

A Review of Asset Pricing With Risk-Return Relations In Sub-Saharan Africa

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ABSTRACT

This study examines the effect of illiquidity risk on expected excess stock returns in sub-Saharan Africa. Evidence exists to show that an expected stock return is positively correlated with market illiquidity in Sub-Sahara Africa. We also find evidence to show that global risk aversion has direct influence on the stocks markets of these sub-Saharan countries. Furthermore, we find that the US market serve as an important driving force in sub-Sahara Africa market as South Africa which play a bigger role in the region as far as market capitalization is concern has majority of its shares own by investors outside the region. It emerged that most markets in emerging sub-Saharan Africa have smaller capitalization and should therefore hasten their desire for regional market integration. We find cross-listing of some stocks in sub-Sahara Africa on the JSE and thus any downturn in the JSE also has serious consequences on their stock.

Keywords: Liquidity, Liquidity Risk, Asset Pricing, Emerging Market, Developed Market, sub-Sahara Africa.

I. INTRODUCTION

In financial economics, liquidity play a pivotal role in facilitating and influencing the allocation of resources by taking into account the associated risk. Liquidity refers to how swift a security of an investor is traded off in the stock market in order to prevent an eminent lose to the holder. The development of stock market in sub-Saharan Africa (SSA) gathered momentum in the early 1990s and has since been growing at a faster pace than ever thought. However, these markets are highly illiquid and tend to attract little capital inflow from portfolio investors due to a variety of factors. This has contributed to the lack of development on the continent and even when investment funds are made available; it comes with a high cost to the borrower. Lam and Tam (2011) document that liquidity is an important

factor for pricing returns in Hong Kong after taking well-documented asset pricing factors into account. Chiang and Zheng (2015) investigated the G7 markets and documented that excess stock returns are positively correlated with the market illiquidity risk, with Amihud(2002), Acharya and Pedersen (2005) investigating the US market. However, very little has been done as far as the market in SSA is concern. Our study focuses on the emerging sub-Sahara African market and the influence of the US market on the performance or otherwise of the market in sub-Sahara Africa.

Our paper contributes to the body of literature on liquidity and stock returns in the following ways: Firstly, to the best of our knowledge, our study is the first to empirically study the relation between liquidity and excess stock returns in emerging Sub-Saharan African countries.

Second, this study intends to verify the extent to which the US price factor influence markets from Sub-Sahara Africa. Since information is symmetrical and the global market is converging into a common market, we want to examine how the operations of the US and to some extent other G7 countries if any affect the stock markets in SSA. This will be done by examining the cross market influence of these countries on Sub-Sahara African. Third, this paper examine the illiquidity risk factors of Sub-Sahara Africa to know any trace of common characteristics or otherwise among them. The rest of this paper is organized as follows;

In section 2, we discuss the relevant literature in line with stock returns and liquidity risk. Section 3 looks at the methodology of the study. Section 4 reports of the main findings and section 5 serves as the conclusion of the study.

II. METHODS AND MATERIAL

1. Review of Literature

Liquidity is an important factor which is widely recognize in the pricing of securities in stock markets. The amount of return a security brings to an investor depends on its risk. While investors care about the likely return of an asset, we know that they also focus on the risk that is associated with the asset in question. Ackert et al (2010) indicates that an investor would not be indifferent between two assets that have the same expected returns but different levels of risk. According to Lee (2011), the pricing of global liquidity risk in developed countries and in countries with low information asymmetry, low political risk, and large cross-border holdings implies the importance of global investors and the relatively high degree of financial market integration in such countries. Chan, Covrig, and Ng (2005) proved that countries that exhibit the above properties serve as an attractive destination for global investors.

Traditional asset pricing models often ignore the illiquidity effect by assuming that stock returns

can be explained by their fundamental factors (Chiang and Zheng,2015).In treating liquidity, empirical evidence shows that the illiquidity of assets attract a premium. Vu et al. (2014) document that since liquidity is lower during down markets, the required premium for bearing liquidity risks should be higher in down markets than in up markets.

Recent strand of investigation into the relation between liquidity and excess stock returns are shifting to a time-series approach in understanding liquidity and its role in stock returns. For instance, Amihud (2002), Jones (2002), and Pastor and Stambaugh (2003) indicates that the correlation between realized excess returns and the change in illiquidity is negative. This sum up to indicate that positive shocks of illiquidity with respect to its compensation points to a poorer performance of the stock of those markets. For such stocks to attract investors, price will have to fall in order to compensate the investor who intends to hold it in periods of downturn.

It is anticipated that in the modern world, because of volatility of the global market, many investors are careful in their dealings with respect to where their investment goes. According to Ackert et al (2010), an investor would prefer the asset that has a more certain outcome or less uncertainty about possible returns. However, little attention is paid to the illiquidity of an asset since the strand of the traditional literature suggest that illiquidity of an asset can be explain from other fundamental factors aside the illiquidity phenomena. However, recent literature indicates that, fundamental theories cannot explain the dynamics of liquidity alone. For instance Amihud (2002) indicates that the liquidity of an asset is dependent on the bid-ask price of the asset in question.

In the trading of some assets, it becomes extremely difficult in finding a suitable buyer due to the uncertainty surrounding its liquidity. This tends to make it extremely burdensome in trading assets on the security market especially if the dealer wants to sell it at the full market value (Mallison and

French 2000). In the same way, a buyer may also decide to make a maximum use of his resources by waiting for the arrival of a seller who may be willing to dispose of his item at a price lower than its market value. To avoid delay associated with the waiting time and its implicit cost, both the seller and the buyer will have to compromise their stands. This occurs when dealers are willing to satisfy both buyers and sellers for an immediate consummation of the transaction; this is the bid-ask price, the cost of the overall transaction.

The stock market in Africa has not developed to a stage which can be considered as a world acclaimed stock market. For instance, the total stock market capitalization in Africa is less than 2% of the world market capitalization. The Johannesburg Stock Exchange (JSE) which is considered as the largest in Africa account for a figure closer to 75% with the Alexandria Stock representing 10% of the total Africa market Capitalization (Sally, 2013)

Within a relatively short period however, stock market in Africa has made a tremendous surge in terms of their growth in numbers. There were only 11 stock markets operating in sub-Sahara Africa by the end of 1997. Today, the stock markets have increased to more than 20 including one of the only regional stock exchanges in the world, linking eight French-speaking countries in West Africa. (Sally, 2013). In general, the performances of African stock markets are weak and their liquidity is limited (African Union, 2008).

The total value of African stocks outside South Africa is only 0.6 per cent of all emerging-market stocks. The exchanges are also small relative to their own economies. Market capitalization in Nigeria is only 8 per cent of GNP, while Kenya, Ghana and Zimbabwe's capitalizations are 25-35 per cent (Sally, 2013)

Rouwenhorst (1999) examines the source of returns variation in emerging stock markets. In a sample of 1705 firms from 20 emerging markets, he finds that the return factors in

emerging markets are quantitatively similar to those documented for many developed markets.

In discussing issues on emerging markets in his study, Sen (2009) profile that there exists a negative relation in the Indian National Stock Exchange (NSE) between illiquidity shocks and monthly market returns. Also, Amihud and Mendelson (1986) argue that illiquidity is a risk to investors and should be taken into account when assets are priced.

The study by Amihud and Mendelson (1986) is one of the first to empirically examine the relation between liquidity and stock returns. Using a sample of NYSE stocks from 1961 to 1980, they find a positive relationship between stock returns and bid-ask spreads after controlling for stock beta. Following Amihud and Mendelson (1986), numerous studies examined the role of liquidity in pricing assets using different proxies for liquidity. It is interesting to find out that in their investigation, Brennan and Subrahmanyam (1996) find a positive relationship between stock returns and the variable component of the bid-ask spread. Datar et al. (1998) document a negative relationship between stock returns and share turnover with Acharya and Pedersen (2005) presenting a liquidity adjusted CAPM (a 4- β model), in which the liquidity risk is decomposed into 3 parts. They use the illiquidity ratio of Amihud (2002) and confirmed the existence of a liquidity risk.

The Australian market provides an interesting setting in which to study the relations between liquidity and stock returns. Vu et al. (2014) find strong evidence to prove that the liquidity risks in the Australian security market which is rank second in the Asia-Pacific and eighth in the world in terms of total market capitalization is priced. The combined liquidity risk in the Australian market is significantly positively associated with stock returns, even across size subgroups (Vu et al., 2014). The strand of literature existing today shows a trend that indicates that the effect of liquidity risk on asset pricing may not exhibit

similar patterns during up and down markets (Hameed et al., 2010; Pástor and Stambaugh, 2003; Anthonisz and Putniņš, 2014). Vu et al. (2014) document that liquidity is lower during down markets and that the required premium for bearing liquidity risks should be higher in down markets than in up markets.

Amihud and Mendelson(1986) and Eleswarapu (1997) found a significant positive effect of quoted bid-ask spreads on stock returns(risk-adjusted). The results are very similar to Amihud(2002) and Liu(2006) illiquidity proxies, ILLIQ and LM1,respectively,which also experience similar returns. In their work, only the most illiquid portfolios exhibit significant and negative returns, and the return difference between the least liquid and most liquid portfolios is significantly negative at around 1% a month. Chalmers and Kadlec (1998) used the amortized effective spread as a measure of liquidity, obtained from quotes and subsequent transactions, and found that it positively affects stock returns. Brennan and Subrahmanyam (1996) measured stock illiquidity by price impact, measured as the price response to signed order flow (order size), and by the fixed cost of trading, using intra-day continuous data on transactions and quotes.

Kyle (1985) proposed that because market makers cannot distinguish between orders flow that is generated by informed traders and by liquidity (noise) traders, they set prices that are an increasing function of the imbalance in the order flow which may indicate informed trading. This creates a positive relationship between the order flow or transaction volume and price change, commonly called the price impact

One effect of expected returns to covariation is a security's illiquidity and the market return. This effect is as a result of the willingness of investors to accept a lower expected return on a security that is liquid in a period of downturn. When the market declines, investors are poor and the ability to sell easily is valuable (Acharya, Pedersen, 2005). Hence, an investor is willing to accept a

discounted return on stocks with low illiquidity costs in states of poor market return. (Acharya, Pedersen, 2005).

The effects of liquidity risk are found to be consistent across all of the size groups in the market. These results suggest that investors require liquidity risk premiums for both large and small stocks. (Acharya and Pedersen, 2005) found that the net liquidity risk and aggregate systematic risk strongly affect the returns in down markets. It is interesting to note that a number of studies found that the liquidity effect in sub-Sahara Africa is dominated by the size effect. For instance, despite being adjudged as the world's best performing market at the end of 2004 with a year return of 144 per cent in US dollar terms compared with a 30 per cent return by Morgan Stanley Capital International Global Index (Databank Group, 2004), report suggest that the Ghana stock market has a small market size, low market liquidity, and low market participation by the public (Acquah-Sam & Salami, 2013). Limkriangkrai et al. (2008), for example, report that liquidity is price only in the smallest stocks.

In contrast, other studies report that liquidity is priced only in large firms. For instance, Fabre and Frino (2004) found that commonality in liquidity is mainly a large firm phenomenon. They argue that the co-movement in liquidity is caused by institutional trading, which occurs more frequently for larger stocks. These studies show that liquidity and size are closely related.

Vu et al. (2014) suggest that when the liquidity level of a stock decreases as the market liquidity decreases, investors require a higher expected return because they are less willing to hold such an asset. This finding is also consistent with Cochrane's (2001) wealth effect theory.

Chodia et al. (2000) document that liquidity risk and aggregate systematic risk, are positively related to stock returns after controlling for other variables that are known to affect stock returns which indicates that liquidity risks are significantly

priced. This goes on to empirically prove that stocks with higher levels of liquidity risk show signs of higher expected returns. The finding is in line with both theoretical and empirical evidence of asset pricing.

2. Methodology of the Study

2.1 Measurement of Liquidity

In our quest to understand the relation between liquidity risk and expected excess stock returns, it is important at this stage to envisage which of the numerous measurements of liquidity will suite our current study to achieve the desire result. It is important however to note that liquidity cannot lend itself to one form of explanation. Indeed, it is a multifaceted concept which explains itself from different dimensions.

We decided to use the Amihud (2002) illiquidity ratio which captures the price movement associated with trading volume, which is in line with the price impact concept of Kyle (1985). It is defined as the average ratio of absolute daily returns to daily dollar trading volume.

The monthly illiquidity for stock is given by the ratio:

$$ILLIQ_{i,t} = \frac{1}{D_{i,t}} \sum_{d=1}^{D_{i,t}} \frac{|R_{i,t,d}|}{V_{i,t,d}}$$

Amihud defined the above measurement as

$R_{i,t,d}$ = absolute returns of a stock i on a day d and of a month t

$V_{i,t,d}$ = trading volume (in millions of dollars) for a stock i on a day d and of a month t

$D_{i,t}$ = number of trading days for stock i in month t

The monthly Amihud illiquidity is simple the average of the daily return-to-volume ratio within a month. According to Amihud, any kind of stock which appears to be more liquid must necessarily have lower price movements at a given amount of trades, indicating that such a stock has the greatest

ability to attract larger trading volumes. Higher values of the Amihud ratio should therefore be associated with lower liquidity. Drawing our lesson from Amihud (2002), we derive a firm's illiquidity from a residual autoregressive process given by:

$$\ln(Illiq_{i,m}) = \beta_0 + \beta_1 \ln(Illiq_{i,m-1}) + \varepsilon_{i,m}$$

where β_0 and β_1 are constant coefficients of the regression, $Illiq_{i,m}$ is defined as in the equation above with $\varepsilon_{i,m}$ referred to as the innovation term of illiquidity for a firm represented by i at time t .

Traditionally, it is expected that excess stock returns will be positively correlated with liquidity risk in the sense that any stock with a lower liquidity is expected to attract a higher price if investors are to hold it.

The Amihud illiquidity ratio has been used extensively by many researchers in their attempt to find answers to the relations between liquidity and excess stock returns (Karolyi et al., 2012; Bekaert et al., 2007; Lesmond, 2005 and Chiang & Zheng 2015) due to the fact that its calculation is not premise on high-frequency. This methodology can be akin to the one propose by Fama and French (1992), though Fama and French group their portfolios base on size and pre-ranking of beta. The formation of portfolios based on pre-ranking beta has been widely used in the literature on empirical asset pricing, because the estimation of post-ranking beta for portfolios sorted on pre-ranking beta provide a wide dispersion of estimates across portfolios, while minimizing loss of information that might be caused by portfolio formation (Fama and MacBeth, 1973).

III. RESULTS AND DISCUSSION

3. Empirical Evidence

3.1 Excess Returns and illiquidity

Amihud (2002) document that expected stock excess return reflects compensation for expected market illiquidity, and is thus an increasing function of expected market illiquidity.

An important component of the early literature spearheaded by Amihud is that the cost of transaction is the spread between the bid-ask prices at which dealers are willing to satisfy sellers and buyers demands for immediate execution of their transaction (Yakov Amihud, 2002).

The use of the Amihud illiquid ratio also means that the results from other jurisdictions outside the US market such as the Asian and African emerging markets are comparable to the U.S. evidence as documented in Acharya and Pedersen (2005), Lee (2011), Vu V. et al (2014) and Chiang and Zheng(2015). Their model of liquidity risk complements the existing theoretical literature on asset pricing with constant trading frictions (see, for instance, Amihud and Mendelson, 1986; Constantinides, 1986; Vayanos, 1998; Vayanos and Vila, 1999; Duffie et al., 2000, 2003; Huang, 2003; Garleanu and Pedersen, 2004).

To find empirical evidence between illiquidity risk and excess stock returns, Chiang & Zheng (2015) includes Amihud's (2002) illiquidity factor into their basic CAPM framework which is similar to the case with the Fama–French price factors and conclude that the return on stock with the most illiquidity is lower compare with the low illiquidity stock when dealing with all the G7 markets. The result is in conformity to existing literature.

It is worthy to note that systematic liquidity shocks influence optimal behavior of dealers bearing in mind that in the real sense, stocks usually tend to underperform in periods of recession which can be attributed to aggregate-wide liquidity restrictions. As a result, we may turn to have a situation of a better return on stocks to be positively sensitive to systematic adverse liquidity shocks. This has been elaborated by Pastor and Stambaugh (2003) and Acharya and Pedersen (2003), that when investors face an economic recession, and their overall wealth decreases, they may be forced to liquidate some assets to pay for their purchases. Unfortunately, this is relatively more costly when liquidity is lower, particularly when wealth has dropped and marginal utility is higher.

3.2 Fama-French 3 Factor Variables

The Fama-French (1993) model is one that give credence to itself by having significant explanatory power in the explanation of excess stock returns in the process of analyzing empirically asset pricing. Markiel G.B. (1995) incorporates the model in his equation in an attempt to explain the relation between excess stock returns and the illiquidity of an asset. He was able to demonstrate that stocks that perform well have a better average performance in terms of their returns in the following year. Chiang and Zheng (2015) indicates however that losers in the previous year perform better the following year than past winners for investors who operate in the G7 markets. De Bondt and Thaler (1985, 1987), Chopra et al. (1992), and McLean (2010) provide empirical evidence to support this assertion. In a global economy, investors are encouraged to look elsewhere for information concerning the performance of stocks in their desire to invest. Since the US market plays a key role in the investment environment as well as its dominance in the investment market, investors normally use the US market as the yardstick to predict the trend of the global market.

Evidence is there to show that excess stock returns correlate with market volatility. Whaley (2009) in his research revealed that the volatility seen in the Chicago Board Options Exchange (CBOE) volatility index (VIX) remains unstable during market turmoil, indicating a period in the market where an increase in the volatility in the market leads to a fall in the price of stock as a way of compensating the investor in putting his investment in an asset that is illiquid. Chiang & Zheng, (2015) document that all of the domestic Fama–French factors are positively associated with excess stock returns, and the estimated coefficients are statistically significant. This holds true for all the different markets under review. It is interesting to note that if a cross-market US Fama-French three factor model is work out, the quantum of the coefficient from the various foreign components is smaller than the domestic market. This goes to confirm that the domestic market has more influence than the foreign components. This is in line with the findings of Griffin (2002) who documents that the Fama-French factors are country specific and shows that factors within the local market are better in explaining any time-series differences than the explanations given by the global factors. Moving forward, it is understandable that other factors are able to explain stock markets in other

markets such as the United Kingdom, Germany and Switzerland than the foreign Fama–French components.

Even though, US market is considered the dominant market in the world, due to symmetrical information in the world, a weaken US market will see investors shifting to other non- US markets. This is indicated in the work of Chiang & Zheng (2015) who find the sign for non-US advanced markets to be positive (except for France). This conforms to the assertion that a rise in volatility in the US market will result in a shift of asset holders' investment to other markets as they hedge it against the US market which in the long run will push prices up. Chiang & Zheng (2015) this confirm the

existing literature that local stock markets perform better than the global one.

3.3 Is Liquidity Priced?

Several studies including the Fama-French model when applied to different markets shows consistency in the explanatory ability of the model. In our desire to find out the returns on stocks in some of the emerging markets, we took Ghana's Stock Market (GSM) which is classified as a lower middle income country by the International Monetary Fund (IMF) to assess the asset pricing characteristics of the GSM. The table below is the regressions on the asset characteristics of the Ghana Stock Market from 1992-1997.

Table 1

COMP	ABL	AGC	CFAO	EIC	FML	GGL	HFC	KBL	MGL	MLC	MOGL	PTC	PZ	SCB	SPPC	UNIL
α_i	1.866	-0.36	0.95	0.989	2.041	1.037	1.228	1.918	0.987	5.855	2.999	1.909	3.131	2.012	-0.22	-0.79
SE(α_i)	2.996	0.114	2.669	1.874	3.723	1.969	0.5669	1.77	0.942	4.26	1.855	1.735	2.258	1.635	0.708	1.514
t(α_i)	0.623	-3.14	0.356	0.528	0.548	0.527	2.1662	1.084	1.048	1.374	1.617	1.101	1.387	1.23	-0.31	-0.49
β_i	0.699	1.158	0.257	0.373	1.331	1.158	-0.249	0.318	0.304	0.869	0.529	-0.01	-0.24	0.651	-0.12	0.909
SE(β_i)	2821	0.02	0.244	0.121	0.25	0.204	0.1347	0.103	0.083	0.525	0.144	0.146	0.146	0.095	0.063	0.133
t(β_i)	2.476	58.6	1.055	3.073	5.32	5.678	-1.852	3.091	3.657	1.655	3.667	-0.04	-1.63	6.869	-1.97	6.839
R^2_{bar}	805	0.99	-0.02	0.329	0.277	0.29	0.1162	0.319	0.16	0.033	0.331	0.001	0.12	0.474	0.037	0.359
DW	2.005	1.968	1.99	1.999	1.999	1.984	2.004	1.992	2.007	2.02	2.001	1.991	1.992	1.994	1.983	2.002
Obser.	81	39	65	81	81	81	29	81	69	39	73	81	81	81	62	81

Only 16 out of the possible 34 stocks listed were considered due to the lack of trade on the floor for the other listed stocks on the market which was established in 1990. From table 1, it can be seen that the beta (β_i) values of the listed stocks ranges from -0.8686 for Mechanical Lloyd Company (MLC) to 1.33 for Fan Milk Ghana Ltd. (FML). Out of the 16 listed companies, three companies namely AGC, FML and GGL shows betas that are greater than one and also having a significant t-values indicating that their systematic risks are greater than the market beta of one. Again, out of the 16 stocks traded, 8 of them have positive betas. With this kind of stocks, when liquidity

is low, to dispose of such assets require that their prices are high to serve as attraction for investors to hold during periods of downturn markets. With the exception of CFAO, all the t-values of these stocks are significant. Five stocks—Home Finance Co. (HFC), Mechanical Lloyd Co. (MLC), Pioneer Tobacco Co. (PTC), Peterson Zochonis (PZ) and Super Paper Products Co. (SPPC)—have negative betas. With the exception of SPPC, the t-values of these stocks are not significant. The values for R-squared-bar values are low, indicating little or no relationship between the variation in returns for these stocks and the market returns. Many questions presumable may be asked

concerning the data such as whether the estimated beta values are appropriate and also whether the results are consistent with the market situation. It must however be said that since much has not been done in such a market environment, the researchers have little to draw on with respect to consistency.

A number of questions may thus be posed; are the estimated beta values appropriate? Are the results consistent with earlier literature? These are legitimate questions to ask. The difficulty however, lies in the fact that not much had previously been done to premise the study on. Perhaps, this calls for intensive work to achieve this especially now that the rest of the world is moving towards Asia and Africa

3.4 Illiquidity Effect

Many of the current strands of literature indicate that stock returns behave differently during up and down markets (Chiang and Zheng, 2010). The fact underpinning this phenomenon indicates that in a period of downturn markets, illiquid stocks attract high return premium in the pricing of asset as illiquidity risks are factored into the asset pricing formula (Brennan et al., 2011).

It is however interesting to indicate that recent studies done by some researchers do not point to this fact. Many of these researchers are of the view that liquidity premium do not show any difference in different sample periods. Easley, Hvidkjaer, and O'Hara (2010) documents that using Amihud (2002) model, liquidity factor is significant only in the period from 1963–1983 but not in the sample period of 1984–2002. Chiang & Zheng(2015) break down their sample into two equal halves according to Easley et al. (2010) in their attempt to find any liquidity effect for the G7 countries in different time periods as experienced by other researchers. Consistent with past empirical evidence, their results points to a situation in which expected excess stock returns are positively related to market illiquidity risk and negatively correlated with the illiquidity innovation under up market conditions for all of the G7 countries.

Nhut and Ka(2012) experiment with many of the existing measures of liquidity to find whether (i)there is liquidity premium in New Zealand and also (ii)whether liquidity is priced in New Zealand as can be seen in the United States of America. Their measure of

liquidity includes the effective bid–ask spread (denoted VESP), the quoted bid–ask spread (TQSP) in addition to Amihud's (2002)illiquidity measure (ILLIQ),Liu's (2006)illiquidity proxy (LM1), Pastor and Stambaugh's (2003)price impact (PS), share turnover (STURN), and dollar trading volume (DVOL). They found that there is no illiquidity premium for New Zealand stocks.

Their results indicate that illiquid stocks earn significantly lower returns compared to liquid stocks which are consistent across the methods they use and robust to the presence of common firm-specific characteristics and risk factors such as size, book-to-market (BM), and momentum. Regarding the asset pricing of liquidity risk, they did not find significant relations between liquidity risks and expected stock returns. The portfolio method and regression method use both provide consistently insignificant evidence that liquidity risk is priced by investors.

3.5 Portfolio Analysis

From the study of illiquidity, it is established that the effect of illiquidity on stock return may not exhibit the same stock characteristics. It is empirically proven by Amihud, (2002) and Pastor and Stambaugh (2003) that smaller stocks are more sensitive to liquidity risk. According to Ghysels and Pereira (2008), optimal portfolio is stronger in liquidity when investing in small stocks at shorter time horizons, since smaller stocks are more likely to be affected by market distress. Acharya and Pedersen (2005) in their study found that the net liquidity risk and aggregate systematic risk strongly affect returns in down markets. A number of studies find that the liquidity effect in Australia is dominated by the size effect. Limkriangkrai et al. (2008), for example, report that liquidity is price only in the smallest stocks in Australia. They argue that the liquidity effect is subsumed by the size effect because smaller stocks are more likely to face higher liquidity costs. This go to confirm the assertion that illiquidity effect is stronger when dealing with firms with smaller market capitalization such as those in the sub-Sahara Africa.

The strand of the early literature document that other stock characteristics such a book-to market ratio (Fama & French, 1993), idiosyncratic risk (Chan, Hameed, & Kang, 2013; Fu, 2009), skewness and kurtosis of stock returns (Conrad, Dittmar, & Ghysels, 2013), and stock

illiquidity itself could influence the relation between excess stock returns and liquidity.

In our analysis to find out what patterns in the emerging markets of sub-Saharan Africa, we adopted the report of the World Bank of some selected African markets to study their liquidity risk with respect to the size of their markets. In all, eleven stocks were selected from sub-Saharan Africa. The correlation of the stock prices of the Johannesburg stock market which is seen as the largest market in sub-Saharan Africa and the rest of the region were positive. Their price indices turn to move in the same direction as that of the global market. A report by the IMF in 2012 on the economic and financial survey of sub-Saharan African countries indicates that cross-border portfolio investment involving South Africa and the rest of the sub-Saharan countries amount to only 1% of the partners GDP except for Mauritius and Namibia who have dual listing with the South African market. The correlation between stock prices in the Johannesburg Stock Exchange (JSE) and other price indices in the region is positive.

Global market players (investors) in time past have paid less attention to the sub-Saharan Africa due to lower stock capitalization and trading in these markets except in the JSE. In recent times, according to Sam-Acquah (2014), global investors are given some attention to the stock markets in the sub-Saharan African countries such as the listing of Tullow Oil on the Ghanaian stock market on Wednesday, July 27, 2011. According to the World Bank report (2012) on sub-Saharan Africa, the Johannesburg Stock Exchange (JSE) is not only the largest stock exchange in sub-Saharan Africa, but is also among the 15 largest in the world. It has close connections to the London stock exchange, including dual listings of some of its largest stocks. U.S. investors hold a significant amount of the stock value on the JSE. In the event of a slowdown in the JSE, its effect will be devastating for most sub-Saharan African countries. In order to appraise the South African stock with the rest of the sub-region, we selected the stock markets of some countries from 1999M1–2012M7, to model sub-Saharan Africa stock prices as in Saadi and Williams (2011).

Table 2

	Market Capitalization (Percent of GDP)	Stocks Traded Total Value (Percent of GDP)	Turnover Ratio (Ratio)	Firms Listed at the JSE(Numbers)
South Africa	210	91.2	39.8	...
Zimbabwe	110	4
Mauritius	58	4.6	8.0	1
Uganda	46	0
Kenya	30	2.6	7.1	0
Malawi	24	0.9	3.9	1
Botswana	23	0.8	3.6	6
Nigeria	17	1.8	9.2	1
Namibia	9	0.1	1.2	16
Ghana	8	0.3	4.1	1
Tanzania	6	0.1	2.5	0

IV. CONCLUSION

Adopted from: World Bank, World Development Indicators (2012) From table 2, it is realized that the stock prices in sub-Saharan Africa has its prices increasing (falling) when the global risk aversion falls

(increase) as proxied by the Chicago Board of Options Exchange Volatility Index, VIX when stock prices falls (increase). This indicates that the global market especially that of the US has direct influence on the stocks of these markets in sub-Saharan Africa. A greater percentage of the stocks in the JSE are directly owned by investors outside the confines of South Africa.

Again, as envisaged, the only stock that reacts to the regional turbulence is the Namibian stock. This is not surprising since the Namibian stock has a cross listing with the JSE which makes it imperative to be influenced by such shocks.

Sub Saharan African countries should invest more in their stock markets to make it more attractive and efficient in the area of better bond markets, well establish stock market with the needed personal, logistics to make it work. This will make it possible when sourcing for funds from investors outside Africa and other capital markets such as the Millennium Development Goals (MDGs) of the US. This will go a long way in increasing the investment on the continent

It is our considered opinion that the integration of the various regional blocks should be intensified than it is happening which is crucial for the mobilization of resources needed to carry out regional integration objectives. This will make global investors show interest than the fragmented smaller markets existing now.

There should be the promulgation of policies that will drive away the fear of potential investors into the economies of sub-Saharan African countries. Policies that will eliminate the bottlenecks for free mobilization of capital and the adoption of all international best practices should be encouraged. There should be more political stability, rule of law transparency and less bureaucracy leading to bribery sub-Sahara Africa.

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