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Market Liquidity and Stock Size Premia in Emerging Financial Markets: The Implications for Foreign Investment

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Abstract

Equity markets are increasingly seen as important sources of investment funds in many emerging economies. Furthermore, many countries see the development of such markets as a means to facilitate both foreign equity portfolio investment and foreign direct investment (FDI). This may occur through acquisition of shareholdings in domestic companies, which supplements the low levels of funding from domestic savings. But many emerging stock markets exhibit substantial risk premia that increases the cost of equity for listed domestic firms and deters potential foreign investors. This paper estimates the cost of equity in four major African markets: South Africa, Kenya, Egypt and Morocco. These represent the largest and most developed equity markets in Africa and also act as regional hub markets. London is also included as a link between the emerging and developed financial markets. The Fama and French (1993) three-factor model Capital Asset Pricing Model is augmented to take account of company size and illiquidity factors that feature in African financial markets. Results show that the premia associated with size are more prevalent than with liquidity although both are highly significant in both valuation and cost of equity estimates. The evidence suggests that the lowest cost of equity is achieved in the two major international markets of London and Johannesburg, while the less-advanced North African markets of Morocco and Egypt have higher costs of equity. The developing Kenyan market has the highest cost of equity, although the costs associated with the main market are less than one-third of that in the Alternative Investment Market.

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1. Introduction

Equity markets are increasingly seen as important sources of investment funds in many emerging economies. Furthermore, many countries see the development of such markets as a means to facilitate both foreign equity portfolio investment and foreign direct investment (FDI). This may occur through acquisition of shareholdings in domestic companies, which supplements the low levels of funding from domestic savings. But many emerging stock markets exhibit substantial risk premia that increases the cost of equity for listed domestic firms and deters potential foreign investors.

This paper estimates the cost of equity in four major African markets that represent the largest and most developed equity markets in Africa and which act as regional hub markets. Johannesburg dominates the Southern African Development Community (SADC), Kenya is at the centre of the East African Union, and Egypt (the Cairo and Alexandria Stock Exchanges) leads the North Africa and Maghreb region. Morocco (the Bourse de Casablanca) is included as this is the only other major equity market in North Africa. Other markets have been omitted because of their very small size and severe illiquidity. All four markets have attracted interest from international investors and multinational enterprises. In particular, MNEs in the mining sector (for example, Anglo American, Anglo Gold, and Anglo Ashanti) and in the financial sector (such as Old Mutual, Standard Bank, Standard Chartered, Barclays, Société General, and BNP Paribas) participate in these economies. In many cases, these companies dominate the domestic markets and create a very uneven degree of liquidity. In addition, London is included as a representative of a developed market. This is especially appropriate as the London Stock Exchange and the African exchanges all fall within a +/- 2 hour time zone and London is the market on which many African firms are dual-listed.

The paper proceeds as follows. Section 2 describes the institutional characteristics of these markets, the source of the data and the construction of the illiquidity series. Section 3 provides a brief review of the literature on the Capital Asset Pricing Model (CAPM) and introduces the three-factor model of Fama and French (1993). Section 4 outlines the model to be estimated, which is based on the Fama and French (1993) model, but augmented with an illiquidity measure proposed by Amihud (2002). Section 5 discusses the construction of the data series, presents the descriptive statistics, and explains the estimation methodology. The results are in Section 6, including those for the grouped data and the individual markets. The final section concludes and offers some policy recommendations.

2. Institutional Characteristics of the African Markets

There are clear differences in the institutional design, market capitalisation and level of development of the four emerging markets considered in this paper. The major characteristics of these markets are summarised below, but see Piesse and Hearn (2005) for an extended discussion of African stock markets.

2.1 South Africa.

The Johannesburg Stock Exchange (JSE) is the largest, most developed, and best regulated market in Africa. The JSE adopted the order-driven electronic trading platform used by the London Stock Exchange in 2002. Trading takes place daily and the market has a pre-opening electronic call auction 8-25am and 9-00am and continuous trading 9-00am to 4-00pm. Despite being classified as an emerging market there is considerable institutional investor participation and ownership is highly diversified, unlike any other market in Africa. (Bloomberg LP, 2006). Settlement is through a central depository on a rolling contractual basis of trade date plus five working days (T + 5) and is largely G30 compliant (STRATE website, 2007).

The South African market has experienced two distinct periods of transition during the sample period. The first was 1990 to 1995 when the market was closed to foreign investors, largely due to sanctions by the rest of the world. Also at this time, domestic investors had to comply with the National Party's *prescribed assets regulation*, which emphasised investment in domestic equities rather than money or bond market instruments (Grandes and Pinaud, 2004). The second followed the ending of apartheid in 1995 and the subsequent real and financial market liberalisation that followed, including the opening up of markets to foreign institutional investment, the move to electronic trading and the introduction of formal legislation to ensure international levels of corporate governance.[1] Further revision of the Kingly report in early 2000 has led to increased investor confidence and market development although competitiveness has been hindered by volatility of the domestic currency and high risk premiums that have a negative impact on overseas investors (Grandes and Pinaud, 2004). This has also resulted in a loss of liquidity in the domestic market and the tendency for primary listings to take place on overseas exchanges such as London and New York in preference to the JSE.

2.2 Kenya.

The Nairobi Stock Exchange (NSE) is the largest market in the East African Community (EAC) and is the only one open to foreign investors.[2] The policy to enhance competitiveness in the smaller financial markets relies on regional integration and the East African centre is Nairobi, which houses the central depository. Trading takes place daily by a central electronic book entry system, and is limited to the floor of the exchange between 10-00am and 12-00. The market is dominated by blockholders and smaller retail investors and free float percentages are low.[3] Order flow to the market is by a small network of licensed stock brokers and their regional affiliates. Investors are required to establish both a trading account with the broker and a separate individual account at the central depository. The dissemination of market sensitive announcements and real-time prices takes place through an investor relations officer inside the exchange and this is then passed to the financial press. Public releases of shares in the primary market and IPOs are managed through local investment banks, with the Capital Markets Authority responsible for regulation and supervision. There is no formal

corporate governance regime, although larger companies try to follow best practice as set out in the Cadbury Report, particularly with respect to disclosure of directors' holdings. In a market dominated by the informal sector, and where so few companies can afford the listings fees and ongoing regulatory costs, strictly following good governance is prohibitive and a considerable deterrent to listing.

2.3 Egypt

The Egyptian stock exchange is one of the oldest in Africa. It is based on two sites, Cairo as the principal, and a smaller exchange in Alexandria. The Cairo floor was established in 1903 and Alexandria has functioned since 1899 when it was used primarily for trading commodities and cotton. Now the sites are integrated and share an electronic trading platform and settlement facilities. The securities market itself is split into three markets: Over the Counter, Primary Dealer Bonds and Listed Securities. Trading in equities is from 10-30am to 14-30pm daily and the electronic order matching system is supported by extensive market reporting that relays stock news and trading information to market participants. The trading system is centred on the floor of the exchange although there is also a new innovation in the form of a remote access system available to the brokerage community (CASE, 2008). However, although the system handles approximately 70,000 trades daily there is no pre-opening call auction to allow overnight news and information to inform morning prices. This will change as the existing electronic trading platform is to be replaced by a more sophisticated one incorporating pre-opening call auctions that will be able to handle larger trading volumes. Settlement is fully G30 compliant and takes place through the central depository as well as a sophisticated network of well capitalised domestic and international custodian banks (CASE, 2008).

2.4 Morocco

The Moroccan stock market, the Bourse de Casablanca, was established in 1929, making this market one of the oldest in North Africa. The exchange has progressed through several phases of development and in 1997 adopted an electronic trading system based on order matching located centrally. The trading system was improved further in 2001 to facilitate delocalised trading from the offices of the local brokers. MAROCLEAR, the national central securities depository, was established in 1998 for settlement, securities transfer and payment and to minimise operational risks. This became fully G30 compliant by 2001 with settlement versus delivery occurring on trade date plus three working days (Bourse de Casablanca website, 2008). Trading is reported electronically to market participants and to international data vendors such as Bloomberg and Reuters. This gives the market the opportunity to attract overseas investors. Stock market awareness is high and the exchange is used as a successful route for domestic flotation, although it also attracts significant retail and institutional investors.

2.5 Comments

All four African markets have low levels of liquidity compared with developed world markets, but this is particularly true in Kenya and Morocco, which are the two smallest markets in the sample. Risks associated with liquidity are cited as a major concern for overseas institutional investors and hinder participation in emerging stock markets (Kenny and Moss, 1998). These markets all present some degree of risk and illiquidity, which makes this sample very appropriate for modelling a risk-adjusted capital asset pricing model. Furthermore, given the need for finance in order to promote economic growth and development in Africa it is essential that equity markets are competitive and attract capital. Companies seeking to raise funds on markets that have higher costs of equity are at a distinct disadvantage compared to those able to source capital more cheaply.

3. Literature Review

Numerous studies have examined the effectiveness of the Capital Asset Pricing Model (CAPM) (Sharpe, 1964; Lintner, 1965) and most have found that for emerging and developing country markets this is subject to considerable ambiguity. More recently, additional factors have been included to provide a more reliable explanation of the cross section of average returns. These include firm size, the book to market equity ratio, the price earnings ratio, the cash flow to price ratio, and the performance of the firm in terms of sales growth (see Shum and Tang (2005) for a full review). One major innovation was proposed by Fama and French (1993) in their three-factor model based on US data, which suggested that asset returns would be related to stock size and market liquidity.

Tests of the CAPM on markets other than those in OECD countries are somewhat limited. Shum and Tang (2006) test common risk factors in assessing returns in Asian stock markets using a sample of assets listed on the Hong Kong, Singapore and Taiwan Stock Exchanges. Their results confirm those of Fama and French (1993) when using contemporaneous market factors, but the augmented model that includes size and book-to-market ratios reports no significant improvement over the traditional CAPM. Only with past values of these variables is there any enhanced accuracy of asset pricing in these markets. Drew and Veerarachavan (2003) test the Fama and French model on Hong Kong, South Korea, Malaysia and the Philippines and find size and value effects can be identified in these markets using a cross-section approach. However, nothing of this kind has been done for African markets, which is surprising given the increased interest in emerging market investment.

This paper incorporates some aspects of the Fama and French method, notably the time series approach and the inclusion of a firm size variable. But it is also the first to incorporate a measure of illiquidity, following Liu (2006), in the specific context of emerging markets. Liquidity is a major factor in explaining asset returns and a number of measures have been suggested. These include the quantity of trades (Datar et al, 1998), the speed of trades (Liu, 2006), the costs of trading (Amihud and Mendelson, 1986) or the impact that a trade has on price (Amihud, 2002; Pastor and Stambaugh, 2003). However, many of these aspects are difficult to capture in emerging markets and this paper

focuses on the fourth of these, the price effect. The market-wide illiquidity factor is constructed following Amihud (2002), and is based on intraday trading volumes and order flows that impact stock prices.

4. The Model

Intuitively, investors in small emerging markets with low levels of development may be attracted to large, well-known companies as these are considered safer investment opportunities with more reliable dividend payouts. These larger blue-chip companies may be the better domestic parastatals and former state-owned enterprises that have been privatised, large privately owned companies or multinationals. All appear to represent profitable investments because investors are confident that they will comply with international corporate governance standards whereas smaller companies would find this more costly to implement. In addition, it is well established that investors implicitly price a liquidity premium into valuations and expected returns, although the literature documenting methods of liquidity premium measurement remains scarce.

Although the literature reports a number of variable constructions to capture or proxy liquidity, there are limitations with each depending on which fundamental trading statistics are used to assess liquidity. Some of these shortcomings originate from an analysis of market micro-structure, some from price determination and others from order flow. The illiquidity measure originally proposed by Amihud (2002) has been used successfully by Martinez et al (2005) to analyse liquidity premiums in pricing models applied to the Spanish stock market and is replicated here. The measure captures the price impact as the response associated with one pound sterling of trading volume. In particular, illiquidity for a given stock on a given day is the ratio of the absolute value of the percentage price change per pound sterling of trading volume. This is similar to measures developed from a market trading volume order flow perspective and defines the illiquidity of stock *j* in month *t* is

$$ILLIQ_{jt} \equiv \frac{1}{D_{jt}} \sum_{d=1}^{D_{jt}} \frac{\left| R_{jdt} \right|}{V_{jdt}} \tag{1}$$

where R_{jdt} and V_{jdt} are the return and pound sterling trading volume on day *d* in month *t* and D_{jt} is the number of days with observations in month *t* of stock *j*. If a particular stock has a high value of $ILLIQ_{jt}$ this indicates that the price moves a lot in response to trading volume and therefore the stock is considered illiquid. The market-wide cross section liquidity risk factor is an aggregation of this measure across all stocks expressed

$$ILLIQ_t \equiv \frac{1}{N_t} \sum_{j=1}^{N_t} ILLIQ_{jt} \tag{2}$$

where N_t is number of stocks available in month *t*.

Martinez et al (2005) state that when this factor increases it can be interpreted as an adverse shock to aggregate liquidity. Stocks that tend to pay lower average returns when this measure

increases (negative betas relative to this factor) do not provide desirable hedging opportunities for investors and therefore extra compensation is required for holding these stocks. This implies that the premium associated with this liquidity factor in a cross section should be negative. Shum and Tang (2005) cite earlier work that suggests smaller market value portfolios produce higher average returns.

Following this reasoning, the three factor model of Fama and French (1993) to capture CAPM average-return anomalies can be adjusted and applied to emerging markets. Thus, in addition to the market excess returns, the model is augmented by the excess returns attributed to size (SMB), and the excess returns attributed to illiquidity (ILLIQ). This restates the three factor CAPM as the expected return on a risky portfolio *p*, in excess of the risk free rate $E(R_p) - R_f$ is a function of (i) excess return on the market portfolio, $R_m - R_f$; (ii) the difference between the return on a portfolio of small-size stocks and of large-size stocks, SMB; and (iii) the difference between the return on a portfolio of high illiquidity stocks and of low illiquidity stocks, ILLIQ. Therefore, the expected excess returns on a portfolio *p* of emerging market stocks can be written as

$$E(R_p) - R_f = \beta_p[E(R_m) - R_f] + S_p E(SMB) + S_p E(ILLIQ) \quad (3)$$

The equilibrium relation of the Fama and French (1993) three factor model is stated in terms of expected returns. In order to test the model with historical data, it is necessary to transform (3) to the following estimating equation:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + S_p SMB_t + H_p ILLIQ_t + \varepsilon_{pt} \quad (4)$$

where the variables are described above and $\varepsilon_{p,t}$ is an iid disturbance term.

5. Data and Methodology

This section contains information about the construction of the data series to be used in the estimated model. The first sub-section explains how the firms were first classified into three portfolios based on market value, from the smallest to the largest. For each size portfolio, the stocks were then sorted into three separate illiquidity-ranked portfolios according to their illiquidity factor values in ascending order. This resulted in nine size-illiquidity portfolios. The second sub-section presents the descriptive statistics for each of these nine size-illiquidity portfolios. The third sub-section presents the average market illiquidity factors by country. The final sub-section explains the estimation methodology.

5.1 Data Sources and Series Construction

The values of the daily total returns are from Datastream for each stock included in the market indices for South Africa, Kenya, Egypt and Morocco and for the London FTSE100 index. These were supplemented with daily stock prices and trading volumes to generate liquidity factors. These measures are used to sort stocks into portfolios, following Amihud (2002).

All data series were converted to sterling in order to present the UK and international investor perspective. This also removes the effects of high and volatile local currency premiums in the calculation of excess returns. The exchange rate data are from Datastream, Bloomberg and the South African Reserve Bank. The one-month UK-Gilt/Treasury Bill yield rate represents the risk free rate although this is adjusted to take account of monthly excess returns as opposed to the quoted equivalent annualised rates. The conversion of the total returns series and prices into sterling and the use of UK-Gilt/Treasury yield rate assumes long term parity between individual domestic currencies and sterling. The UK- Gilt/Treasury yield data are also from Datastream.

A critical factor in the portfolio sorting is that all information is known in the year preceding the annual stock sorting and portfolio rebalancing at end of December in each year. The size factor is simply the value of each stock's market capitalisation in December of each year, calculated as the product of the shares outstanding and the sterling price per share for all countries. In addition, since the Amihud (2002) liquidity factor depends on the positive modulus of stock price returns to assess the sterling traded impact on price, the absolute value of the returns is used. Stock price returns are calculated on a daily basis and then divided by daily sterling trading volumes and the mean of this factor for each month is calculated creating monthly values of the Illiquidity factor for each stock. Because the markets in this sample include some of the most illiquid stocks in the world and have highly variable illiquidity factor profiles, the mean of all the monthly illiquidity values is taken to represent the annual aggregated average of the illiquidity factor in the end of year portfolio sorting. It is necessary to be cautious in interpreting the monthly time series of the Amihud (2002) illiquidity factors for these markets, and also for some of the individual stocks. These markets contain a considerable cross-sectional variation in stocks and frequency of trading and because of exceptionally low frequencies, the calculation to generate this factor treats chronically illiquid periods as periods of zero values. This illiquidity measure can reflect the very low levels for highly liquid stocks, causing a false interpretation. This further justifies the choice of markets compared to others in Africa as many are large but highly illiquid. For example, Nigeria has 271 listed companies but only 10 are traded regularly (Hearn and Piesse, 2008).

For each month *t*, each company *j* is ranked by the market value of equity at the end of December. Then, firms are classified into 3 portfolios based on market value, from the smallest to the largest. For each size portfolio, stocks are further sorted into 3 separate illiquidity ranked portfolios according to their annualised generated illiquidity factor values in ascending order. Nine size-illiquidity portfolios are constructed and are rebalanced annually. The equally weighted monthly returns on portfolios are computed each month from December to the following December. Repeating this procedure for every year results in 143 equally weighted monthly returns from January 1996 to December 2007. In addition to these portfolios rebalanced and sorted to reflect size and illiquidity state factors, four additional equally weighted portfolios are generated for stocks local to each domestic market in the overall sample, resulting in country portfolios for South Africa, Kenya, Egypt,

Morocco and London (FTSE100 stocks). The market excess returns variable is generated as the aggregate average returns each month across each market. Shum and Tang (2005) form a market returns variable from both an equally weighted and a market capitalisation weighted average but in this paper the equally weighted average of returns is used as the market portfolio. This is because London and the JSE dominate all of the African equity markets and therefore a market capitalisation weighted portfolio would impose a high level of bias that reflects the characteristics of these stocks. Equally, other methods commonly used in the literature to determine the market variable, such as a regional investment index proxy, for example, the Standard & Poor's or MSCI range of indices, are complicated by the lack of benchmarks for Sub-Saharan Africa.

The monthly size factor (SMB) is the difference between the average returns on the three small stock portfolios and the average returns on the three big stock portfolios. The monthly liquidity factor (ILLIQ) is the difference between the average returns on the three high-illiquidity portfolios and the average returns on the three low-illiquidity portfolios.

5.2 Descriptive Statistics

Descriptive statistics for all nine size-illiquidity factor sorted portfolios and the zero-cost SMB and ILLIQ portfolios are in Table 1. The average mean returns increase considerably from large to small size stock portfolios. This is also reflected in the measure of volatility, where standard deviations increase dramatically from larger size firm to smaller size firm portfolios. Average returns in small size stock portfolios tend to be more risky than in larger stock portfolios, but also have higher potential returns. However the negative value of the mean of the SMB indicates the likelihood of a reverse size effect from that in Fama and French (1993) where returns steadily decrease as stock size increases. Although there is little difference between the cross section of low to high liquidity portfolio means, there is an increase in volatility from low illiquidity to high illiquidity stock portfolios. Even in a less liquid market this result is expected since the impact of sudden erratic order flow on stock prices reflects significant adjustments in value where there is occasional trading activity. It is harder to interpret the coefficient of variation as the average return means are close to zero, which makes the value very large. However, the coefficient of variation tends to be larger for larger size stock portfolios than small size stock portfolios, confirming the results for South East Asian markets in Shum and Tang (2005). This result is further highlighted by the exceptionally high coefficient of variation for the market portfolio of the Kenyan Alternative Investment Market (AIMS), compared to the main market. The AIMS market was established for smaller companies that are unable to meet the criteria of the main listings board and tend to have shorter histories with less investment information and analyst coverage. The UK has the lowest coefficient of variation and the lowest average mean return, with the exception of the Kenyan AIMS market, as well as the lowest standard deviation. This is not surprising as emerging and frontier markets are subject to higher risk.

Table 1

Table 2 reports the results of the annual average number of stocks in the monthly portfolios for the nine size-illiquidity constructed portfolios. Although there has been a net increase in the number of companies within each size/liquidity sorted portfolios indicating some degree of survivor bias, failed and de-listed company data are included in the calculation, subject to monthly and annual sorting for their ultimate removal. Table 3 provides a more detailed breakdown of the home country of the companies contained within the size-illiquidity sorted portfolios in Table 2. Almost without exception the companies listed in the UK and South Africa dominate the large size portfolios. Furthermore, the UK companies are primarily part of the large size, low illiquidity portfolio while South African companies tend to be concentrated in large size, high illiquidity portfolios. There is a relatively even mix of the UK and South Africa in the large size, medium illiquidity portfolio. The medium size portfolios are also dominated by South African companies except that significant numbers of Egyptian and Moroccan companies start to appear in the medium size and medium and high illiquidity portfolios. Although there are some Kenyan companies in the medium size, high illiquidity portfolio they appear in earnest in the small size portfolios across all ranges of liquidity within this size bracket. There are also a number of South African and a very small number of Egyptian and Moroccan companies.

Tables 2 and 3

Generally these results are as expected given the advanced level of development of the UK and South African markets and that the top-performing companies in the FTSE 100 index represent the London market. Egypt and Morocco are advanced markets in African terms and have large and well-diversified economies and stock markets that reflect the size and liquidity of the majority of their listed companies. However, Kenya has only a very small formal sector and a relatively large informal one. In contrast to the other markets, Kenya is dominated by smaller, undercapitalized companies that have very limited trading profiles.

5.3 Illiquidity Factors

Figure 1 shows the cross-sectional market aggregate average illiquidity factors. Again, caution is necessary in interpreting these data as market-wide indicators of liquidity because of the sample bias that results from the simple equally-weighted average of individual stocks illiquidity. However, they do highlight the variance in the liquidity profiles of the markets and reflect the differences in institutional, regulatory and macroeconomic environments in this group of emerging markets. The Amihud (2002) liquidity measures used have been multiplied by 1 million for purposes of comparison.

Figure 1

All markets are characterised by very large spikes in the data. A small period of illiquidity for South Africa around the beginning of 2000 reflects the general downturn in developed country financial markets that led fund managers to transfer holdings out of emerging markets to less risky investment. This followed the 1997 Asian currency crisis, the 1998 Russian debt crisis, and the 2000/

2001 depreciation of the Rand. Quite different factors influenced the markets in Egypt and Morocco. It would appear that the effects of substantial market reform can be seen in both illiquidity profiles. The effects of improved regulation and institutional infrastructure during the late 1990s and early 2000s appear to be negative in Morocco, given the substantial increase in aggregate market illiquidity. Egypt has a slightly different profile and while levels of aggregate illiquidity are comparable to those of Morocco, illiquidity decreases after 2005. London and Kenya are markedly different from all the others. Illiquidity for London differs from the other countries in the order of 100. Kenya is at the other end of the illiquidity spectrum, with levels that are both high and variable. Interestingly, Kenya is further split into its component markets. The overall and AIMS markets have relatively stable profiles with only a gradual increase in illiquidity from the late 1990s to 2003, which can be attributed to the general loss of value and stagnation of the Kenyan stock exchange during this period. However, the size and variety of companies in the main market and the aggregate levels of illiquidity are both higher and more variable compared to the other two markets.

5.4 Estimation Methodology

Prior to estimation, time series diagnostic tests were done to check for autocorrelation and heteroskedasticity, given the sensitivity of the disturbance terms to normality assumptions in the distribution properties of the data. Then, nine time-series regressions were estimated, one for each of the nine size-illiquidity portfolios. In addition, pooled regressions were estimated for individual aggregate country portfolios for each of the four markets. Tests for heteroskedasticity using the White test (White, 1980) and the Durbin-Watson test (Durbin and Watson, 1950 and 1951) for autocorrelation found significant heteroskedasticity and autocorrelation. These test results are not reported here but suggest the t-tests in the OLS regressions are unreliable. Newey and West (1987) methods were used and the tests repeated. It should be noted that this adjusts the standard errors but not the regression estimates.

6. Empirical Results

Table 4 reports the results from the grouped pooled regression on all nine size-illiquidity sorted portfolios. As expected from the model, the Jensen alpha, α_p, is not significantly different from zero in all cases with the exception of the large-size, medium-liquidity portfolio. This indicates that there is little segmentation between the various portfolios representing the size/liquidity characteristics of the overall market. The estimated coefficients on both the market excess return (β_p) and the illiquidity factor (H_p) are large and significant in almost all cases. Those on the size factor-mimicking portfolio (S_p) are smaller in the majority of cases and are only significantly different from zero in the large or small-size company portfolios. The medium-size portfolios are insignificant. Thus, size is only relevant in valuation when handling either small or large companies and is insignificant for medium-size companies. The coefficients on the small-size portfolios are negative as well as being highly

significant, while those on the large-size portfolios are positive and highly significant. The negative sign on the small-size portfolio betas indicates that small firms' returns decrease when the size premium increases, which is opposite for the large-size firms. This behaviour is not expected and demonstrates that different valuation techniques should be used on small firms. It is also a feature of an extremely heterogeneous universe of stocks, where there are considerable differences between the firms that comprise the FTSE100 index and those listed on the much smaller and highly illiquid markets of Kenya, Egypt and much of South Africa.

The estimated coefficients on the illiquidity factor-mimicking portfolios tend to be larger than those of the size-mimicking portfolios and the level of significance is also varied. That is, the coefficients attributed to the high and low illiquidity portfolios are highly significant while those attributed to the medium-illiquidity portfolios have only marginal significance. In general, the coefficients on the low-illiquidity and medium-illiquidity portfolios are negative, as one would expect, with firms paying lower returns when the illiquidity variable increases. However, the coefficients on the high-illiquidity portfolios are positive indicating that these companies pay higher returns when the illiquidity measure increases. This is the opposite of what would be expected and does not provide investors with good hedging opportunities. Thus, as with the results for the small-size portfolios, a different valuation method would be needed to price very high illiquidity stocks and firms accurately. The absolute size of the coefficients on the illiquidity factor also tend to be larger with respect to either the smaller or larger size portfolios than medium size ones providing further evidence of the illiquidity relationship to company size. The increased explanatory power of these models illustrates that the augmented CAPM is appropriate for highly illiquid markets.

This is a very important result in the context of emerging markets, as the vast majority of research on the original of Sharpe (1964) and Lintner (1965) is confined to developed markets. In the Table, the first adjusted R^2 [Adj R^2 (1)] is the result from regressing the expected return on risky portfolio p, in excess of the risk free rate $E(R_p) - R_f$ as a function of the excess return on the market portfolio, $R_m - R_f$. The second adjusted R^2 [Adj R^2 (3)] is the result from regressing the size and illiquidity augmented three-factor model on excess returns. In all size and illiquidity groups there is substantial improvement, in many cases by more than 100%. This provides further evidence that in a broad, market-wide context that considers stocks from all countries in this sample, the model has a good fit and the size and illiquidity factors are significant across the entire group.

Table 4

Table 5 reports estimates of the cost of equity calculated from the expected returns from each country regression. It should be noted that the market portfolio used is restricted to a sample of largely small and illiquid African markets, composed of very small and volatile firms and consequently London is the only market that is truly liquid and comprised of large firms with a low

cost of equity. In contrast, the high cost of equity for the Africa markets is used as the discount factor and applied to future cash flows in project valuation.

Table 5

6.1 Average Returns in the London Market

The London market is represented by the FTSE100 index. Companies follow the code of corporate governance stipulated by the Cadbury Report and Sarbanes-Oxley, which requires independent audit and timely reporting. They also have sophisticated investor relations and communication mechanisms in place to ensure that information is incorporated into market prices. Because of the high fixed costs involved in listing and compliance, only the largest, best performing and most heavily capitalised companies are included but benefit from low costs of equity. This is reflected in the absolute size of the coefficients in the UK portfolio in Table 6. In contrast to the other emerging markets, all coefficients are significantly different from zero, including Jensen alpha, α_p. However, the absolute sizes of these coefficients in relation to the other markets are much smaller. The adjusted R^2 indicates that the model containing premiums from all three factors, market, size and illiquidity, explains over 65% of the variance. However the presence of a significant Jensen alpha, α_p indicates some degree of segmentation between the London market and Africa, which is expected. Given the London market is a global leader, the cost of equity is the lowest of this sample at 9.73%. Given the selection of countries included in the market portfolio the London market is expected to have an extremely low cost of equity value. Clearly, the London listed firms are distinct from the rest of the sample. The cost of equity is calculated from the annualised combination of the total risk premium, which is the sum of market, size and illiquidity premiums, with the 1 month UK Treasury rate a proxy for the risk free rate. This low cost of equity is also responsible for the recent migration of primary listings of major multinational enterprises such as Anglo American and Old Mutual from South Africa to London.

Table 6

6.2 Average Returns in the South African Market

The market premium is the only variable with an estimated coefficient significantly different from zero. The size and illiquidity coefficients are both very small and statistically insignificant while the simple model including only the market premium has the highest adjusted R^2 of 0.8594. The estimated coefficient on the market premium is large and significant and the adjusted R^2 is 0.859. This is partly due to the number of companies in this market (270), representing half of the total sample. As shown in Table 5, the cost of equity is 30.75%, which is the highest in the sample and largely due to the market being highly skewed. The South African market has a majority of smaller, illiquid and more volatile firms, which affect the aggregate beta estimates. In addition, the Jensen alpha, α_p is insignificant, implying a higher level of integration between South Africa and the other African

markets. This suggests that the South African market does provide a promising location for other African market participants to raise project finance.

6.3 Average Returns in the Egyptian Market

All three variables are significantly different from zero in this market and have some the largest coefficients in absolute terms. However, the adjusted R^2 is small (0.3089). As shown in Table 5, the cost of equity for this market is 24.13%, the highest in North Africa and second to Kenya and the aggregate value for South Africa in this sample. This would place Egyptian companies wishing to raise finance for expansion and international projects and expansion at a distinct disadvantage. It also suggests that the market is uncompetitive in terms of sourcing new equity capital compared to other nearby exchanges in both the Middle East and Europe.

6.4 Average Returns in the Moroccan Market

Only the market premium is significant in this market. The explanatory power of the model is very low, with an adjusted R^2 at 0.1030, and that the Jensen alpha, α_p, is only marginally insignificant. However, the cost of equity is low at 9.91%, as shown (Table 5). Morocco has the most advanced level of market institutional development and corporate governance in North Africa and it is interesting to note that North African markets (Algeria, Tunisia and Morocco), all have French civil commercial legal codes and the regulatory systems are based on the French model. In addition, securities markets tend to be less developed compared with the banking system. In 2007, only 5% of business finance was raised on the Tunisian Stock Exchange, with the overwhelming majority obtained through bank loans (Bourse de Tunis, 2008). Thus, estimation of the cost of equity and cost of capital for these countries may fail to include many variables that are relevant to the structure of their financial systems.

6.5 Average Returns in the Kenyan Market

As noted above, there are considerable differences between the three component markets in Kenya, as shown in Table 7. The variables modelling the overall market are size and market premium as these have large and significant coefficients. Compared to the other models, the size and market variables have an adjusted R^2 of 0.2137. The size and significance of these two premiums results in a cost of equity for the overall market of 20.12% (Table 5). The Kenyan main Listings Board is quite different and as with AIMS, all three variables are significant. The adjusted R^2 for the main market is 0.1820, while for AIMS it is 0.2103. Despite this slight difference in explanatory power, the significance of the illiquidity premium in the main market differentiates this from the others. The three markets have dramatically different costs of equity, as would be expected in a country that already has lower regulatory and corporate governance standards than others in the sample, and where the AIMS has had to relax even these standards to attract listings from SMEs. The cost of equity for the main market is

18.17% and 28.64% for the AIMS market. Overall, the cost of equity in Kenya is 20.12%. This indicates that Kenyan companies are at a real disadvantage relative to those in the other major African markets. In addition, the very high costs of equity on the AIMS market questions the efficacy of a general policy that is being implemented across Africa of encouraging existing stock exchanges to extend present activities to smaller undercapitalised companies from the SME sector.

7. Conclusions

This paper proposes a size and liquidity-augmented capital asset pricing model specifically focussing on emerging markets, which have previously been excluded from empirical CAPM research. Four large African markets are used in addition to London. The African markets are the large and well-regulated Johannesburg Stock Exchange, the smaller regional hub North African markets of Egypt and Morocco and the much smaller and less active eastern hub market in Nairobi. The Kenyan market is split into two components, the main listings and the Alternative Investment Market. Illiquidity series were constructed on a time-series cross-section basis and augment the Fama French (1993) risk-adjusted CAPM.

The results show that this model is superior to the Sharpe/Linter CAPM and in line with the Fama and French models, as illiquidity is both a priced and consistent characteristic in these emerging markets. In all countries, the market risk premium and the premiums attributed to size factor and illiquidity are important factors in pricing asset returns, although the premium associated with size has a greater impact on overall explanatory power than that associated with illiquidity. The only anomalies found with the model are those frequently encountered in modelling very small firms. Firstly, these affect the betas in terms of their being more illiquid and consequently having greater returns volatility. This is largely responsible for the well regulated South African market having the highest cost of equity for Africa as a whole because that market is overwhelmingly dominated by small and illiquid firms. Secondly, returns decrease when the size premium increases, and in very high illiquidity firms returns increase when the illiquidity premium increases. However, the most striking differences between all the sample countries are in the dramatic variation in the costs of equity. Not surprisingly, London has the lowest cost of equity, which has already encouraged prominent South African firms to migrate their primary listings from Johannesburg to London. Morocco has the next highest cost of equity, being only slightly higher than London and reflecting the level of development in that market. There is a considerable increase in the cost of equity in Egypt and in Kenya. The Kenyan market itself exhibits a substantial differential of over ten percent in the cost of equity between the main listings board and the AIMS market. This suggests that companies in Kenya are only able to access equity finance at a distinct disadvantage to other locations and also that the development policy of established stock exchanges that aims to attract the SME sector is seriously flawed. The uncompetitive nature of AIMS markets as a source of finance for SMEs is particularly evident when compared to funds raised from the banking sector. The banking sector dominates in

many African economies where longer term relationship-based monitoring and surveillance of company performance does allow firms to achieve lower costs of financing.

The high costs of equity faced by indigenous African companies seeking to raise domestic finance places a restrictive burden on their ability to finance international expansion and overseas projects. Furthermore, the expense of meeting the much more stringent corporate governance and regulatory requirements of developed markets such as London, including regular auditing and disclosure, means that African companies are forced to raise finance on local markets where the cost of equity is substantially higher. These firms are at a distinct competitive disadvantage. Profit margins have to be considerably higher than competitors in order to break even given the higher cost of equity. This suggests there should be a shift in focus of existing development policy from the rapid development of AIMS markets within exchanges that already suffer from high costs of equity and asymmetric information, towards facilitating access of much needed capital from the more established SME financial markets within South Africa and London. This could be accompanied by a two-tier system of regulation, similar to the bifurcated system of listings requirements and regulation in US markets for overseas listings. Firms from countries with prohibitively high costs of equity would gain from the exposure of a listing in South Africa or London without the high costs of compliance.

For international investors there is considerable evidence of segmentation amongst the African emerging markets highlighted by the very different risk premiums and costs of equity. This suggests that investment in these markets would be subject to high and variable levels of transactions costs. Investor information search and verification costs are substantial where there are poor corporate governance regimes and incomplete regulation. However, considerable benefits can be achieved by explicitly incorporating size and liquidity premiums into models that would capture the nuances of these markets and facilitate equity portfolio investment and FDI through stakes in listed equities.

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Table 1: Summary statistics for equally weighted monthly excess returns on 9 portfolios formed on size and illiquidity for period 1996 to 2007

	Illiquidity										Zero-cost Portfolios	
Size	High	Medium	Low	High	Medium	Low	High	Medium	Low		**SMB**	**ILLIQ**
	Mean			Standard Deviation (SD)			Coefficient of Variation (CV)					
Panel A: Summary Statistics for portfolios during sample period: 1996 – 2001												
Big	0.0090	0.0112	0.0069	0.0611	0.0485	0.0437	6.77	4.33	6.35	**Mean**	-0.0115	-0.0031
Medium	0.0095	0.0147	0.0152	0.0467	0.0659	0.0621	4.90	4.48	4.09	**SD**	0.0401	0.0287
Small	0.0164	0.0234	0.0222	0.0561	0.0645	0.0629	3.43	2.76	2.84	**CV**	-3.48	-9.39
Panel B: Summary Statistics for countries during sample period: 1996 – 2001												
		Mean			Standard Deviation (SD)			Coefficient of Variation (CV)				
Egypt		0.0134			0.0783			5.86				
Morocco		0.0087			0.0403			4.64				
Kenya		0.0147			0.0607			4.13				
Kenya Main		0.0158			0.0654			4.14				
Kenya AIMS		0.0087			0.0930			10.63				
South Africa		0.0172			0.0732			4.26				
UK		0.0119			0.0382			3.20				

Notes:

For each year, t, every company is ranked by its market capitalisation of equity and the end of December. Stocks are then classified into 3 portfolios based on market value, from the smallest to the largest. For each size portfolio, stocks are further sorted into 3 Illiquidity portfolios based on individual stocks Illiquidity ranking in ascending order. Nine size-illiquidity portfolios are so formed and rebalanced annually. The equally weighted monthly returns on portfolios are computed each month from January to the following December. Repeating this procedure for every year results in an overall sample set of 143 equally weighted monthly returns from January 1996 to December 2007. Additionally for each sample time period two zero cost portfolios, SMB(ILLIQ) representing long small size (high illiquidity) portfolios and short large size (low illiquidity) portfolios. The Kenya Main and AIMS markets are subsets of the overall Kenya market portfolio. The AIMS market is for local SME companies (mostly Tea and Coffee exporting companies) and has a persistent 8 listings for the duration of sample period.

Table 2: Average number of stocks in each of the nine size-illiquidity portfolios by year in period: 1991-2007

Year*	Portfolio 1 **B/H**	Portfolio 2 **B/M**	Portfolio 3 **B/L**	Portfolio 4 **M/H**	Portfolio 5 **M/M**	Portfolio 6 **M/L**	Portfolio 7 **S/H**	Portfolio 8 **S/M**	Portfolio 9 **S/L**
1996	27.75	35.42	48.75	32.08	38.17	39.83	47.25	37.25	41.83
1997	48.08	44.75	46.75	49.75	44.00	43.42	48.42	43.83	42.08
1998	47.33	53.67	52.25	46.67	52.00	46.33	49.75	50.25	45.00
1999	41.58	56.00	56.42	75.17	50.50	48.17	49.33	57.92	55.58
2000	46.08	58.75	58.58	56.00	60.00	58.50	54.92	58.92	54.08
2001	54.00	59.00	58.25	60.00	57.75	55.58	58.00	58.00	55.00
2002	56.00	59.75	58.00	59.83	59.00	56.75	59.00	58.67	52.42
2003	59.00	59.75	56.42	60.00	59.00	57.08	59.00	59.00	50.50
2004	63.00	58.25	53.00	60.00	58.42	57.00	59.00	58.42	48.25
2005	69.00	59.08	52.42	59.83	58.42	58.00	58.42	59.00	48.00
2006	59.17	61.42	61.17	60.00	60.92	61.33	56.00	60.00	55.00
2007	63.00	62.00	57.00	65.00	62.00	60.00	59.00	63.42	49.83

Notes

*Annual rebalancing takes place annually every December

**where B, M, S delineate Big, Medium and Small size and H, M, L delineate High, Medium and Low illiquidity terms

Table 3: Average number of sticks in each of the nine size-liquidity portfolios sorted by nationality by year in period: 1996-2007

Year	Portfolio 1: **B/H**					Portfolio 2: **B/M**					Portfolio 3: **B/L**				
	Kenya	S.Africa	UK	Morocco	Egypt	Kenya	S.Africa	UK	Morocco	Egypt	Kenya	S.Africa	UK	Morocco	Egypt
Mean 1996		21.5		4.8	2.0		4.9	29.0		2.0		11.0	36.8	1.0	
Mean 1997		30.0	1.0	10.0	8.0		6.1	38.0				13.0	33.0	1.0	
Mean 1998		30.0	1.0	13.0	7.0		18.0	34.0		3.0		10.0	42.0	1.0	
Mean 1999		27.0		11.0	5.0		28.0	25.0	2.0	1.0		2.0	53.0	1.0	
Mean 2000	1.0	27.0	1.0	12.0	6.0		31.0	29.0				4.0	52.0	2.0	1.0
Mean 2001	1.0	37.0	2.0	11.0	4.0		23.0	36.0				3.0	50.0	4.0	1.0
Mean 2002		41.0	1.0	11.0	3.0		22.0	37.0				2.0	51.0	4.0	
Mean 2003	1.0	45.0	1.0	11.0	1.0		20.0	39.0				1.0	53.0	3.0	
Mean 2004	2.0	49.0	1.0	9.0	1.0		14.0	45.0				3.0	48.0	2.0	
Mean 2005	2.0	51.0	1.0	9.0	5.0		11.0	48.0				2.0	47.0	3.0	
Mean 2006		12.0	46.0	1.0			13.0	47.0	1.0		2.0	36.0	8.0	9.0	6.0
Mean 2007	1.0	44.0	1.0	10.0	6.0		15.0	46.0			1.0	1.0	53.0	1.0	
	Portfolio 4: **M/H**					Portfolio 5: **M/M**					Portfolio 6: **M/L**				
Mean 1996	3.0	13.2		10.4	4.8	7.0	21.0		5.0	3.8	1.0	24.4	8.0	2.0	2.7
Mean 1997	8.0	12.0		17.0	13.0	4.0	27.0			15.0	1.0	31.0		2.0	4.0
Mean 1998	8.0	15.0		16.0	9.0	6.0	39.0		3.0	12.0	2.0	37.0	6.0	2.0	7.0
Mean 1999	8.0	36.0		21.0	11.0	5.0	32.0			13.0		35.0	7.0	2.0	6.0
Mean 2000	3.0	20.0		18.0	15.0	7.0	41.0			10.0	2.0	45.0		7.0	5.0
Mean 2001	5.0	24.0		17.0	14.0	4.0	40.0		1.0	13.0	4.0	43.0		6.0	5.0
Mean 2002	5.0	20.0		19.0	16.0	6.0	40.0			12.0	4.0	43.0	1.0	5.0	7.0
Mean 2003	4.0	24.0		16.0	16.0	10.0	37.0			11.0	6.0	38.0		7.0	7.0
Mean 2004	8.0	27.0		18.0	10.0	6.0	40.0		2.0	10.0	4.0	37.0		8.0	7.0
Mean 2005	8.0	30.0		16.0	11.0	6.0	38.0		3.0	11.0	4.0	41.0		7.0	5.0
Mean 2006	4.0	39.0		9.0	7.0	9.0	40.0		6.0	6.0	13.0	29.0		10.0	9.0
Mean 2007	6.0	31.0		19.0	8.0	7.0	45.0			9.0	10.0	35.0		7.0	7.0
	Portfolio 7: **S/H**					Portfolio 8: **S/M**					Portfolio 9: **S/L**				
Mean 1996	18.0	19.4		10.0	1.3	11.7	16.0		3.4	8.3	10.0	28.5	1.0	1.5	2.7
Mean 1997	19.0	17.0		7.0	6.0	16.0	19.0		5.0	7.0	9.0	33.0		1.0	2.0
Mean 1998	17.0	17.0		4.0	11.0	11.0	33.0		7.0	3.0	14.0	34.0		2.0	3.0
Mean 1999	19.0	17.0		4.0	11.0	12.0	37.0		3.0	7.0	15.0	39.0		4.0	2.0
Mean 2000	13.0	26.0		3.0	13.0	16.0	40.0			4.0	17.0	31.0		6.0	3.0
Mean 2001	16.0	27.0		5.0	10.0	13.0	38.0			7.0	17.0	34.0		4.0	3.0
Mean 2002	10.0	32.0		4.0	12.0	17.0	37.0			4.0	19.0	32.0		5.0	2.0
Mean 2003	9.0	31.0		7.0	12.0	16.0	37.0			5.0	15.0	35.0		4.0	4.0
Mean 2004	13.0	28.0		3.0	16.0	12.0	35.0		1.0	10.0	16.0	32.0		6.0	3.0
Mean 2005	10.0	29.0		8.0	12.0	12.0	41.0			5.0	17.0	27.0		6.0	7.0
Mean 2006	4.0	28.0		9.0	15.0	18.0	31.0		6.0	9.0	14.0	36.0		5.0	5.0
Mean 2007	14.0	25.0		10.0	9.0	10.0	42.0			11.0	19.0	25.0		9.0	7.0

Notes: Annual rebalancing takes place annually every December. **where B, M, S delineate Big, Medium and Small size and H, M, L delineate High, Medium and Low illiquidity terms

Table 4: Time series regressions using equally weighted monthly contemporaneous market excess returns for 9 portfolios formed on size and illiquidity for period: 1996 – 2001, for all sample markets.

Size	Low	Medium	High	Low	Medium	High
$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + S_p SMB_t + H_p ILLIQ_t + \varepsilon_{pt}$						
		α_p			$T(\alpha_p)$	
Small	0.00037	0.004160	0.002728	0.148607	1.335663	1.121258
Medium	-0.000177	0.000180	-0.000279	-0.071885	0.075898	-0.131708
Big	0.002302	0.004911	4.81E-05	1.145219	3.280661	0.023909
		β_p			$T(\beta_p)$	
Small	0.946783	0.992304	0.825740	19.04780	16.07111	17.12004
Medium	1.182980	1.273283	0.843022	24.23028	27.01580	20.08005
Big	0.700164	0.903497	1.161165	17.57322	30.44608	29.09481
		S_p			$T(S_p)$	
Small	-0.606995	-0.632988	-0.464874	-10.39481	-8.726361	-8.204153
Medium	0.044047	0.045477	0.000540	0.767944	0.821340	0.010950
Big	0.463087	0.467584	0.364472	9.893519	13.41222	7.773613
		H_p			$T(H_p)$	
Small	-0.935802	0.191560	0.703495	-11.47797	1.891440	8.892193
Medium	-0.319037	0.319624	0.267920	-3.983899	4.134462	3.890604
Big	-0.360859	-0.092776	0.412888	-5.521727	-1.906024	6.307249
		Adj R^2 (1)				
Small	0.504476	0.547837	0.508416			
Medium	0.785720	0.822704	0.722762			
Big	0.503461	0.726986	0.781766			
		Adj R^2 (3)				
Small	0.804031	0.712885	0.768659			
Medium	0.806439	0.839927	0.746452			
Big	0.748225	0.882562	0.866255			

Notes: Newey-West HAC Standard Errors & Covariance, standard errors are used in the t-tests. The Market portfolio is taken as the pooled sample of all stocks in universe. The SMB and ILLIQ factors are generated through the sorting of all stocks into 9 size-illiquidity portfolios. The SMB is generated from the mean of the three large size portfolios minus the mean of the three small size portfolios. Similarly the ILLIQ factor is generated from the mean of the three high illiquidity portfolios less the mean of the three low illiquidity portfolios.

Table 5: Cost of Equity estimates

	Cost of Equity*
Cost of Equity (or Expected Return) = R_{ft} + Total Risk Premium	
London (FTSE100)	9.73%
South Africa	30.75%
Egypt	24.13%
Morocco	9.91%
Kenya overall	20.12%
Kenya MAIN Market	18.17%
Kenya AIMS Market	28.64%

Notes: Cost of equity estimates calculated as at 12/2007 and assumes an annualized risk free UK Gilt rate
*Estimates of cost of equity reported in annualized percentage (%) values

Table 6: Pooled cross-section regression for equally weighted monthly excess returns on country portfolios with size and illiquidity for period 1996 to 2007

Explanatory Variables	α_p	$T(\alpha_p)$	β	$T(\beta)$	S	T(S)	H	T(H)	Adj R^2
$R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + S_p SMB_t + H_p ILLIQ_t + \varepsilon_{pt}$									
Panel 1: London (FTSE100 constituents)									
Excess Market alone	0.004757	2.014258	0.570372	11.68821					0.486745
Excess Market and SMB	0.009040	4.490458	0.586246	14.56668	0.388926	8.261210			0.651694
Excess Market and ILLIQ	0.004152	1.775222	0.573530	11.93522			-0.185088	-2.356518	0.502691
***All Three Factors**	**0.008499**	**4.233444**	**0.588169**	**14.77789**	**0.379746**	**8.121586**	**-0.134597**	**-2.061729**	**0.659543**
Panel 2: South Africa									
***Excess Market alone**	**-0.001085**	**-0.457811**	**1.449113**	**29.58918**					**0.859462**
Excess Market and SMB	-0.000888	-0.360719	1.449845	29.47618	0.017924	0.311514			0.858563
Excess Market and ILLIQ	-0.001122	-0.468969	1.449307	29.47935			-0.011344	-0.141173	0.858485
All Three Factors	-0.000924	-0.370966	1.449974	29.36734	0.017307	0.298377	-0.009043	-0.111663	0.857565
Panel 3: Egypt									
Excess Market alone	0.002929	0.497058	0.827498	6.795276					0.240072
Excess Market and SMB	-0.002147	-0.364525	0.808686	6.867187	-0.460887	-3.345715			0.290972
Excess Market and ILLIQ	0.004464	0.765509	0.819483	6.838434			0.469693	2.398001	0.264672
***All Three Factors**	**-0.000491**	**-0.083618**	**0.802800**	**6.903434**	**-0.432776**	**-3.167797**	**0.412151**	**2.160729**	**0.308952**
Panel 4: Morocco									
***Excess Market alone**	**0.005096**	**1.547088**	**0.284184**	**4.174943**					**0.103055**
Excess Market and SMB	0.004107	1.205978	0.280519	4.120333	-0.089772	-1.127211			0.104761
Excess Market and ILLIQ	0.005287	1.591316	0.283186	4.148032			0.058458	0.523883	0.098449
All Three Factors	0.004296	1.246909	0.279849	4.097327	-0.086570	-1.078896	0.046948	0.419063	0.099497

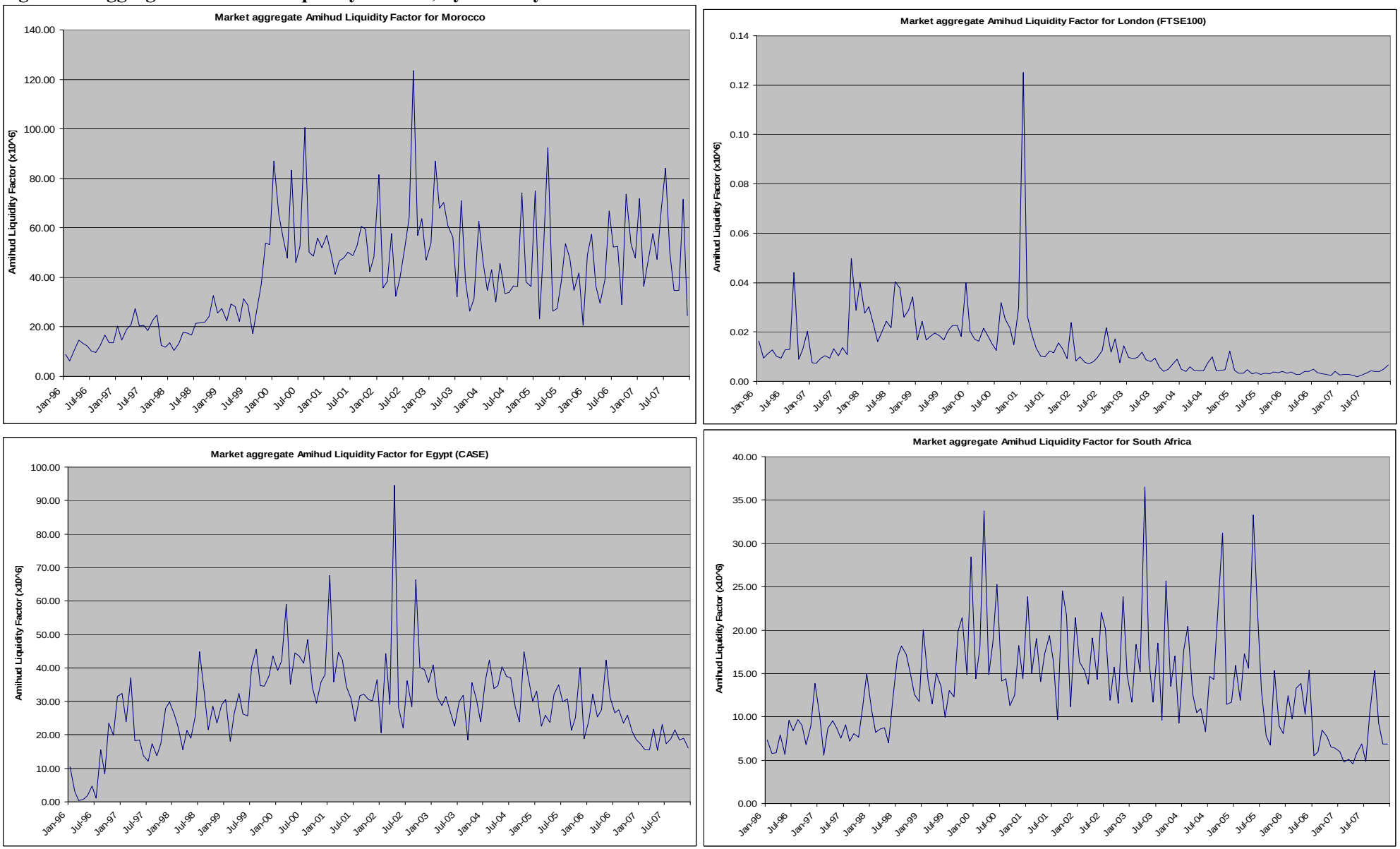
Notes:
Newey-West HAC Standard Errors & Covariance, standard errors are used in the t-tests
* indicates models selected from which Cost of Equity are estimated
The Market portfolio is taken as the pooled sample of all stocks. The SMB and ILLIQ factors are generated through the sorting of all stocks into 9 size-illiquidity portfolios. The SMB is generated from the mean of the three large size portfolios minus the mean of the three small size portfolios. Similarly the ILLIQ factor is generated from the mean of the three high illiquidity portfolios less the mean of the three low illiquidity portfolios.

Table 7: Pooled cross-section regression for equally weighted monthly excess returns on country portfolios with size and illiquidity for Kenya

Explanatory Variables	α_p	$T(\alpha_p)$	β	$T(\beta)$	S	T(S)	H	T(H)	Adj R^2
$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + S_p SMB_t + H_p ILLIQ_t + \varepsilon_{pt}$									
Panel 1: Kenya overall									
Excess Market alone	0.009172	1.853038	0.436925	4.271496					0.107620
***Excess Market and SMB**	**0.003610**	**0.750691**	**0.416311**	**4.331108**	**-0.505033**	**-4.491551**			**0.213782**
Excess Market and ILLIQ	0.009676	1.941931	0.434296	4.241864			0.154080	0.920736	0.106662
All Three Factors	0.003962	0.814956	0.415059	4.306283	-0.499050	-4.407310	0.087726	0.554892	0.209904
Panel 2: Kenya MAIN Market									
Excess Market alone	0.010357	1.922636	0.429614	3.859438					0.088564
Excess Market and SMB	0.004970	0.935943	0.409652	3.859182	-0.489056	-3.938532			0.173074
Excess Market and ILLIQ	0.011466	2.134556	0.423823	3.839806			0.339395	1.881264	0.104575
***All Three Factors**	**0.006083**	**1.141977**	**0.405699**	**3.841900**	**-0.470172**	**-3.789970**	**0.276881**	**1.598537**	**0.182096**
Panel 3: Kenya AIMS Market									
Excess Market alone	0.002691	0.344297	0.480130	2.972741					0.051958
Excess Market and SMB	-0.004007	-0.512706	0.455308	2.913974	-0.608136	-3.327190			0.114738
Excess Market and ILLIQ	-0.000379	-0.050313	0.496155	3.206028			-0.939147	-3.712805	0.130264
***All Three Factors**	**-0.008145**	**-1.093940**	**0.470007**	**3.184098**	**-0.678343**	**-3.911726**	**-1.029340**	**-4.251355**	**0.210358**

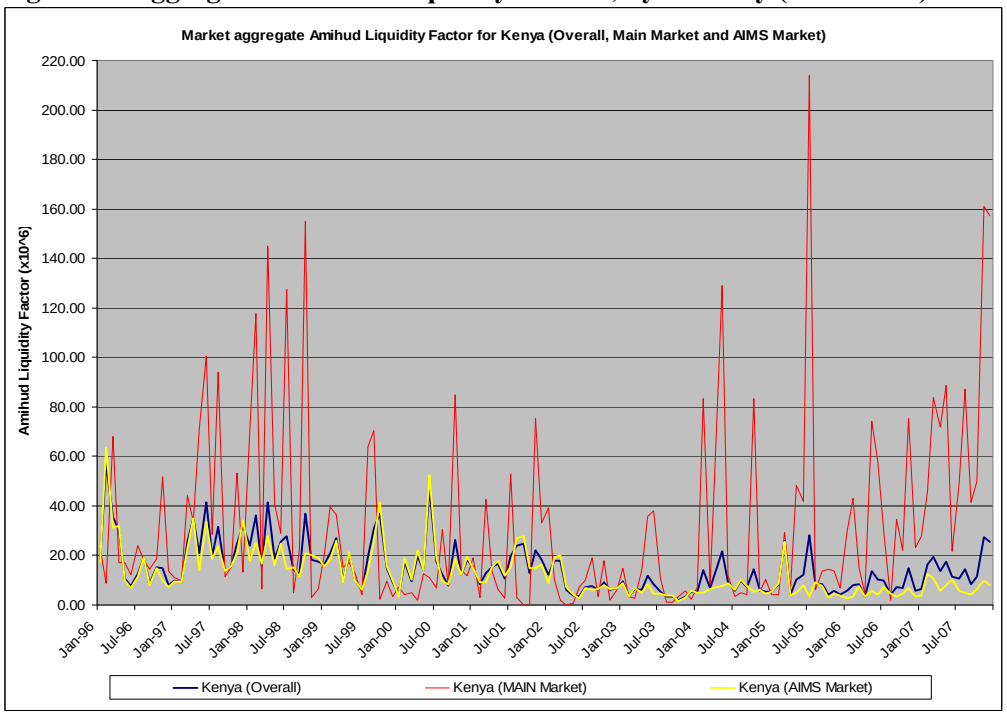
Notes:
Newey-West HAC Standard Errors & Covariance, standard errors are used in the t-tests
* indicates models selected from which Cost of Equity are estimated
The Market portfolio is taken as the pooled sample of all stocks. The SMB and ILLIQ factors are generated through the sorting of all stocks into 9 size-illiquidity portfolios. The SMB is generated from the mean of the three large size portfolios minus the mean of the three small size portfolios. Similarly the ILLIQ factor is generated from the mean of the three high illiquidity portfolios less the mean of the three low illiquidity portfolios.

Figure 1: Aggregated Market Illiquidity Factors, by Country



Illiquidity factors constructed according to Amihud (2002) techniques outlined in equations (1) and (2). Larger absolute values are interpreted as higher levels of aggregate illiquidity (lower levels of liquidity

Figure 1: Aggregated Market Illiquidity Factors, by Country (Continued)



Illiquidity factors constructed according to Amihud (2002) techniques outlined in equations (1) and (2). Larger absolute values are interpreted as higher levels of aggregate illiquidity (lower levels of liquidity

[1] The King Report that regulates corporate governance practices in South Africa is very similar to the UK Cadbury Report and the US Sarbanes-Oxley Act.
[2] Countries in the East African Community are Kenya, Tanzania and Uganda.
[3] That is shares available to the public.