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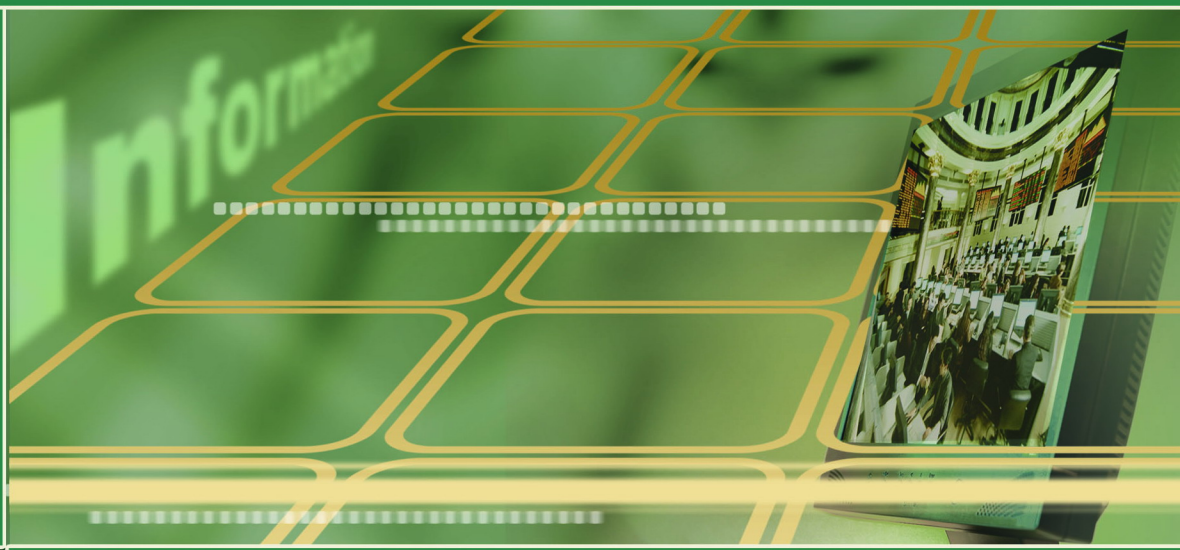

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Market Liquidity and Stock Size Premia in Emerging Financial Markets: The Implications for Foreign Investment

Bruce Hearn[a,1], Jenifer Piesse[b,2] and Roger Strange[c,3]

[a] Department of Management, King's College London, 150 Stamford St, London SE1 9NH and Sir John Cass Business School, 106 Bunhill Row, London EC1Y 8TZ
Email: bruce.hearn@kcl.ac.uk

[b] Department of Management, King's College London, 150 Stamford St, London SE1 9NH and University of Stellenbosch, South Africa
Email: jenifer.piesse@kcl.ac.uk

[c] Department of Management, King's College London, 150 Stamford St, London SE1 9NH
Email: roger.strange@kcl.ac.uk

Abstract

Equity markets are increasingly seen as important sources of investment funds in many emerging economies, both in Africa and elsewhere. Furthermore, many countries perceive the development of such markets as a means to facilitate both foreign equity portfolio investment and foreign direct investment (FDI) through the acquisition of shareholdings in domestic companies, and thus supplement the low levels of funding from domestic savings. But many emerging stock markets exhibit substantial risk premia, which both push up the cost of equity for listed domestic firms and deter potential foreign investors. This paper estimates the cost of equity in four major African markets: South Africa, Kenya, Egypt and Morocco. These collectively represent the largest and most developed equity markets in Africa and also act as hub markets in their respective regions. London is also included as a link between the emerging and developed financial market. 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 between the large international market of London and the smaller but well regulated Moroccan market, while Egypt has a higher cost of equity. The small developing market of Kenya has the second highest cost of equity, although the costs associated with the main market are less than ten percent of that faced by companies in the fledgling Alternative Investment Market. South Africa has the highest cost of equity although this reflects a proliferation of smaller firms in this market.

JEL classification: G12, G15, O16

Keywords: Africa, Capital Asset Pricing Model, Liquidity, Emerging Financial Markets

نبذة

تزداد أهمية سوق الأسهم كمصدر رئيسى لتمويل الاستثمارات فى اقتصاديات الأسواق الناشئة فى أفريقيا وغيرها، حيث ترى العديد من ترى فى تطور أسواق المال وسيلة هامة لجذب الاستثمارات الأجنبية فى الحافظة عوضاً عن الاستثمار الأجنبي المباشر (FDI) من خلال الاستحواذ على شركات محلية من خلال سوق المال، وهو ما يعد بديلاً أو مكملاً للمستويات المنخفضة من الادخار المحلى. لكن فى الوقت ذاته فإن العديد من الأسواق الناشئة تعانى من علاوة مخاطرة عالية والتى تزيد من تكلفة الأسهم للشركات المقيدة وتعيق الاستثمارات الأجنبية المحتملة.

وتعنى هذه الورقة بتقدير تكلفة الأسهم فى أربع دول أفريقية كبرى وهى جنوب أفريقيا ومصر وكينيا والمغرب، وهى تمثل مجتمعة أكبر أسواق المال فى القارة الأفريقية وأكثرها تطوراً، وأيضا تمثل تلك الأسواق بوابة للتمويل فى منطقتهم، وقد تم تضمين سوق لندن أيضاً كوسيلة اتصال بين الأسواق المالية الناشئة والمتقدمة.

وقد أخذ (Fama& French 1993) فى الاعتبار فى نموذج تسعير اصل راس المال **(CAPM)** ثلاثى العوامل عاملى حجم الشركة وسيولتها والتى تميز الأسواق الأفريقية، وكانت النتائج أن العلاوة المرتبطة بحجم الشركة تتفوق على تلك المرتبطة السيولة، بالرغم من الأهمية البالغة لكلاهما فى التقييم وتقدير تكلفة الأسهم.

وأوضحت النتائج أن أقل تكلفة للأسهم قد تحققت بين سوق لندن المتقدم والسوق المغربى صغير الحجم المنظم جيدا، بينما تبدو تكلفة الأسهم فى حالة السوق المصرى أعلى.

وقد حصل سوق كينيا النامى على ثانى أكبر تكلفة للأسهم بالرغم من أن التكلفة المرتبطة بالسوق الرئيسى اقل من 10% من تكلفة الشركات فى سوق الشركات الناشئة (Aim) ببورصة لندن، بينما سجلت جنوب أفريقيا أعلى تكلفة للأسهم بالرغم من أن هذا يعكس زيادة الشركات الأصغر فى السوق.

الكلمات الدالة: أفريقيا، نموذج تقييم أصول رأس المال، السيولة، أسواق المال الناشئة.

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[1] Bruce Hearn is currently completing his PhD at Kings College London while working as a research fellow at Cass Business School, City University, London.

[2] Jenifer Piesse is a Professor of International Business at Kings College London and a visiting Professor at University of Stellenbosch, South Africa

[3] Roger Strange is a Professor of International Business at Kings College London

1. Introduction

Equity markets are increasingly seen as important sources of investment funds in many emerging economies, both in Africa and elsewhere. Furthermore, many countries perceive the development of such markets as a means to facilitate both foreign equity portfolio investment and foreign direct investment (FDI) through the acquisition of shareholdings in domestic companies, and thus supplement low levels of funds from domestic savings. But many emerging stock markets exhibit substantial risk premia, which both push up the cost of equity for listed domestic firms and deter potential foreign investors.

This paper estimates the cost of equity in four major African markets, which collectively represent the largest and most developed equity markets in Africa, and which act as hub markets in their respective regions. 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 the severe levels of 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 there is a minimum time disparity and London is a 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, in particular, introduces the three-factor model of Fama and French (1993). Section 4 outlines the model to be estimated, which is based upon the Fama and French (1993) model, but augmented with an illiquidity measure proposed by Liu (2006). Section 5 discusses the construction of the data series to be used in the estimated model, 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. The 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.

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.

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 in Nairobi. The central depository for the EAC is based in the NSE building. Trading takes place daily by a central electronic book entry system, and is limited to the floor of the exchange

[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.

between 10-00am and 12-00. The market is dominated by blockholders and smaller retail investors with free float percentages of shares available to the public being typically low. Order flow to the market is precipitated through a small network of licensed stock brokers and their regional affiliates where investors are required to establish both a trading account with stockbroker as well as a separate individual account at the central depository. The traders on the exchange floor that operate the trading workstations and input orders to the electronically held system are representatives of the individual licensed brokers. 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 for this market, although larger companies try to follow best practice as set out in the Cadbury Report, adhering to at least some of the core principles, such as disclosure of directors' holdings. In a market dominated by the informal sector, and where so few companies in the formal sector can afford the stringent listings fees and ongoing regulatory costs, strictly following good governance is prohibitive and a considerable deterrent to listing.

Egypt

The Egyptian stock exchange is based on two distinct sites, with the principal functions of the bourse located in Cairo and a smaller exchange branch in Alexandria. The exchange is one of the oldest in Africa and while the Cairo floor was established in 1903 the Alexandria floor had been functioning since 1899 when it was used primarily for trading commodities and cotton. Currently both sites are integrated and share an integrated electronic trading platform and settlement facilities. The securities market itself is split into three component markets, namely: Over the Counter, Primary Dealer Bonds and Listed Securities Markets. Trading occurs in

equities, or the Listed Securities Market, from 10-30am to 14-30pm daily and the electronic order matching system is supported by an extensive market reporting system relaying stock news and trading information to market participants. The trading system is centrally based on the two floors 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 facility such as a pre-opening call auction in the present system 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 and will be able to handle even larger trading volumes. Settlement in this market is fully G30 compliant and takes place through central depository facilities as well as a sophisticated network of well capitalized domestic and international custodian banks (CASE, 2008).

Morocco

The Moroccan stock market is centred on the Bourse de Casablanca and 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 although the system itself and trading terminals were centrally located in the exchange. The trading system was further overhauled in early 2001 to facilitate delocalised trading from the many offices of the local brokerage community. MAROCLEAR, the national central securities depository, was established in 1998 to facilitate settlement, securities transfer and payment, to minimise operational risks and became fully G30 compliant in late 2001 with settlement versus delivery occurring on trade date plus three working days, or T + 3 (Bourse de Casablanca website, 2008). Trading is reported through sophisticated local electronic reporting to market participants and also international data vendors such as Bloomberg and Reuters. This

gives the market the opportunity to attract overseas investors. Stock market awareness is generally high in Morocco and the exchange is used as a successful route for domestic flotation while attracting a significant retail and institutional base of 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 suitable for modelling a risk-adjusted capital asset pricing model. Furthermore, given the need for finance in order to promote economic growth and development it is essential for equity markets to be competitive and attract capital. Companies and projects seeking to raise funds on markets that have higher costs of equity are at a distinct disadvantage from 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 proposed 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, which hypothesized that asset returns would be related *inter alia* 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) for the United States 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) and the costs of trading (Amihud and Mendelson, 1986) or by 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 rather than smaller ones 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 or large privately owned companies or multinationals. All appear to represent profitable investments because of investor confidence 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 a number of variables have been constructed in the recent literature to capture or proxy liquidity, each has its own shortcomings depending on what 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 resembles similar measures developed from a market trading volume order flow perspective and defines the illiquidity of stock j in month t is

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

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 sectional liquidity risk factor is simply an aggregation of this measure across all stocks expressed

$$ILLIQ_{t} \equiv \frac{1}{N_{t}} \sum_{j=1}^{N_{t}} ILLIQ_{jt} \quad (2)$$

where N_t is number of stocks available in month t.

Martinez et al (2005) states that when this factor increases it should 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 behaviour 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 previous work documenting that smaller market value portfolios have been found to 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 to apply 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 the illiquidity factor (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) the excess return on the market portfolio, $R_m - R_f$; (ii) the difference between the return on a portfolio of small-size stocks and the return on a portfolio of large-size stocks, SMB;

and (iii) the difference between the return on a portfolio of high illiquidity stocks and the return on a portfolio of low illiquidity stocks, ILLIQ. Therefore, the expected excess returns on a portfolio *p* of emerging market stocks can be written as

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

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:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + S_pSMB_t + H_pILLIQ_t + \varepsilon_{pt} \quad (4)$$

where the variables are described above and $\varepsilon_{p,t}$ is an iid disturbance term. The factor sensitivities or loadings, β_p , S_p , H_p are the slope coefficients in the time series regression.

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 further sorted into three separate illiquidity-ranked portfolios according to their illiquidity factor values in ascending order. Nine size-illiquidity portfolios were thus constructed. The second sub-section presents and discusses 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.

Data Sources and Series Construction

The values of the daily total returns are from Datastream for each stock held within the constituent list of the overall market indices for South Africa, Kenya, Egypt and Morocco and for the FTSE100 index in London. These were supplemented with daily stock price levels 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. 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 stocks market capitalisation in December of each year, calculated from the product of the number of shares outstanding with 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 in order to assess the sterling traded impact on price, it is necessary to use the absolute value of the returns. 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 process. It is necessary to use caution in the interpretation of 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 involved in generating 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 this choice of markets is preferred to many others in Africa. For example, many markets are large but highly illiquid, such as Nigeria where there are 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 UK and South African stocks. Equally, other methods commonly used in the literature to determine the market variable, such as a regional investment index proxy, such as 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.

Descriptive Statistics

Descriptive statistics for all nine size-illiquidity factor sorted portfolios and the zero-cost SMB and ILLIQ portfolios are presented in Table 1. In general, the average mean returns increase considerably from large to small size stock portfolios. This is also reflected in the measure of volatility or risk, 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, measured by higher standard deviations, but also have higher potential returns, that is, higher means. Although there is little discernable difference between the cross section of low to high liquidity portfolio means, there is an increase in volatility and standard deviations from low illiquidity to high illiquidity stock portfolios. Even

in a less liquid market this result is expected since the impacts of sudden erratic order flow on stock prices reflect 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 reported by Shum and Tang (2005). This result is further highlighted by the exceptionally high coefficient of variation associated with the market portfolio of the Kenyan Alternative Investment Market (AIMS), in contrast to the value for the main market. The AIMS market was established for smaller SME companies that are unable to meet the more stringent criteria of the main listings board and tend to be smaller with shorter histories with less investment information and analyst coverage.

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

Size	Illiquidity									Zero-cost Portfolios		
	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 proced ure 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.

The UK has the lowest coefficient of variation and the lowest average mean return, with the sole exception of the Kenyan AIMS market, as well as the lowest standard deviation compared to the rest of the sample that are all emerging and frontier markets and thus subject to higher risks.

Table 2 reports the results of the annual average number of stocks in the monthly portfolios for the nine size-illiquidity constructed portfolios. Although it is evident that there has been a net increase in the number of companies within each size/liquidity sorted portfolios that would be indicative of some degree of potential survivorship bias, failed and de-listed company's data series 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 UK and South African based companies 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 portfolio. 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 appearing in the medium size, high illiquidity portfolio they start to appear in earnest in the small size portfolios across all ranges of liquidity within this size bracket as well as a number of South African and a very small number of Egyptian and Moroccan companies.

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 only very limited trading profiles.

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

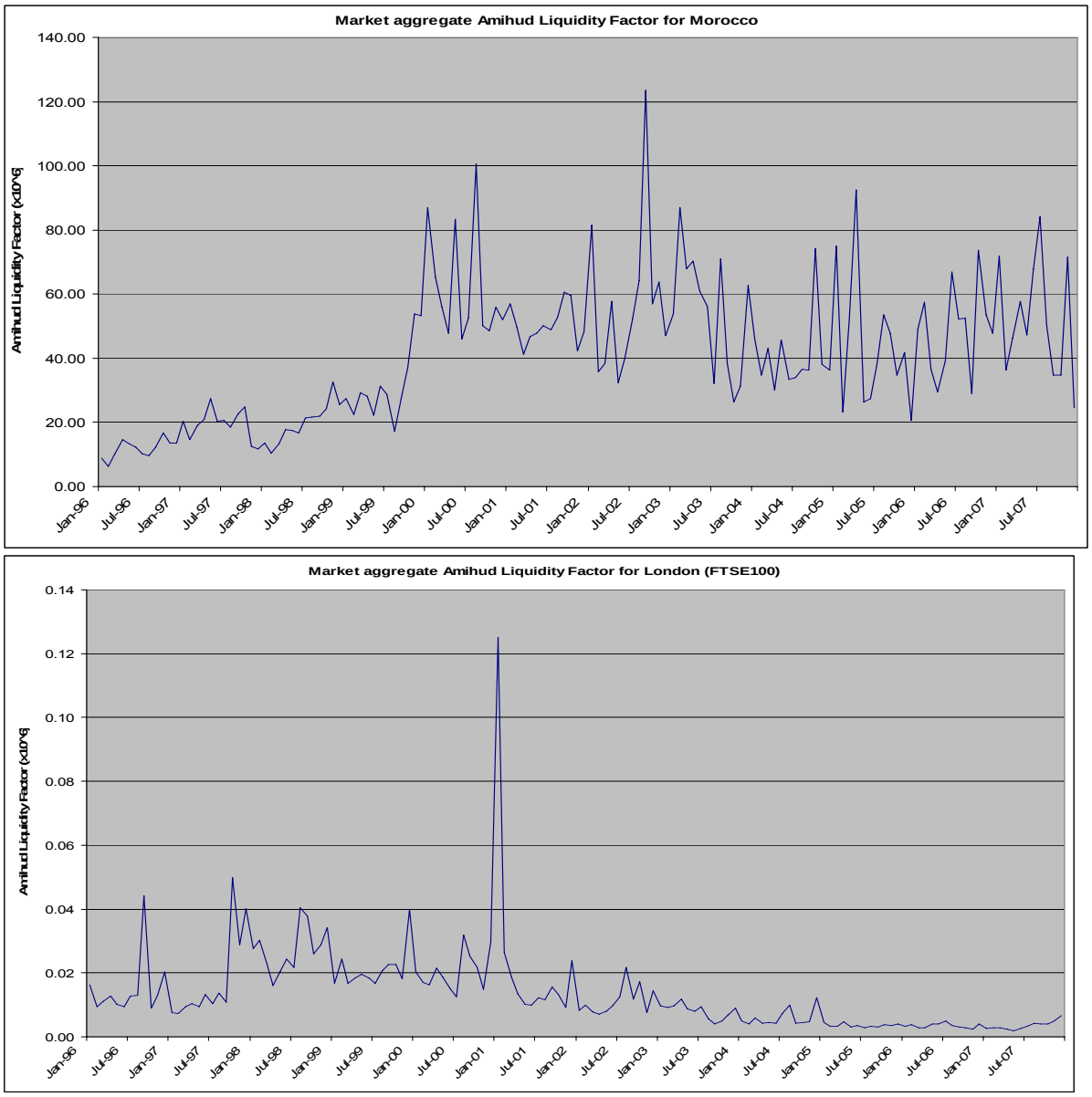
Illiquidity Factors

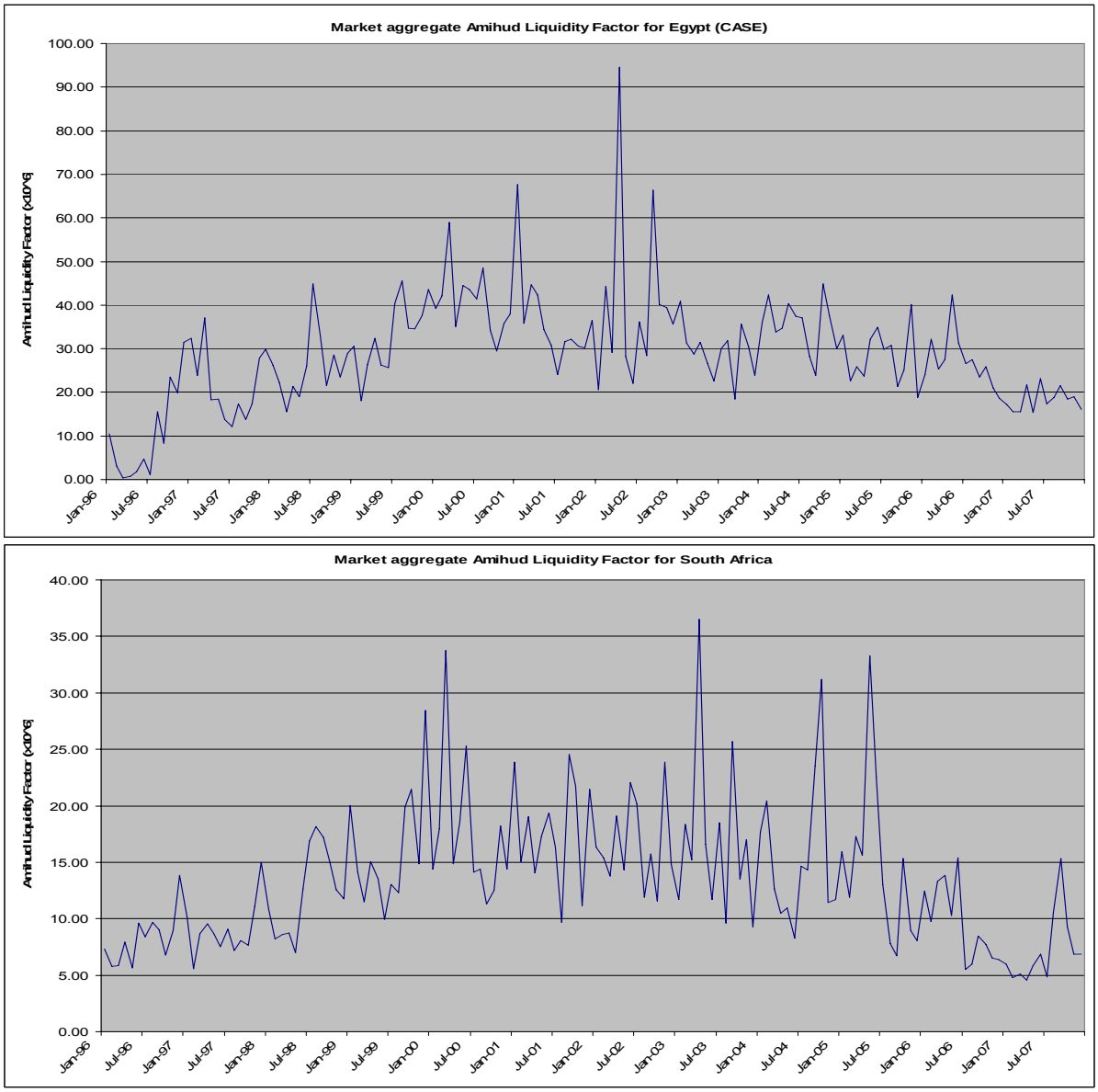
Figure 1 shows the cross-sectional market aggregate average illiquidity factors. Again, caution is necessary in interpreting these data as market-wide indicators of liquidity because of the sample bias that results from the simple equally-weighted average of individual stocks illiquidity. However, they 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 in order to facilitate comparison.

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 are in both markets' illiquidity profiles. Following the establishment of electronic trading, the central securities depository, and more effective regulation during the late 1990s and early 2000s the effect appears to be negative, given the substantial increase in aggregate market illiquidity for Morocco. Egypt follows a slightly different profile and while levels of aggregate illiquidity are comparable to those of Morocco, illiquidity decreases after 2005. The markets of London and Kenya are markedly different from all the others. Illiquidity for London differs from other countries in the sample 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 market, the main and AIMS. It can be seen that 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 stock exchange in Kenya during this period. However, due to the size and variety of companies in the main market compared to the AIMS the aggregate levels of illiquidity are both higher and more variable compared to the other two markets.

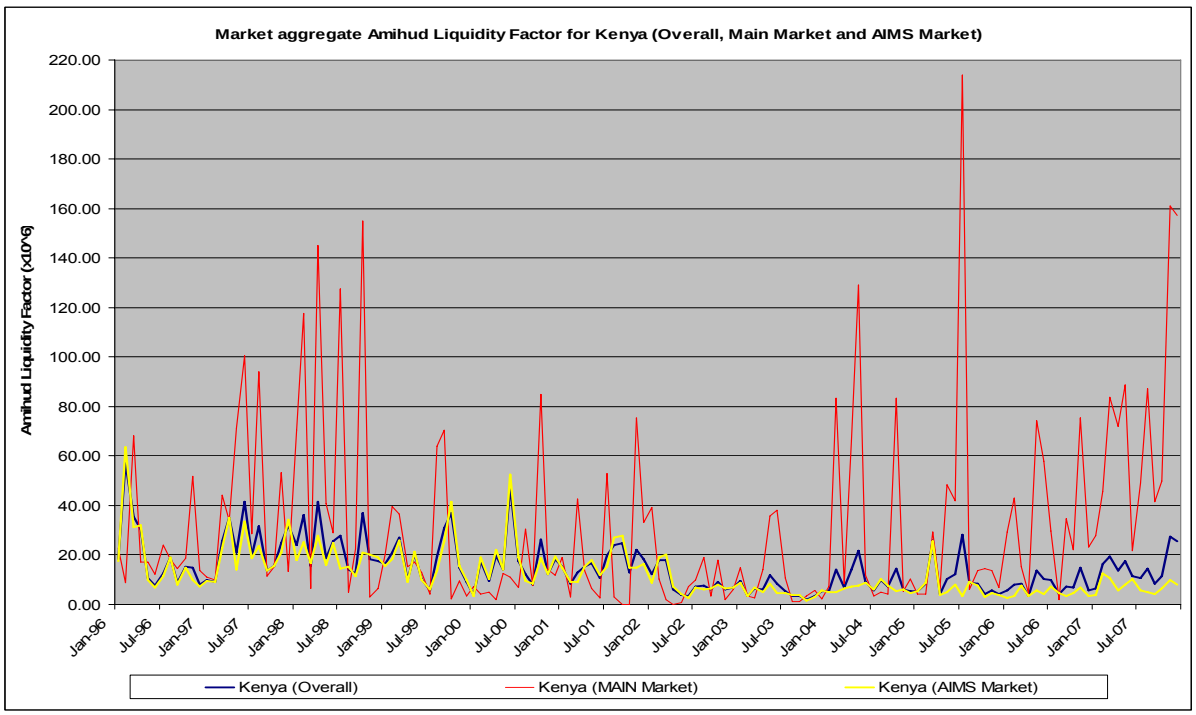
Figure 1: Aggregated Market Illiquidity Factors, by Country





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

Estimation Methodology

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. 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. 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 thus 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 the opposite of the case for the large-size firms. This behaviour is not as would be expected and is demonstrative that different valuation techniques should be used on small firms as they do not provide useful hedging behaviour for investors using these valuation techniques.

The estimated coefficients on the illiquidity factor-mimicking portfolios tend to be larger than those of the size mimicking portfolios and the levels of significance is also varied and reflects that reported for the size coefficients. 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 marginally significance. Generally the coefficients for 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 for 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 behaviour. Consequently, and in line with similar conclusions for the small-size portfolios, a different valuation methodology would be needed to accurately price very high illiquidity stocks and firms. The absolute size of the coefficients of 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 size of company stocks. The increased explanatory power of these models illustrates that the augmented CAPM is appropriate for highly illiquid markets. This is very important, as the vast majority of research on the original linear model 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 component countries, the model has a good fit and the size and illiquidity factors are significant across the entire sample group.

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(α_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(β_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

Table 5 reports estimates of the cost of equity calculated from the expected returns from each country regression. Negative cost of equity estimates in this case provide evidence that the annual discount rate used to value projects is actually a premium indicating a substantial increase in value through time. It should be borne in mind at this stage that the market portfolio used is restricted to a sample set of largely small and illiquid African markets and consequently the only market with a small and negative cost of equity (i.e. London) stands apart from the other markets owing to the firms of the London market also being members of the world elite FTSE100 index. This is in contrast to positive estimates of cost of equity which indicate the size of the discount factor to be applied to project cash flows in valuation. As such there is considerable variation in the size and direction of the estimated discount function to be applied to project cash flows when considering the market as a whole.

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

6.1 Average Returns in the London Market

The London market is represented by the FTSE100 index. The constituent 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 corporate communication mechanisms in place to ensure that information is incorporated into market prices. Owing to the significant fixed costs involved only the largest,

best performing and most heavily capitalised companies can afford this trade off between the fixed costs incurred from adherence to a strict regime and the consequent significant decrease in 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 all three factors that is, market, size and illiquidity premiums explains over 65% of the variance. However the sole 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 within the market portfolio the London market would likely have an extremely small cost of equity value. The value would be smaller still because the companies chosen to represent the London market are taken from the constituent list of the globally top performing FTSE100 index. In particular, firms being able to meet the stringent criteria of the FTSE100 list commonly adhere to corporate governance of the Cadbury Report, the most stringent transparency requirements of the Main market and often in the case of multinationals also adhere to the US Sarbanes-Oxley regime which is the most stringent in world. In combination this sets the firms from London in this sample as being distinct from the rest of sample group firms and subject to a much lower cost of equity.

The cost of equity is calculated from the annualized combination of the total risk premium, which is the sum of market, size and illiquidity premiums, and the risk free rate that is proxied by the 1 month UK Gilt or Treasury rate. The low cost of equity indicates that companies in this market have access to much cheaper capital and this facilitates international operations and development projects. It also explains the recent migration to London of primary listings of

major multinational enterprises such as Anglo American and Old Mutual from South Africa given the cost of equity in their home market is 30.75%.

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

Explanatory Variables	α_p	T(α_p)	β	T(β)	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

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 term 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), that is, half the total sample. As reported in Table 5, the cost of equity is 30.75%, which is the highest in the sample and is largely due to the market being highly skewed with the presence of a majority of smaller, illiquid and more volatile firms that affect the aggregate beta estimates. In this light and unlike in the London market there is a lack of a significant Jensen alpha, α_p, which implies there is less segmentation between South Africa and the other African markets. Thus, this market provides a location for raising project finance for the other African markets.

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 reported in Table 5, the cost of equity for this market is 24.13%, the highest in North Africa and second to Kenya in this sample. This would place Egyptian companies with motivation for international projects and expansion at a distinct disadvantage and likely render the exchange uncompetitive in terms of sourcing new equity capital compared to other nearby exchanges in both the Middle East region as well as Europe.

6.4 Average Returns in the Moroccan Market

Only the market premium is significant in this market. It is interesting to note that 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 reported (Table 5). While Morocco has the most advanced level of market institutional development and corporate governance in North Africa it is also worth noting that North African markets (Algeria, Tunisia and Morocco) all have French civil origin commercial legal codes and regulatory systems 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 neighbouring Francophone Tunisian Stock Exchange with the overwhelming majority obtained through bank loans (Bourse de Tunis, 2008). Thus, market estimation of the cost of equity and cost of capital may omit a number of more relevant variables associated with the structure of the financial system.

6.5 Average Returns in the Kenyan Market

There are considerable differences between the three component markets that make up this market, as reported in Table 7. The relevant variables in 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 the Alternative Investment Market, or AIMS, all three variables are significant. The adjusted R^2 for the main market is 0.1820, while for the AIMS market it is 0.2103. Despite only a negligible difference between the main and

AIMS models in terms of adjusted R^2, the significance of the illiquidity premium in the main market differentiates this with 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 those of major markets such as Egypt and South Africa, and where the AIMS market has had to relax even these standards in order 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.

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(α_p)	β	T(β)	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

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 that of 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, which is designed to encourage listings from the SME sector. Illiquidity series were constructed on a time-series cross-section basis and incorporated into the Fama French (1993) risk-adjusted CAPM.

The results show that this model is superior to the Sharpe/Linter 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, the premiums attributed to the size factor and the illiquidity factor, are important parameters 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 volatility in their returns. This has is largely responsible for the well regulated South African market having the highest cost of equity for the entire continent owing to that market being overwhelmingly dominated by small and illiquid firms. Secondly returns decrease when the size premium increases, and in very high illiquidity firms, where returns increase when the illiquidity premium increases. However, the most striking differences between all the sample countries are in the dramatic variation in costs of

equity. Not surprisingly, London has the lowest cost of equity, which has already encouraged prominent South African firms such as Old Mutual and Anglo American to migrate their primary listings from Johannesburg to London. Morocco has the next highest cost of equity, being only slightly above that of London and in line with its level of development. There is a considerable jump in cost of equity to that of Egypt which is on a level with Kenya. The Kenyan market itself exhibits a substantial differential of over ten percent in cost of equity between the main listings board and that of 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 attempting to attract the SME sector is seriously flawed. The uncompetitive nature of AIMS markets as a source of finance for SMEs is particularly evident in the light of a dominant banking sector within many African economies that relies on the intangible nature of longer term relationship-based monitoring and surveillance of company performance to achieve lower costs of capital. This further exacerbates the uncompetitive nature of AIMS markets in developing countries where the less restrictive listings and corporate governance requirements hinders investors access to information and it's incorporation into prices. Finally South Africa has the highest value of cost of equity which is attributable to the proliferation of smaller firms making up this market.

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' inability to access cheaper finance acts as an effective constraint in rendering overseas expansion uncompetitive

and places them at a distinct competitive disadvantage. Profit margins of firms have to be considerably higher than competitors who are able to raise finance in developed markets, given the same operating costs, 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 shift in emphasis 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, where local AIMS markets have lower premiums than those in much of Africa, while not being subject to the considerable fixed expenses of compliance to the very strict corporate governance, disclosure and regulatory regimes of these markets.

In terms of the international investor there is considerable evidence of segmentation amongst the African emerging markets highlighted by the very different risk premiums and costs of equity. This indicates that investment in these markets would be subject to extensive and variable levels of transactions costs. Investor information search and verification costs are substantial in the light of well documented poor corporate governance regimes and incomplete regulation. However considerable benefits can be made through 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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