Value Enhancement Effects of Building Management Practices:

A Preliminary Study in Hong Kong

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Part A

Background of the Study

Background of the Study

- "We give shape to our buildings; thereafter they shape us."
  (Winston Churchill's speech to the House of Commons in 1943)
- Inter-linkage between human beings and built environment
- **Building design** is important but **building management and maintenance** should not be ignored
  - building care culture to be fostered
- After the outbreak of SARS in 2003
  - two **public consultations** on building management and maintenance in Hong Kong

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Extent of Building Dilapidation in Hong Kong

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Extent of Building Dilapidation in Hong Kong (cont'd)

Year	Dangerous Advertising Signs	Dangerous Buildings	Dangerous Hillsides	Unauthorized Building Works	Total Number of Reports
1996	165	2,567	91	9,913	12,736
1997	350	3,658	130	12,427	16,915
1998	250	3,851	53	12,577	16,731
1999	614	4,730	130	16,999	22,473
2000	260	4,280	71	13,911	18,522
2001	178	6,671	41	12,764	19,654
2002	135	5,956	52	21,844	27,987
2003	181	8,665	48	24,870	33,764
2004	303	10,407	146	21,123	32,069
2005	331	13,999	208	25,683	40,221

Source: Buildings Department (various years)

Increased by 216% !

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Aim of the Study

- Given that:
  - proper building management being conducive to better-performing built environment
  - better-performing built environment attracting higher price
- Lack of **empirical study** on this linkage
- Aim is to investigate the relationship between **building management** practices and **property price**

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Review of Relevant Literature

- Lau (2005)
  - studying two residential developments in Hong Kong
  - hedonic price analysis
  - properties in the development with PMA accredited with the ISO9001 and ISO14001 **sold with price premium**
- Hastings, Wong & Walters (2006)
  - studying 15 residential developments in Hong Kong
  - hedonic price analysis
  - properties in buildings with PMA or statutory owners' association **sold at higher price**
- Building management treated as **dichotomous variables** in exploratory models

Part B

Analytical Model and Methodology

Analytical Model

- Founded on Rosen's (1974) seminal work: price of a property treated as aggregate of the **implicit prices** of its property **attributes,** such as:
  - property age
  - floor area
  - floor level (i.e. vertical location in a building)
  - scale of development
  - proximity to the mass transit system } location
  - district
  - management practices adopted
  - … etc.

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Hedonic Price Model

$$\begin{aligned}\ln PRICE_{st} = {} & \alpha_0 + \alpha_1 AGE_s + \alpha_2 AGE_s^2 + \alpha_3 FLOOR_s + \\ & \alpha_4 FLOOR_s^2 + \alpha_5 SIZE_s + \alpha_6 SIZE_s^2 + \alpha_7 UNIT_s \\ & + \alpha_8 UNIT_s^2 + \alpha_9 TKT_s + \alpha_{10} PE_s + \alpha_{11} MK_s \\ & + \alpha_{12} YMT_s + \alpha_{13} JD_s + \alpha_{14} TST_s + \alpha_{15} TH_s \\ & + \alpha_{16} NP_s + \alpha_{17} MTR_s + \alpha_{18} MTR_s^2 + \phi TIME_s \\ & + \beta_1 GBP_s + \beta_2 BSP_s + \beta_3 FS\_PLAN_s + \beta_4 TPL_s \\ & + \beta_5 PAR_s + \beta_6 INCIDENT_s + \beta_7 SINK\_FUND_s \\ & + \beta_8 EMER\_PLAN_s + \beta_9 RES\_SURVEY_s \\ & + \beta_{10} FIRE\_DRILL_s + \beta_{11} FIRE\_DRILL_s^2 \\ & + \varepsilon_s\end{aligned}$$

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Descriptions of the Variables

Variable	Description
$PRICE_{st}$	the **transaction price** of property *s* at time *t* (in HK$ million)
AGE_{st}	the **age of property** *s* at time *t*, which equals the difference between the date of the issue of the occupation permit and the date of the transaction (measured in years)
$FLOOR_s$	the **floor level** of property *s*
$SIZE_s$	the gross **floor area** of property *s* (measured in square feet)
$UNIT_s$	the total **number of domestic units** in the residential development comprising property *s*
TKT_s	a dummy variable which equal 1 if property *s* is located in Tai Kok Tsui, and zero if otherwise
PE_s	a dummy variable which equal 1 if property *s* is located in Prince Edward, and zero if otherwise

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Variable	Description
MK_s	a dummy variable which equal 1 if property *s* is located in Mong Kok, and zero if otherwise
YMT_s	a dummy variable which equal 1 if property *s* is located in Yau Ma Tei, and zero if otherwise
JD_s	a dummy variable which equal 1 if property *s* is located in Jordan, and zero if otherwise
TST_s	a dummy variable which equal 1 if property *s* is located in Tsim Sha Tsui, and zero if otherwise
TH_s	a dummy variable which equal 1 if property *s* is located in Tin Hau, and zero if otherwise
NP_s	a dummy variable which equal 1 if property *s* is located in North Point, and zero if otherwise
MTR_s	the distance between property *s* and the **nearest Mass Transit Railway** station (measured in metres)

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Variable	Description
GBP_s	a dummy variable which equals 1 if a set of **architectural drawings** of the subject building has been kept by the building management body for record, and zero if otherwise
BSP_s	a dummy variable which equals 1 if a set of **building service plans** of the subject building has been kept by the building management body for record
FS_PLAN_s	a dummy variable which equals 1 if a **fire safety plan** has been provided to the residents of the subject building, and zero if otherwise
TPL_s	a dummy variable which equals 1 if **third-party liability insurance** has been taken out for the common parts of the subject building, and zero if otherwise
PAR_s	a dummy variable which equals 1 if **property-all-risk insurance** has been taken out for the common parts of the subject building

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Variable	Description
$INCIDENT_s$	a dummy variable which equals 1 if **incident records** have been kept by the building management body, and zero if otherwise
$SINK\_FUND_s$	a dummy variable which equals 1 if there is remaining **sinking fund** available in the subject building, and zero if otherwise
$EMER\_PLAN_s$	a dummy variable which equals 1 if a **emergency plan** is in place for the subject building, and zero if otherwise
RES_SURVEY_s	a dummy variable which equals 1 if **regular resident surveys** on the safety and hygienic conditions of the building are conducted, and zero if otherwise
$FIRE\_DRILL_s$	the number of **fire drills** conducted every month in the subject building
$TIME_{st}$	a monthly dummy variable that equals 1 when property *s* was transacted at time *t*, and zero if otherwise;

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Part C

Data Descriptions and Analysis Results

Sources of Data

- Building data from two projects funded by the Research Grants Council and the University of Hong Kong
  - Building Health and Hygiene Index project
  - Building Safety and Conditions Index project
- **189** apartment buildings in **Yau Tsim Mong** and **Eastern Districts** assessed in 2004 and 2005, respectively
  - Attributes collected included architectural design; building service provisions; external environment; operations and maintenance; and management arrangements
- **3,057 transactions** in the 189 buildings (Jan 02 – Dec 05)
  - Transaction data extracted from Economic Property Research Centre (EPRC)

Descriptive Statistics of the Continuous Variables

Continuous Variable	Maximum	Mean	Minimum	Standard Deviation
PRICE (in HK$ million)	9.18	1.20	5.00×10^{-3}	0.79
AGE (in years)	47.00	25.21	3.00	9.65
FLOOR	40.00	10.92	1.00	6.91
SIZE (in square feet)	1,921.00	562.38	227.14	193.96
UNIT	12,896.00	518.15	3.00	1,660.44
MTR (in metres)	1,136.52	310.11	13.32	270.37
FIRE_DRILL (number of times per month)	1.00	0.17	0	0.36

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Dependent Variable: ln(*PRICE*)

Independent Variable	Coefficient	*t*-statistic		Independent Variable	Coefficient	*t*-statistic	
Constant	**-1.5659**	**-19.2481**	***	***TH***	**0.0650**	**2.5552**	**
AGE	**0.0087**	**2.3746**	**	*NP*	-0.0070	-0.2693	
AGE²	**-0.0006**	**-7.8908**	***	***MTR***	**0.0003**	**3.1970**	***
FLOOR	**0.0137**	**6.1065**	***	***MTR²***	**-2.64×10^{-7}**	**-2.6273**	***
FLOOR²	**-0.0002**	**-2.0824**	**	***GBP***	**0.1286**	**4.6112**	***
SIZE	**0.0030**	**17.4200**	***	***BSP***	**-0.0502**	**-3.3192**	***
SIZE²	**-8.89×10^{-7}**	**-7.0708**	***	*FS_PLAN*	-0.0148	-1.2503	
UNIT	**0.0001**	**8.8057**	***	*TPL*	0.0124	0.6559	
UNIT²	**-7.65×10^{-9}**	**-7.3572**	***	***PAR***	**0.0360**	**2.8534**	***
TKT	**-0.2489**	**-4.1675**	***	***INCIDENT***	**0.0752**	**4.4095**	***
PE	**-0.1461**	**-4.7288**	***	*SINK_FUND*	0.0052	0.3695	
MK	**-0.1246**	**-2.9625**	***	***EMER_PLAN***	**0.0212**	**1.6844**	*
YMT	**-0.0773**	**-2.6083**	**	*RES_SURVEY*	-0.0226	-1.4860	
JD	**-0.1197**	**-3.2671**	***	***FIRE_DRILL***	**-0.3054**	**-1.8531**	*
TST	**0.1553**	**4.6192**	***	***FIRE_DRILL²***	**0.2718**	**1.6624**	*
Adjusted *R*-squared		**0.7401**		**Durbin-Watson statistic**		2.0202	
***F*-statistics**		115.5240		**Akaike info criterion**		0.3514	
Prob(*F*-statistic)		0.0000		**Number of observations**		3,057	

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Part D

Implications of the Analysis Results and Discussions

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Implications of the Analysis Results

- Some (and not all) of the management practices attract higher property price
- Insights for **market players**:
  - knowledge about which management practices are valuable
  - property management companies formulating better business strategies
- Fostering a **building care culture** by market forces:
  - value enhancement effects publicized
  - with a view to adding premium to property value
  - homeowners more concerned and willing to practice building management in their buildings

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Implications of the Analysis Results (cont'd)

- Insights for **public administrators**:
  - certain management practices considered essential by the government but not priced by the market
- Gap between **government's aspirations** and **market's valuation**:
  - more resources directed to education and promotion about the importance of these 'undervalued' practices
  - alternatively, making these practices mandatory or subsidizing them

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Caveats and Agenda for Further Research

- Possible problem of **sample selection bias**
  - not all buildings assessed under BHHI and BSCI projects used
  - only those buildings with transactions included
  - limited generalizability of research findings
- **Dimensions or levels of management practices** ignored
  - most explanatory factors taken as dichotomous variables
  - e.g. instead of simply considering whether insurance policies have been taken out, value of insurance coverage to be looked into
- **More management practices** can be covered
  - e.g. implementation of planned maintenance and cleansing of public areas, etc.

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Concluding Remarks

- Relationship between building management practices and property price empirically studied
  - 6 out of 10 practices with **significant** and **positive** enhancement effects
- Insights for market players, property management practitioners and public administrators into:
  - which management practices are **valued most** by the market
  - gaps between **government's aspirations** and **market preference**
- A starting point for research on property management
  - **performance measurement** of property management services
  - **quality** of property management services vs. property price

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Thank You !

For comments and questions, please e-mail me at danielho@hku.hk

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