
Gambia	---	---	---	---	---	---	---	---	
<b>Institutional Control</b>									
Civil War	---	---	---	---	---	---	---	---	
<b>Governance Controls</b>									
State	-0.092 [-2.36] †	13.451 [6.50] †	-1.566 [-2.35] †	0.001 [0.54]	2.308 [1.35]*	0.926 [3.56] †	---	---	
Foreign Partner	-0.043 [-1.28]*	9.861 [5.73] †	-0.526 [-0.74]	0.0004 [0.26]	-1.285 [-1.63]*	-0.947 [-4.50] †	---	---	
Founder	-0.099 [-2.20]**	-2.043 [-0.70]	-0.539 [-0.53]	0.001 [0.91]	-1.676 [-1.84]**	0.225 [1.57]*	---	---	
Family/ Bus. Group	-0.063 [-1.94]**	2.158 [1.42]*	1.450 [1.29]*	0.001 [0.58]	-0.470 [-0.69]	-0.335 [-1.69]**	---	---	
Domestic VC	---	---	---	-0.001 [-0.21]	4.297 [4.42] †	-0.828 [-3.01] †	---	---	
Foreign VC	-0.124 [-3.26] †	-8.114 [-5.16] †	-2.018 [-1.29]*	0.004 [0.95]	-4.903 [-3.88] †	0.856 [2.58] †	2.432 [3.16] †	0.427 [1.33]*	
<b>Market Controls</b>									
Price	0.015 [0.99]	0.233 [0.41]	-2.999 [-3.89] †	0.005 [1.41]*	1.615 [2.04]**	-0.481 [-5.74] †	-2.092 [-1.05]	-1.999 [-2.90] †	
Volatility	2.765 [4.86] †	-31.299 [-1.28]*	5.020 [0.42]	0.325 [1.62]*	-618.433 [-2.14]**	-9.075 [-0.38]	-83.586 [-1.72]**	-4.296 [-0.47]	
Volume	0.010 [1.77]**	-1.806 [-10.38] †	-3.136 [-6.54] †	-0.003 [-4.40] †	-6.322 [-11.29] †	-1.211 [-10.38] †	-1.201 [-3.76] †	-0.724 [-6.09] †	
Size	-0.022 [-1.53]*	-2.127 [-3.78] †	2.715 [3.03] †	-0.006 [-1.87]**	-2.218 [-3.93] †	0.364 [3.57] †	0.173 [0.31]	0.520 [3.23]	
Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
F-stat (p)	11.17 [0.00]	23.81 [0.00]	62.30 [0.00]	10.47 [0.00]	198.48 [0.00]	65.25 [0.00]	8.28 [0.00]	20.27 [0.00]	
Adj-R <sup>2</sup> (%)	0.1823	0.3333	0.5733	0.0932	0.6819	0.4109	0.3053	0.5377	

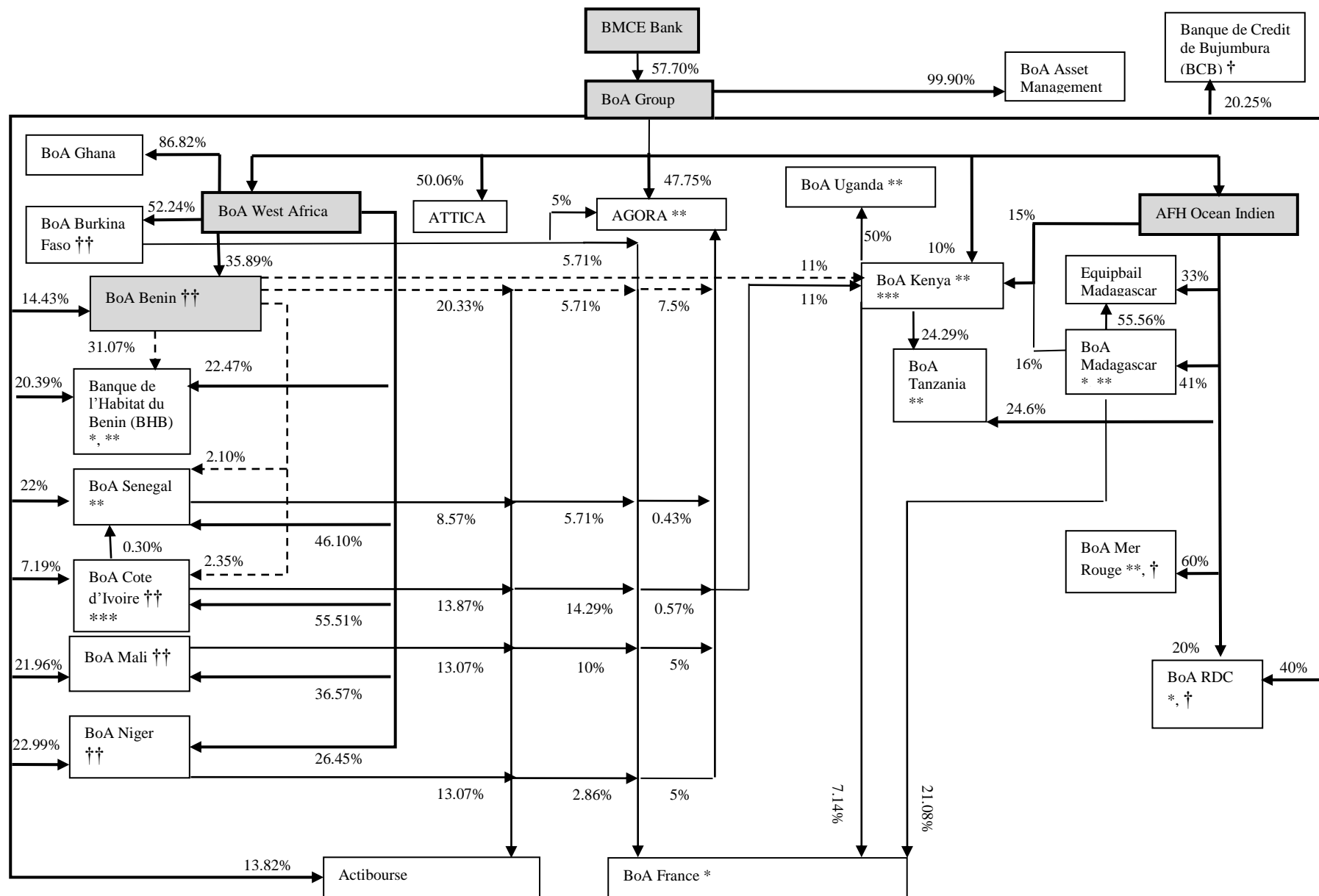
Notes: (1) \* p > 90% level; \*\* p > 95% level; † p > 99% level

(2) White cross section robust standard errors and covariances (d.f. corrected) (period clustering)

(3) Note that the total lack of trading (reflected in zero volumes for much of sample period) has caused the omission of Gambia's Trust Bank and Togolese ETI entity from Ghanaian sample. As such the only Togolese entity in Ghanaian sample is the locally incorporated Ecobank subsidiary.

(4) Quoted bid and ask prices are unavailable from Cape Verde exchange

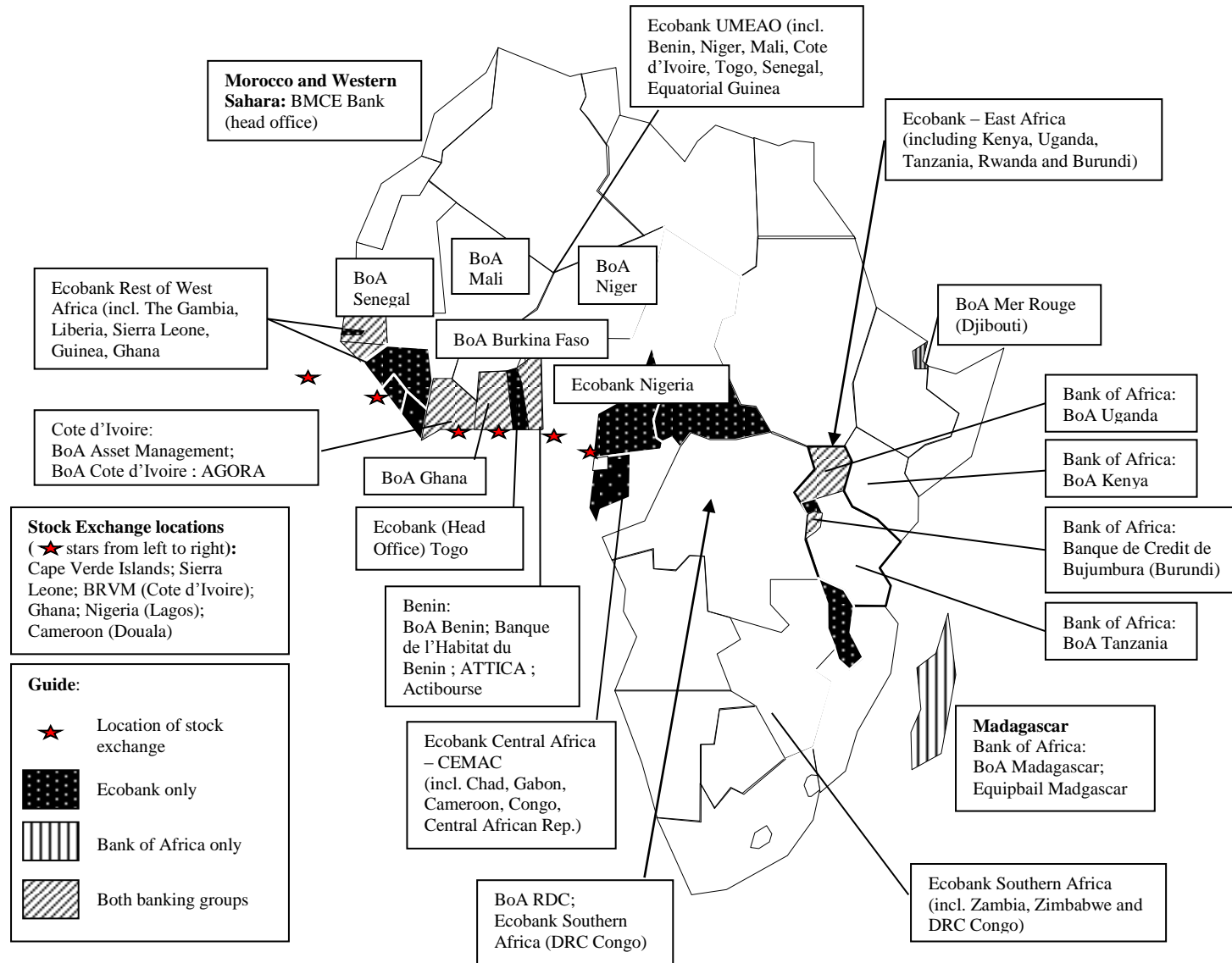
Figure 1. Extent of control of Bank of Africa business group, 2011



Notes: (1) \* PROPARCO; \*\* Netherlands FMO; \*\*\* AGORA; † Belgian BIO; †† ATTICA



Figure 2. Extent of expansion of Bank of Africa business group in contrast to Ecobank, 2012



**Appendix Table 1 Institutional differences across West Africa's equity markets**

	Legal origin	Economic system	No. Listed Firms	No. stock brokers	Corporate Governance Legal Framework	Accounting and Auditing standards
Cape Verde Islands	Portuguese Civil Code	Bank-based	4	3	National corporate governance code currently being drafted (before ratification in parliament)	Accounting standard regulators of the Bank of Cape Verde (BCV) has recommended the adoption of International Financial Reporting standards (IFRS) in 2008, but to date this has not been effected
BRVM	French Civil Code	Dirigiste model	47	9 in Cote d'Ivoire; 4 in Benin; 3 in Senegal; 1 in all other UMEAO countries	The Union Economique et Monétaire de l'Afrique de l'Ouest (UEMOA) zone has adopted the OHADA legal framework (Organization for Harmonization of Business Laws in Africa). The main statute that governs companies is the Uniform OHADA Act on company law (Acte Uniforme de OHADA relatif au droit des sociétés commerciales et du Groupement d'intérêt économique), adopted in 1997. UEMOA countries share a common securities regulator (Le Conseil Régional de l'Epargne Publique et des Marchés Financiers) and stock exchange (the BRVM)	The Conseil National de la Comptabilité (CNC) is responsible for formulating accounting standards in Cote d'Ivoire. Its responsibility is to adopt the accounting standards designed by the Conseil Comptable Ouest Africain (CCOA). All entities in Cote d'Ivoire (except for financial institutions) were required to prepare their financial statements in accordance with Système Comptable Ouest Africain (SYSCOA). However owing to relatively recent establishment of CCOA, the CNC-OHADA has been adopted in Cote D'Ivoire. Although CNC is trying to converge OHADA with IFRS, the two types of accounting standards are still quite different
Cameroon	French Civil Code	Dirigiste model	3	3	As for BRVM and UMEAO countries. Specific to Cameroon is the Règlement Général de la Commission des Marchés Financiers (CMF).	Accounting standard regulators in Cameroon are considering in adopting IFRS in early 2009 (IMF, 2009). However, up until 2009 accounting standards solely follow the OHADA framework
Sierra Leone	Common Law	Market-orientated	1	3	The Companies Act (2009); National corporate governance code not yet drafted; Sierra Leone stock exchange operations and regulation governed by the Interim Stock Trading Rules and Regulations (not ratified in parliament)	Sierra Leone has adopted IFRS for all firms (incl. unlisted). However by 2009 only one firm (Access Bank) has successfully adopted these
Ghana	Common Law	Market-orientated	42	16	Companies Code (1963), Securities Industry Law (1993) and the Regulations of the Ghana Stock Exchange; Investment Promotion Centre Act (1994)	Ghana has adopted IFRS, in place of National Accounting Standards, as of January 2007, for all listed companies, SOEs, finance entities and public utilities.
Nigeria	Common Law	Market-orientated	201	219	Companies and Allied Matters Act (1990); Banks and Other Financial Institutions Act (1991); Investments and Securities Act (1999); Securities and Exchange Commission Act (1988); Voluntary code of Best Practice for Public Companies (established by SEC, 2008)	Nigeria has a bifurcated system of International Accounting Standards (IAS) alongside local indigenous Nigerian Accounting Standards. However only 40% of Nigerian firms have adopted formal corporate governance measures (CBN, 2006)