

The Nascent Real Estate Investment Market in Ghana

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Key words: Residential investment, real estate performance, price and rental indices, Ghana

SUMMARY

Globalisation of all forms of real estate investment has increasingly demanded that performance benchmarks of an appropriate quality and international standards be made available to investors and fund managers. For the first time in Ghana, residential price and rent series are developed from hedonic models. These time series are, in turn, used to generate other performance indicators – measures of investment yields and total returns (nominal and real) – in a rapidly growing residential real estate market, using transaction-based data from Accra and Tema, the dominant market. Having generated performance indicators for the aggregate market, this paper also conducts further quantitative analysis of tests for robustness. These take the form of estimating results for different sub-samples representing the various residential submarkets in the country.

The final section provides an international context for the performance of Ghanaian residential investment market, from the viewpoint of a US resident investor. Overall, residential total returns have run at annualised rate made up of a relatively stable income return and highly volatile capital growth between 1992 and 2007. Across submarkets, the differences in long-run returns have been in large part driven by variation in rates of rental value growth.

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1. INTRODUCTION

The development of real estate performance indicators such as value indices, yields and total returns – real and nominal – promotes improvements in the analysis of the market rewards and risk and also results in a better knowledge and understanding of the market dynamics. These indicators, in turn form the basis for modelling the causal relationships between real estate market and the economy, and provide a clearer insight into the market's contributions to national development. Perhaps, of supreme importance is the opportunity that is provided by well constructed performance benchmarks for individual real estate investments as well as portfolios to be purposely and comparatively measured against other asset classes such as Treasury Bills and equities or stocks. The signals generated by real estate price indices tend to assist investors, analysts and researchers to make more informed investment decisions and/or to provide better advice. In addition, the indices tend to facilitate the creation of real estate indirect investment products. Real estate price indices are also used as a deflator of property expenditures. This factor allows the comparison of real estate values and expenditures at different points in time.

Meanwhile, real estate is a highly heterogeneous good and is transacted in markets that are inextricably intertwined with high transaction costs. Liquidity issues and government intervention in the markets further introduce intricacies in the observation of general price changes. The difficulty in observing the true price movements of real estate markets is a fundamental concern that underpins the construction of real estate price index.

Within Europe, the UK has shown the richest experience in the construction of real estate performance indices. Some of the indices have been well established since the 1970's and have been met by a wide range of competing indices constructed by actuaries and specialists such as Combined Actuarial Performance Services [CAPS], Jones Lang Wotton, Richard Ellis, Hillier Parker and Investment Property Databank (IPD). The history of the UK experience therefore provides ample information to show a course in constructing performance indicators elsewhere, particularly in Ghana. Fundamentally, and most importantly, there is the need to compare returns from the various investment vehicles and also to consider their levels of risk. In the UK, for example, the quantitative movement rooted in the 1960s and 1970s resulted in a growing demand to analyse the returns and risks associated with investments. In particular, external pressure created by deregulation of the UK Stock Exchange in 1986 further increased the demand for quantitative analysis to support asset class decision-making. For real estate to be included in this framework as well as the debate of its continuance as an asset class it became necessary for its performance to be quantifiable.

There is a huge potential Foreign Direct Investments (FDIs) into emerging economies such as Ghana, which seek to target the real estate market. The volume of international money seeking a home in this country has increased significantly in recent years, in part as a response to the growing real estate market. Evidence is available in the form of the massive stock of residential units that have emerged in neighbourhoods of Airport Residential, Cantonments, Labone, Ridge and in dominant commercial zones including the Airport city. Indeed, the key factor to support this trend is the provision of benchmarks to highlight real estate market performance, which local and foreign investors need as indicators to commit capital.

The contribution of real estate as an important segment of national economy is measured by studies using macroeconomic indicators such as GDP (see Hetherington, 1988; Gardiner and Henneberry, 1988, 1991; Crosby and Keogh, 1990; Liang and Gordon, 2003). Whilst the value of commercial real estate generally is equivalent to 45% of GDP in mature developed countries, Hughes and Arissen (2005) estimate the contribution of higher quality real estate at less than 45% of GDP for developing countries. Sub-Saharan African countries are classified as developing, and demonstrate a low level of economic development. The sub-region however, is characterised by a number of countries such as Ghana with a growing real estate investment market, which offers new investment opportunities. Extending the Hughes and Arissen (2005) formula to a full set of African countries puts the range in investible real estate value as a fraction of GDP from 8% in the poorest countries (Burundi and Ethiopia) rising to between 20% and 28% in the most prosperous (Algeria, Libya, South Africa and Botswana). The rate for Ghana is estimated at 15%. Real estate investments in the country have so far consisted mainly of residential developments, across a range of price levels. An emerging commercial and industrial sector remains largely for owner occupation or rental only.

Research on real estate market development in Africa is for the most part limited to issues of land rights and titling, where the objective of governments, particularly in the past decade has been to develop a sustainable land administration system. A few previous studies (see Fiadzo, 2004; CHF International, 2004; and Hammond, 2006; Buckley and Mathema, 2007) focus on the general housing situation in Ghana. The residential investment market, surprisingly, has received little attention. Despite the considerable evidence available on formal residential real estate transactions – sales and lettings – very few previous works have quantitatively examined the performance of this market as an investment vehicle.

Given the trend towards more local and foreign investors, it is particularly important that they be fully aware of real estate performance benchmarks that are available in Ghana. This paper applies hedonic modelling techniques to 3,250 transaction-based data, to estimate price and rent indices for residential investments in Ghana. The price and rent series are, in turn, used to generate measures of yields and total returns in Accra and Tema, the dominant commercial and industrial conurbation in the country. It also seeks to place residential investment within

a broader context in Ghana by measuring its performance relative to competing investment media such as equities and the Treasury Bills.

The remaining sections of the paper are organised as follows. Section 2 reviews related literature to highlight the gap which the paper seeks to fill. Section 3 describes data and methodology employed. This is followed by section 4, which discusses the results and also reports on key findings of the market's performance; whilst section 5 concludes.

2. REVIEW OF RELATED LITERATURE

Very few studies on the performance of formal residential investment market in Ghana have been undertaken. Rather a large number of studies on "land rights" issues (see Bentsi-Enchill, 1975; Agbosu, 1990; Kasanga and Kotey, 2001; Antwi and Adams 2003; and Mahama, 2006) have covered the real estate market. Recent studies however, have extended the focus; Fiadzo (2004) in analysing the quality of housing finds tenure, age, income, gender, marital and employment status as key determinants. Hammond (2006) examines the development of real estate market and investment and finds policies of government to have created perverse incentives.

The small number of studies specific to the estimation of real estate values and returns are of the most direct relevance to the objectives of this paper. The earliest work of this type is Asabre (1981). It applies hedonic analysis to explain the sale price of vacant lands in Accra. Original data on 211 transactions of vacant urban sites from 1974 to 1978 were obtained from the Bank of Housing and Construction (now liquidated) and three unnamed major real estate brokers in Accra, and subsequently cross-checked with the Lands Department (now Lands Commission). The results suggest that variables such as location, zoning, land tenure, ethnic clustering, time-of-sale, lot size, and site services contribute to the determination of land values in the formal sector. The results also suggested that stool lands – in customary ownership – were sold at discount prices. The study however, does not extend to any estimates of changes in land values over time.

Antwi (2002) investigates the relationship between price of building plots and explanatory variables including date of transaction, state of development of the land, neighbourhood quality, whether the land was obtained from government or customary land owners, source of finance, the extent of market search undertaken before purchase, sources of market information, perception of real estate rights purchased, and the cost of registration in the informal sector. The study also applies hedonic methods to transaction-based primary data from a sampled survey of 305 market participants such as land purchasers, customary landowners and real estate consulting firms, but limited to the performance of the informal real estate market in Accra. It finds real estate titling and tenure are not significant factors in price determination, suggesting that all purchasers perceive they are effectively buying perpetual real estate rights. Market information is also found to be informally acquired by all land purchasers and therefore not an important variable in price determination. But as in Asabre (1981), no time series estimates of prices are produced.

Antwi and Omirin (2006) rather generate measures of change in residential values, done by comparatively examining the informal real estate markets in Ghana and Nigeria. Using primary data for only three years (1999 to 2001 inclusive) on rental values and premiums or “goodwill” from surveys of tenants in Accra, Ghana, and from tenants, owners and land agents in Lagos, Nigeria, the study finds a real annual price growth of up to 10% per year for Ghana. And also, it estimates comparable residential yield at 6% for both formal and informal sectors in Ghana. However, in contrast to other previous studies, Anim-Odame *et al.* (2009) investigates the applicability of the hedonic approach for creating indices of residential real estate values from state land registration and valuation systems in Ghana. Using a much larger sample size – 2,950 transaction-based data – from five classified locations in Accra and Tema for 1992-2005, sale prices are modelled, first, for the aggregate sample, before segmenting the market on the basis of two sub-periods (1992-1998 and 1999-2005) and three price bands. The main conclusion is that heterogeneous real estate characteristics such as the number of bedrooms, number of storeys, real estate size and type, quality of landscaping, plot size, security of tenure and location are all significant variables that influence real estate prices in Ghana.

The attention of researchers and investors in income producing real estate is thus heavily skewed towards land ownership rights and titling, leaving the economy with small but rapidly growing formal markets uninformed by the standard market indicators such as price and rent indices, yields and total returns, which are generated in this current research. This paper therefore makes a major contribution in knowledge and understanding. It fills a clear gap in existing research by primarily using archive data to analyse the past performance of the residential real estate markets in the country.

3 DATA AND METHODOLOGY

This study uses sale and rental data from the records of the Land Valuation Division of the Lands Commission and the HFC Bank for the period 1992 to 2007, with a total number of 3,250 observations. The real estate specific variables used in the analysis include number of bedrooms, presence of garage and outhouse, gross internal floor areas, plot size, number of storey, unexpired term, whether state or customary¹ land grantors, date of transaction, type of unit (detached or semi-detached) and quality of landscaping. These are captured as explanatory variables. Time and location dummy variables are also included. The time dummies are based on the year of sale and/or letting.

All property records are classified into five submarkets identified primarily by a residential zoning typology devised by the Ghana Ministry of Local Government (see Ministry of Local Government, 1990), allotting to each zone titles which reflect the overall status of each zone. The Ministry of Local Government typology is based upon a large set of neighbourhood

¹ Customary refers to the larger indigenous land owning groups, communities or families comprising people of common ancestry and headed by an individual - king, chief or family head.

characteristics including the type of stock (plot sizes, detached or semi-detached units), quality of infrastructure (roads, drainage and utilities), and availability of amenities. In the absence of more elaborate and finely grained classifications of neighbourhood characteristics, the Ministry of Local Government – through the Town and Country Planning Department – classification constitutes the best available system for differentiating the defining characteristics of residential locations. The five locations are therefore treated as additional discrete explanatory variables in the models used in this paper.

The analysis for Accra is conducted for four submarkets differentiated primarily by the quality of stock and neighbourhood: Upmarket, Gated Market, Emerging Upmarket and Middle Income Market. These names are adopted for the current research in place of the official income-based residential classification such as “high-, middle-, and low-income” residential sub-markets. In Tema, residential locations, referred to as communities, are more homogenous in type, and are classified into a single “Tema” category.

Price and rent models have been developed using hedonic techniques to construct the residential indices. The price and rent models are represented by the equations:

$$\ln P(x_j) = \beta_0 + \sum_{i=1}^n \beta_i \ln(x_{ij}) + \sum_{k=1}^n \beta_k D_{kj} + \varepsilon_j \quad [1]$$

$$\ln R(x_j) = \beta_0 + \sum_{i=1}^n \beta_i \ln(x_{ij}) + \sum_{k=1}^n \beta_k D_{kj} + \varepsilon_j \quad [2]$$

where $\ln P(x_i)$ and $\ln R(x_i)$ are the natural logarithm of price and rent respectively, β_i and β_k are coefficients, $\ln X_{ij}$ are the natural logarithms of continuous independent variables, D_{kj} are time dummies or other discrete variables, and ε_j represents random errors. The parameters β_i and β_k are computed using ordinary least squares.

The hedonically adjusted prices and rents resulting from the estimations above are combined, with appropriate adjustments for costs, depreciation and the structures of leases to represent the yields, income return, capital appreciation and total returns which would be achieved by investors holding a portfolio of rented residential units with evenly distributed start and end dates of the underlying leases.

4 ANALYSIS OF EMPIRICAL RESULTS

Table 1 presents a summary results from the transactions price and rent modelling of the combined Accra-Tema sample.

Table 1: Estimated price and rent hedonic results from aggregate model

Property Features	Price		Rent	
	Coefficient	T-Stats	Coefficient	T-Stats
Location Dummies				
Upmarket	0.6783	158976***	0.8185	15.7309***
Gated	0.1957	5.6710***	0.2909	7.1860***
Emerging Upmarket	Excluded		Excluded	
Middle Income	-0.2645	-8.7070***	-0.4458	-13.2035***
Tema	-0.2453	-7.3209***	-0.5081	-13.1584***
Property Description				
No. of Bedrooms	0.1548	4.4118***	-0.0196	-0.3331
No. of Storeys	0.922	9.0899***	0.0895	2.8971***
Garage & Outhouse	0.0994	4.9121***	0.1768	5.8334***
Detached	0.4738	28.9174***	0.4471	14.7937***
Semi-detached	Excluded		Excluded	
Landscaping Quality	0.1099	7.3934***	0.1051	3.8528***
Gross Internal floor area	0.2386	12.5497***	0.6477	18.0671***
Plot Size	0.2853	18.2175***	0.1557	6.6432***
Security of Tenure				
State freehold	-0.0487	-2.1762**	-0.0425	-1.2163
Unexpired term	-0.0198	-0.5500	0.1411	2.5755**
R-Squared	0.8837		0.935	
Adjusted R-Squared	0.8827		0.933	

Notes: * indicates significance at a 10% level, ** at a 5% level and *** at a 1% level

At the aggregate level, and with only minor exceptions in the disaggregated models for sub-markets, the models results show that a set of five primary real estate characteristics – location, detached or semi-detached units, quality of landscaping, plot size and gross internal floor areas – are the predominant price and rent determinants, showing the expected signs and a high level of statistical significance on the regression coefficients.

When disaggregated by sub-markets, the hedonic models confirm the impression from averages of markets which are strongly differentiated in price and rent by location and stock quality. Overall, the location variables are highly significant across submarkets and point to price and rent differentiation between submarkets within Accra, as well as a differentiation between Accra and Tema.

The empirical results therefore document the emerging formal residential market in Ghana, and point out some differentiation in the process of price formation in different submarkets. Nonetheless, as would be expected, the separately estimated hedonic models for each of the five sub-markets showed fairly similar core determinants of prices and rents across sub-

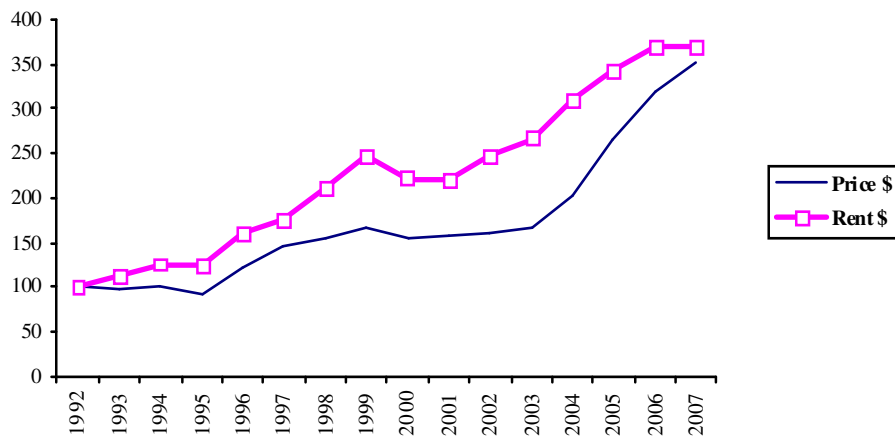
markets, but with some variation in the details. Thus, four real estate attributes – detached / semi-detached units, quality of landscaping, gross internal floor areas and plot size – predominate in the explanation of residential prices and rents in all submarkets. It appears that these four variables form a core of value determination with a high degree of consistency across sub-markets. The broadly similar coefficients on these variables for both the price estimates and the rental estimations suggest that property characteristics are priced in the same way by occupiers and investors. The only systematic exception is rather higher coefficients on GIA in the rental model than in the transactions price model, which suggests occupiers value simple property size more highly than investors.

Despite the broad consistency in the values and significance of the regression coefficients on this core set of four variables, there are some points of variation across submarkets. The importance of quality relative to unit size, for example, appears to show some systematic differences across neighbourhoods. Thus, Landscaping Quality variable carries a higher coefficient in Upmarket and the Emerging Upmarket than other submarkets, indicating a greater importance of environment where the general quality of individual houses is high, and for higher income buyers. In the Middle Income and Tema submarkets, by contrast, Plot Size and Detached status are more important determinants of price than in other submarkets, as is GIA in the Gated submarket. In the latter submarket, where other characteristics of the stock are more homogenous, the results suggest size is a more important price driver.

The other explanatory variables influence prices and rents more selectively across markets. The number of storeys, for example, has a positive and significant coefficient for both prices and rents only in the Gated, Middle Income and Tema markets. And the State Freehold variable is significant only in the Middle Income market, which may reflect the wider mix of land tenures in that area.

The only other variable with inconsistent impacts on prices and rents is the number of bedrooms which appears with a strongly significant positive coefficient in the price equations for the Gated, Middle Income and Tema markets, but is statistically insignificant in the rental equations for all markets.

Figure 1: Aggregate residential price and rent indices US\$, 1992 = 100



Meanwhile, for those explanatory variables indicating security of tenure, however, some results for the aggregate market were contrary to prior expectation. Thus, underlying land leases from freeholders which are state controlled would be expected to show a positive impact on residential values against land leases granted from customary owners where land titles are frequently subject to conflicts and extended litigation. In fact, the results tend to show negative or statistically insignificant impacts of land leases from state freeholders impacts on values. This is likely to reflect an association between state freeholds and the delivery of lower quality or subsidised “affordable” housing by state agencies such as the State Housing Company and Tema Development Corporation. It may also be the case that private developers have built only on those sites in customary ownership which have undisputed titles.

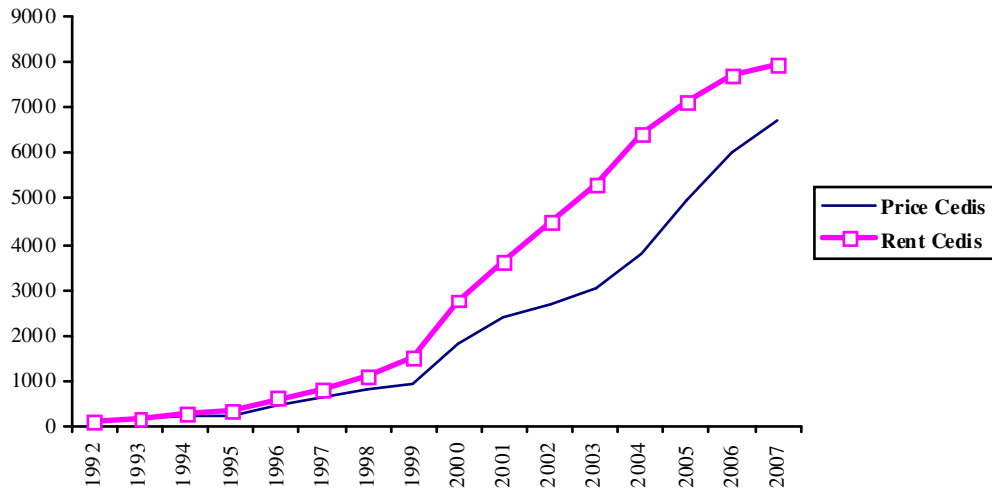
A second indicator of security of tenure – the unexpired term on underlying ground leases – might be expected to show a positive impact from longer unexpired terms. Here, however, the results suggest that length of unexpired term has no influence on values. It is likely that purchasers are likely to ignore this factor as it is generally assumed that leaseholds will be automatically renewed at low costs. This finding is consistent with a previous study on the topic (see Antwi, 2002).

The price and rent models capture strong annual movements, showing strongly significant coefficients for the majority of year dummies. The first Ghanaian Residential Indices for the values – price and rent – of residential investments are calculated and constructed from the coefficients on the year dummies. The index base figure of 100 for 1992, the excluded year dummy, is multiplied by the exponential of each respective year coefficient to create hedonically adjusted time series measures from 1992 to 2007.

The price index produced from the hedonic model in US dollars (see Figure 1), shows flat or falling prices from 1992 to 1995 followed by a substantial appreciation from the years through 1996 to 1999 then a further flat patch in the early 2000s and a final strong surge in

prices in the last four years, particularly for the price index. The strongest single year rate of dollar price appreciation – 32% – was in 1996. This may in part be explained by the remission of the restrictive law (PNDC Law 150) on letting and acquisition of property by foreign companies. Over the 15 years covered, the annualised rate of capital appreciation is 8.8% per year.

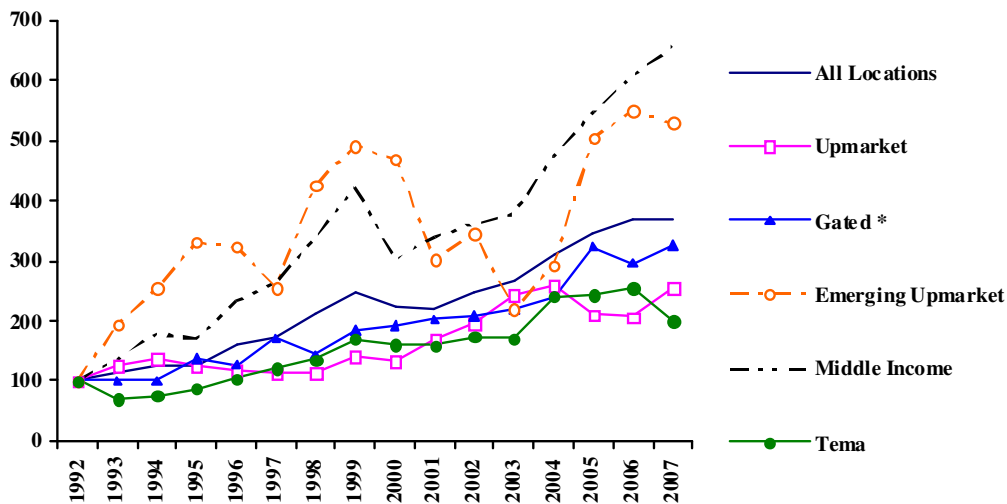
Figure 2: Aggregate residential price and rent indices Cedis, 1992 = 100



Rents rather rose gradually in the early 1990s, but declined in 1995 and then picked up rapidly from 1996 to peak in 1999. Through 2000 and 2001 rental values fell, followed by a sharp increase in 2002 through to 2006, which levelled off in 2007. Overall, an annualised rental growth of 9.1% has been achieved over the full fifteen years, fractionally higher than the dollar denominated growth in prices of 8.8% per year.

Figure 2 shows the price and rent indices expressed in local currency (Cedis). From 1992 to 2007, the Cedi:US\$ exchange rate rose from 437 to 9,358, with a depreciation in the value of the Cedi of up to 100% in individual years. The profile of residential price changes in Cedis is therefore significantly different from that in US\$. There has been a continuous growth of residential prices in Cedis throughout the period, at rates ranging from 13% to 94% per year. Over the whole period, prices have risen by a factor of 75, an annualised rate of 32.4% per year. As with capital appreciation, rents in local currency have risen every year, with the strongest rise (75%) recorded in 1996, again, following the repeal of PNDC Law 150.

Figure 3: Rental value indices by submarkets, US\$ 1992 = 100



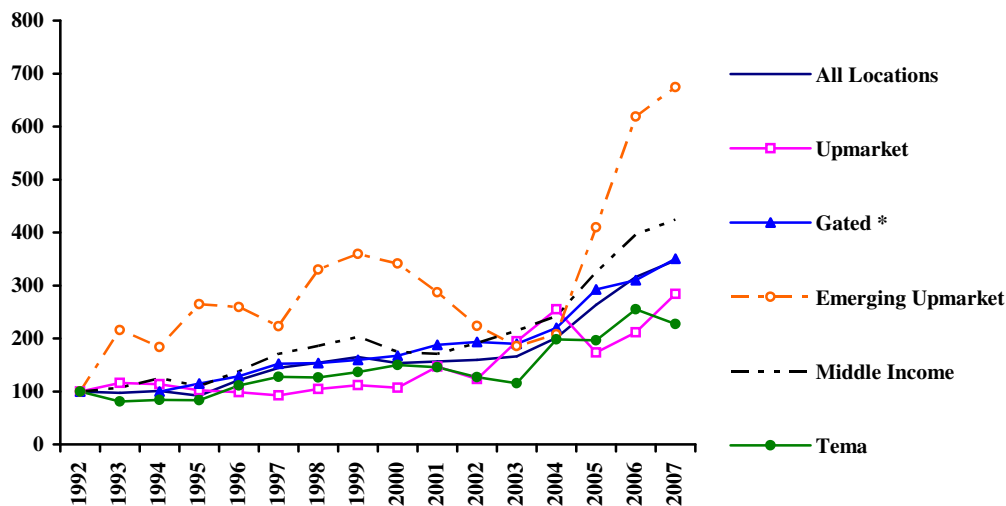
Note: Gated * 1994 = 100

Having established overall price and rent indices from data on the total sample, and through the full time period available, further analysis has taken the form of tests for robustness for both price and rent models by estimating results for different sub-samples of the population of transactions, and then the production of separate models for each submarket. The results of hedonic models for separately estimated submarkets are reported in Figures 3 and 4.

To identify differences in price and rent movements over time for different submarkets, the hedonic capital price and rental models in US\$ for each location are regressed separately rather than in a single panel (see above). The recalculation in Cedis raises no additional modelling issues, and the estimations are not reported here.

Figure 3 shows the evolution of rental values in US\$ over time in each submarket. The Emerging Upmarket and Middle Income neighbourhoods have seen much high volatility in levels of rents, and higher average growth, than the other submarkets. In the case of the Emerging Upmarket locations, some of the high volatility may be attributable to the relatively small sample size of observations (97, or 9% of the total).

Figure 4: Residential price indices by submarkets, US\$ 1992=100

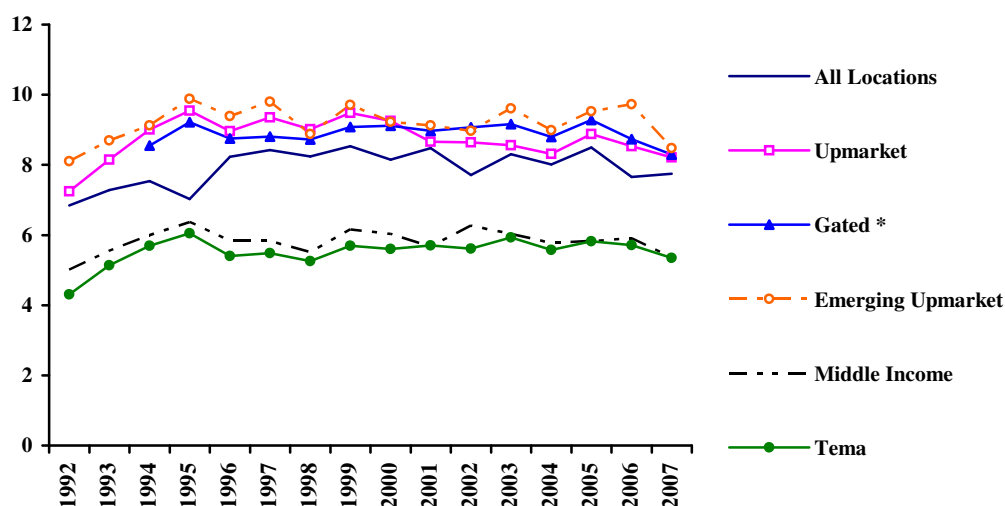


Note: Gated * 1994 = 100

This is not, however, the case for Middle Income locations, which have the largest sample of rental observations (382 or 34% of the total). In other submarkets, the progression of rental growth has been relatively stable, charting a similar pattern to the aggregate market. On the measure of annual growth rates, the highest correlation between any pair of locations is only 0.43 for Emerging Upmarket and Middle Income market, and several pairs are negatively correlated. It does not appear that rental trends in individual locations have been very strongly integrated with the overall market.

Figure 4 plots the growth in transactions prices for residential investments across submarkets, in dollar denomination. For comparison, the annualised price growth across locations is compared with the rental value growth rates discussed previously. Long term price growth runs from 3.6% per year in Tema to 13.4% per year in Emerging Upmarket neighbourhoods. This result is consistent with findings in Antwi and Omirin (2006). The broad pattern across submarkets in rates of price growth is close to that for rates of rental value growth – a product of the fairly small variation in yield movements across submarkets.

Figure 5: Residential reversionary yields by submarkets 1992-2007, %



Note: Gated * 1994-2007

Thus, the only differences in the rank ordering of submarkets by price growth from that by rental value growth is for the Emerging Upmarket and Middle Income groups, which are respectively first and second in the ranking by price growth but switch places in the ranking by rental value growth. As was found for rental growth, price growth has been stronger and more volatile in the Emerging Upmarket and Middle Income groups than in other submarkets (see Figure 4).

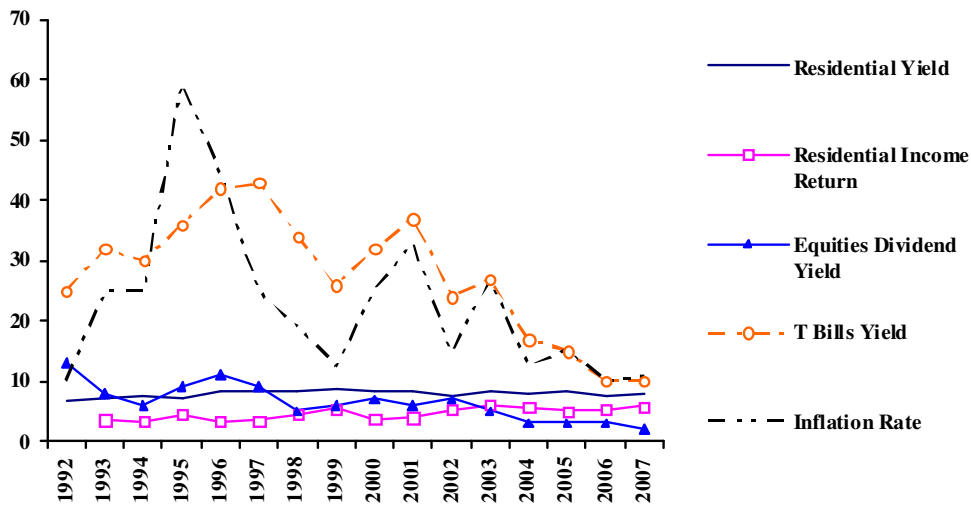
As shown in Figure 5, the profile of reversionary yields over time has thus been fairly flat. For the overall market, the yield has averaged 7.9% over the 16 years of the series, with a range from +0.6% point to -1.0% point around that average. After a step rise in the level of yield in 1996, there is neither pronounced time trend nor sustained shorter-term direction in yield movements, which seemed to show random fluctuations around a stable average of 8.2% from 1996 to 2005. Only the last two years suggest what may be a sustained fall to the end-2007 figure of 7.7%. For a given rental value, the fall in yields from end-2005 to end-2007 would be equivalent to a boost of capital values of around 10%.

Figure 6 presents yields for residential real estate, equities and Treasury Bills as well as residential income returns and rates of inflation from 1992 to 2007. Stock market dividend yields were high from 1992 to 1997, when yields ran at up to 13%. From 1998 to 2002, with a decline in the rate of inflation, yields settled at lower, more stable, rates between 6% and 7%. The last four years have seen a sharp dip in dividend yields, falling to 2% by the end of 2007. Over the period 1992 to 2007 dividend yields have averaged 6%.

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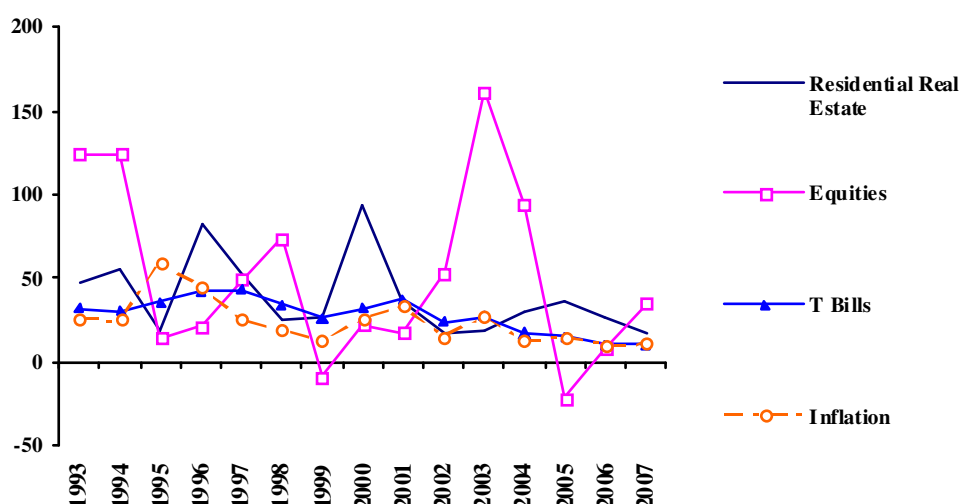
Figure 6: Residential, equity and T Bills yields 1992 – 2007, %



Sources: GSE, Bank of Ghana, Databank and own estimation

Yields on Ghanaian Treasury Bills have also reflected the downtrend in the rate of inflation, falling from a peak of 43% in 1997 to 10% in 2006 and 2007. At these levels, T Bills yields are in line with the current rates of inflation. Residential yields show a different trend over time from those on other assets, remaining relatively flat despite the change in the rate of inflation. The reversionary residential yields were close to or below equities dividend yields up to 1997, but have run well above equities yields for the last five years. The residential yield measure, as described above, is elevated by the high level of reversions produced by high rates of nominal rental value growth, especially in the 1990s. Residential income returns therefore provide a more appropriate comparison with equity dividend and T Bills yields. Rates of income return were well below equity dividend yields up to 2002, but by end-2007 had risen to 3.8 percentage points above equities, the largest margin in the history of the series.

Figure 7: Annual total returns by asset class 1993-2007, Cedis, % pa



The differentials in yield pricing suggest that residential real estate is perceived by investors as a good hedge against inflation. Thus, under high rates of inflation in the early 1990s residential real estate income return ran below T Bills yields on the assumption that rental uplifts accrued from previous rental growth – as indicated by the reversionary yield – would be realised and rental values would rise with future inflation. While this would reflect perceptions of residential values relative to inflation common in many countries, it is more surprising that the yield comparison suggests residential real estate was seen as offering better inflation protection than Ghanaian equities.

Figures 7 and 8 compare the total returns across Ghanaian asset classes set against the rate of inflation, and Table 4 summarises performance over the fifteen years to 2007. Over the full period, both returns and risks across the asset classes fall in line with the expectations of investment theory (see Table 1 and Figure 8). T Bills, with variation in returns driven solely by interest rate movements, show the lowest risk and lowest return of the three.

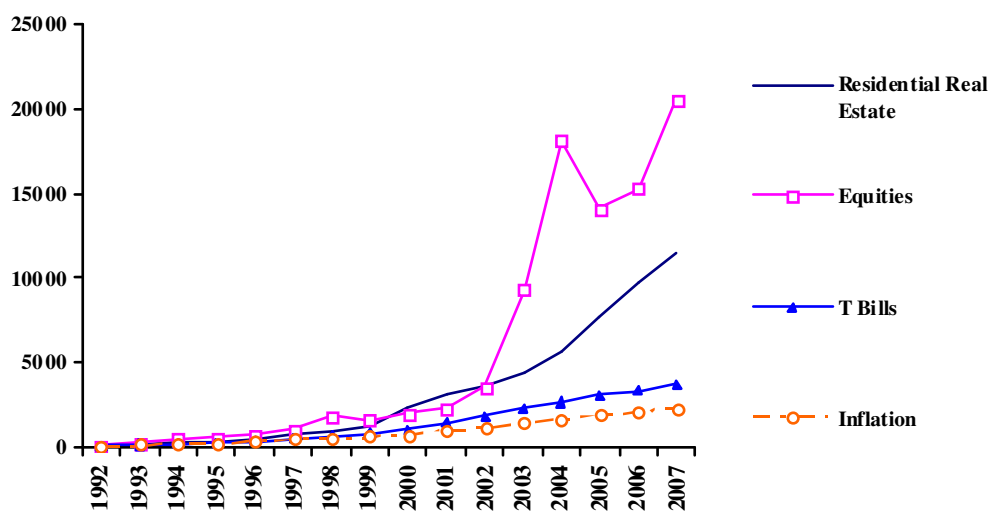
Table 1: Ghanaian investments total returns 1992 – 2007, Cedis % pa

	Residential Real Estate	Equities	T Bills
Nominal Total Return % per year			
Annualised	37.2	42.7	27.2
Mean	38.9	51.1	27.7
Standard Deviation (Risk)	22.9	52.1	10.3

Equities, characterised by highly uncertain and variable dividend distributions and capital values, show the highest return and highest risk. Residential real estate, again, with a blend of fixed rental incomes determined by leases, and variable incomes on review and re-lettings determined by rental value growth, show both returns and risks between T Bills and Equities (see Table 1). Denominated in Cedis, annualised total returns on residential investment (37.2% per year) have set between those on Treasury Bills (27.2%) and equities (42.7%).

Expressed as a Sharpe ratio (for example, residential real estate return less T Bills return divided by standard deviation of residential real estate), the risk adjusted excess returns on residential real estate at 0.49 is marginally above that on equities at 0.45. Against other asset classes in Ghana, therefore, residential real estate has offered a competitive return, commensurate with its risk.

Figure 8: Total returns indices by asset class, Cedis 1992 = 100



Residential investment has also provided more consistent returns than equities. The rate of return on residential investment has not fallen below zero in any of the 15 year history, against an occurrence in two years for equities (see Figure 7). Similarly, the annual return on residential investment has run below inflation in only two out of 15 years, compared to seven years with sub-inflation returns on equities, and five years with sub-inflation returns on T Bills. Again, residential investment has produced a return below that on T Bills in five of the 15 years, compared to seven out of 15 for equities.

This final section provides an international context for the performance of Ghanaian residential investment market, from the viewpoint of a US resident investor. Comparisons of Ghana residential returns expressed in US Dollars are given against US domestic investments in equities, government bonds and real estate, and against global investments in all equities excluding US, government bonds excluding US, and emerging market equities. No series is available over the period of the analysis for emerging market bond investments.

Table 2 summarises compares the US\$ returns on Ghanaian residential real estate with US and global investments. On a mean return basis, Ghanaian residential real estate comfortably out-performs all other assets except Emerging Market Equities. On a compounded return basis, Ghanaian residential real estate has generated the highest returns, comfortably ahead of US equities. Its level of risk, however, has been relatively low, below that on all equity markets, and only one-third of that on emerging equity markets.

Table 2: Summary total returns by asset class 1992-2007, US \$

	Mean Return % pa	Standard Deviation % pa	Annualised Return % pa	Sharpe Ratio wrt US Treasury Bills
Ghanaian Residential	15.2	11.6	14.6	0.98
US Equities	11.8	16.9	10.5	0.47
US Bonds	6.5	5.8	6.4	0.47
US All Real Estate	11.3	4.8	11.2	1.55
US Apartments	12.2	3.0	12.2	2.77
Global Equities ex US	11.6	17.2	10.2	0.45
Global Emerging Market Equities	16.5	32.1	12.2	0.40
Global Bonds ex US	7.3	10.0	6.8	0.34
US 3 Month Treasury Bill	3.8	1.5	3.8	..

Sources: Thompson Datastream: US Equities S&P 500, US & Global Government Bonds Citigroup WGBI, Global / Emerging Equities MSCI. US All Real Estate & Apartments, NCREIF, US Treasury Bill Annual Equivalent Yield, Federal Reserve

Risk adjusted returns, measured by Sharpe Ratio, on Ghanaian residential investments have therefore been well above all other assets except US real estate. The risk measured by the NCREIF US real estate indices is generally considered to be understated by valuation smoothing. If the desmoothing procedure suggested by Geltner (1993) is applied, taking the lag 1 serial correlation as a desmoothing parameter, the standard deviation on US All Real Estate over the period is increased to 10.5% per annum and that on US Apartments to 4.2% per annum. The corresponding Sharpe Ratios are therefore reduced to 0.71 for US All Real Estate and 2.00 for US Apartments. Risk adjusted returns on Ghanaian residential investment have therefore been clearly superior to all other assets with the exception of US real estate.

For a US-based investor, Ghanaian residential real estate also shows very low or negative correlations with all other asset classes with the exception of US real estate (Table 3). Given the gulf between the two economies, the correlation between indicators of US and Ghanaian real estate is extraordinarily high and significant at the 5% level. An inspection of the annual returns shows that the high correlation is produced by a coincident rise and fall in returns in the two countries from 2003 through 2007. Given the short run of years available, the correlation is unlikely to remain so high in the longer term.

Table 3: Asset class correlation matrix 1993-2007

	Ghanaian Residential	US Equities	US Bonds	US All Real Estate	US Apartments	Global Equities ex US	Global Emerging Market Equities	Global Bonds ex US	US 3 Month Treasury Bill
Ghanaian Residential	1.00								
US Equities	0.15	1.00							
US Bonds	-0.50	0.00	1.00						
US All Real Estate	0.62	0.18	-0.16	1.00					
US Apartments	0.57	0.12	-0.19	0.80	1.00				
Global Equities ex US	0.14	0.63	-0.35	0.11	0.10	1.00			
Global Emerging Market Equities	0.12	0.16	-0.40	-0.10	-0.11	0.73	1.00		
Global Bonds ex US	-0.39	0.13	0.38	-0.37	-0.50	0.26	0.03	1.00	
US 3 Month Treasury Bill	-0.09	0.28	0.23	0.19	0.25	-0.21	-0.42	-0.38	1.00

Source: Thompson Datastream: US Equities S&P 500, US & Global Government Bonds Citigroup WGBI, Global / Emerging Equities MSCI, US All Real Estate & Apartments, NCREIF, US Treasury Bill Annual Equivalent Yield, Federal Reserve

Overall, the international comparison demonstrates very favourable returns to dollar denominated investors from Ghanaian residential real estate over the fifteen years measured. This may be taken as a tentative indication that residential investment in emerging markets may be highly attractive to overseas investors. In the specific case of Ghana, the restriction of the analysis to an elite residential market catering for an emerging middle to upper income class, and the dollarization of the residential market which has insulated inward investors from local inflation and exchange rate instability, are clearly likely to have made a large contribution to that favourable outcome.

5. CONCLUSION

This paper provides an examination of the residential investment markets in Accra and Tema in Ghana. Through the construction of hedonic models, the price and rent characteristics of the markets (aggregate and disaggregate), in relation to real estate market trends have been analysed. Also, versions of the first Ghanaian “Residential Real Estate Indices” have been constructed and tracked.

The results demonstrate that hedonic models constructed using transaction-based data achieve high levels of explanation of the variation in transaction prices and rents. A price index for the overall market suggests that residential prices rose substantially from the mid-1990s following the repeal of the PNDC Law 150, and again from 2003 to 2007 with flat or falling values in the first half of the 1990s and in the early 2000s. Annualised over the sixteen years of the price index, the rise in capital values measured in both US dollars and Ghanaian Cedis suggests that investors in residential real estate have achieved appreciable capital growth of 9% and 32.4% respectively.

Residential real estate investment shows a good historic performance track record with returns and risks in the “expected” space between Treasury Bills and equities. Induced by a

favourable investment climate, residential and equities have over the period shown an upward increase in total nominal returns, particularly from the period commencing 2000. And Ghanaian residential real estate has significantly generated returns, comfortably ahead of US equities.

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Exhibit 1
Gross Domestic Product and Inflation Rates: 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Real GDP Growth (%)	4.6	4.2	4.7	4.4	3.7	4.2	4.5	5.2	5.8	5.8
US Dollar-Cedi Exchange Rate	1,637.24	2,050.28	2,314.15	2,647.32	5,455.90	7,170.80	7,932.31	8,697.49	9,004.63	9,065.76
Inflation (%)	44.4	24.8	19.2	12.4	25.2	32.9	14.8	26.7	12.6	15.1

Source: IMF World Economic Outlook 2006.

Exhibit 2
Definition of Variables

Variable	Definition
Dependent Variable	
<i>Sales Price</i>	<i>Natural logarithm of sale price of unfurnished real estate.</i>
Independent Variables	
<i>Dummy variable for quality of neighbourhood in terms of accessibility and availability of utilities and amenities.</i>	
<i>Storey</i>	<i>Dummy variable for whether real estate has Single, two, three or more storey.</i>
<i>Bedrooms</i>	<i>Natural logarithm of number of bedroom(s)</i>
<i>Garage</i>	<i>Dummy variable indicating whether the real estate has a garage.</i>
<i>Outhouse</i>	<i>Dummy variable indicating whether the real estate has an outhouse.</i>
<i>Garage/outhouse</i>	<i>Dummy variable indicating whether the real estate has both garage and outhouse.</i>
<i>Detached</i>	<i>Dummy variable for detached real estate.</i>
<i>Semi-detached</i>	<i>Dummy variable for semi-detached real estate.</i>
<i>Flat</i>	<i>Dummy variable for a flat.</i>
<i>Dummy variable indicating whether the paramount interest in the subject land is held by the government or a stool (customary holder).</i>	
<i>Dummy variable for quality of landscaping relative to other real estate assets in the vicinity.</i>	
<i>Gross internal floor area</i>	<i>Natural logarithm of gross internal floor area in square metres</i>
<i>Plot size</i>	<i>Natural logarithm of plot size in square metres.</i>
<i>Tenure (Unexpired lease term)</i>	<i>Natural logarithm of unexpired lease term</i>