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Real Estate Values from Land Registration Systems in Ghana

Wilfred K. Anim-Odame
Wilfred.Anim-Odame.1@city.ac.uk
PhD Student
Tony Key
Professor Real Estate Economics
Simon Stevenson
Professor Real Estate Finance

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Agenda

- Motivation & context
- Data and methodology
- Results
  - Summary of sale price by location
  - Significance of key attributes
  - Coefficients of key attributes
  - Residential Investment Index
- Conclusions & further work

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Motivation & context

- Real estate's role neglected in economic development

- Part of a wider investigation of the operation of commercial real estate markets in emerging economies centred on a case study of Ghana

- Pilot study for a "Ghana Property Index"
  - Extraction of required data from records of Ghana Land Valuation Board
  - Preliminary testing of hedonic index construction

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Literature on Ghanaian real estate

- Asabre (1981a): hedonic analysis of sale prices of vacant land in the formal sector in Accra.
  - establishes that location, zoning, land tenure, ethnic clustering, time-of-sale, lot size, and site services contribute to the determination of land values
  - stool lands are sold at discount prices

- Antwi (2002): hedonic analysis of prices for building plots in the informal sector
  - Real estate rights are not a significant factor in price determination; suggests all purchasers perceive they are effectively buying perpetual real estate rights

- Antwi and Omirin (2006): the only previous attempt to produce time series of real estate values
  - Deals primarily with the informal sector
  - Estimates of yields, capital growth and total returns for 1999 to 2003.

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Data

- Extracted from paper archives held by Land Valuation Board
- A total of 368 sale transactions between 1998 and 2005
- Residential properties in Accra and Tema
- Verified by members of GREDA, major real estate developers
- Prices recorded in US dollars, but payable in local currency (Cedis)
- Available variables:
  - Locations
  - Number of bedrooms
  - Number of storeys
  - Garage/outhouse
  - Detached, semi-detached or Flat
  - Quality of landscaping
  - Gross Internal Floor Area
  - Plot Size
  - Security of tenure (State freehold & Unexpired term)

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Hedonic methodology

- Transactions price determined by the equation:
  - P = f (S, N, L, C, T)
  - Where P is price, S is structural Characteristics, N is neighbourhood characteristics, L is location characteristics, C is contract characteristics that affect rental income, and T is time of transaction

- Represented as a Hedonic regression

  $$\ln P(x_j) = \beta_0 + \sum_{i=1}^{n} \ln \beta_i x_{ij} + \varepsilon_i$$

  - Where P is the sale price; β_i are the coefficients, x_{ij} are the independent real estate characteristics such as no. of bedrooms, gross, floor area, plot size, etc, and ε_i are random errors.

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Sale prices by location

Table 1: Summary of sale prices by location for 1998 to 2005

Location	no. of observations	Minimum Sale price	Maximum Sale price	mean of price	Median of price
1	80	140,000	855,000	309,417	295,000
2	141	11,500	660,000	146,391	103,000
3	74	11,500	180,000	30,070	49,075
4	9	11,850	62,400	26,355	25,181
5	64	17,182	175,000	60,039	49,518
Total	368				

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Hedonic coefficients summary

Characteristics	Coefficient	T-Statistics
Location 1	0.330	3.092***
Location 2	0.106	2.750***
Location 3	0.006	0.046
Location 4	Excluded	
Location 5	-0.270	-4.128***
No. of Storeys	0.023	0.571
No. of Bedrooms	-0.030	-0.568
Garage/Outhouse	0.036	1.148
Detached	0.227	6.127***
Semi-detached	Excluded	
Flat	-0.532	-3.434***
State Freehold	0.038	0.601
Landscaping	0.180	4.296***
Gross internal floor area	0.945	20.354***
Plot size	0.171	3.634***
Unexpired Term	-0.117	-1.049
R-Squared	0.943	

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

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Coefficients on time dummies

Year	Coefficient	T-Statistics
1999	-0.033	-0.319
2000	-0.073	-0.719
2001	-0.002	-0.026
2002	-0.112	-1.181
2003	0.056	0.600
2004	0.258	2.734***
2005	0.420	4.674***

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

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The Hedonic house price index

Residential Investments Price Index (US$ Denominated)

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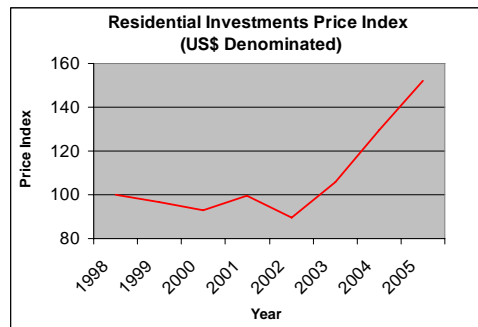
Initial conclusions

- Provisionally, we conclude that real estate heterogeneous characteristics such as property size, type, plot size, location and quality of landscaping significantly influence real estate prices in Ghana

- It is feasible, using transaction based data from a land registration and valuation system to establish reliable database on real estate values and trends over time in emerging economies.

- We therefore will extend the time period and depth of data to produce the first ever **"Ghana Index"**. Ghana will then join the very few African Countries with Real Estate Investment Index. Given the existence of similar land registration systems in other developing countries the approach may be more widely applicable.

» **THANK YOU FOR YOUR ATTENTION !**

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