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Hong Kong Institute of Surveyors**

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**The Impact of Property Management Quality on the Real Estate
Market
-- The Correlation with Property Value**

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Executive Summary

- Hong Kong is well-known for its compact and high-density development, under which high-rise, multi-story residential buildings are constructed. Inside these buildings, each homeowner has an undivided share over its common areas. However, as these areas are by no means exclusive, their maintenance is usually being overlooked. As a result, their conditions worsen, which in turn cause the price of properties inside that building to fall. In light of this, property management becomes critical, and the quality of services provided by property management companies becomes increasingly important, not only in maintaining residential buildings in good condition but also in determining the value of properties under their management.
- The emphasis on quality gives rise to the problem as to the criteria by which quality property management services are determined. Certifications and/or awards issued by professional organizations hence provide property management companies and customers alike with not only a less costly, but also a professional and standardized, evaluation of the quality of (property) management, in both general management and environmental management.
- This study purports to use the certificates/awards as a measure of management quality to gauge its effect on property price. That helps address the question of the subject issue, i.e. the impact of property management quality on property price.
- The hedonic pricing model is used to analyze the functional relationship between property price and property management service, along with these individual housing characteristics, of residential properties across three districts (16 residential estates in total) from the third quarter of 2011 to the second quarter of 2012.
- The findings show that, 1) ISO9001 certification is not significant in explaining the transaction price of sampled properties; 2) The HKMAQA and the Hong Kong Q-Mark certificate have positive impacts on property price; 3) The Estate Management Services Contractors Award appears to have negative effect on property price; 4) All selected environmental management-related certifications and awards do not have significant in influencing price of residential properties; and 5) Property-related attributes such as size of unit, the number of blocks in the estate, floor level, and accessibility to MTR station are positively-correlated with property price, while the flat's age has a negative relationship with its price.
- Several implications, in light of 1) the lack of significance among environmental management certifications/awards on property price; 2) the insignificance of ISO certifications on price of housing; 3) the positive correlations between Q-Mark/HKMAQA and property price; and 4) the negative relationship between Housing Authority's Estate Management Service Contractors Awards and housing price, are discussed.
- Due to time and resource constraints, the sample size (312 flats across three districts) is considered small. The results, hence, may not be representative as to how various general management environmental management certifications/awards impact the price of flats in other areas, or that of different

kinds of properties, in Hong Kong. Therefore, besides a more representative and comprehensive investigation of this topic among residential properties located in various parts of Hong Kong, future studies could also look at how building-specific certifications/awards, such as BEAM and the Green Building Award, might influence property value.

1. Introduction

Hong Kong is well-known for its compact and high-density development, under which high-rise, multi-story residential buildings are constructed. Inside these buildings, each homeowner has an undivided share over its common areas. However, as these areas are by no means exclusive, their maintenance is usually being overlooked. As a result, their conditions worsen, which in turn cause the price of properties inside that building to fall. Such phenomenon, according to Heller (1998), is called “tragedy of anti-commons”.

In light of this possibility, property management thus becomes a critical component, and as a result, the quality of services provided by property management companies becomes increasingly important, not only in maintaining residential buildings in good condition but also in determining the value of properties under their management. It is found by Scarrett (1983) that property management service can help achieve various short- and long-term objectives which affect property price, with the short-term objectives being financial management, enforcement of lease provisions and the long-term objectives being the improvement of property value or rental value¹. In other words, the quality of services provided by property management companies is expected to be positively correlated with property price. Nonetheless, the property management sector of Hong Kong is highly competitive. According to the Hong Kong Trade Development Council, there were 528 property management companies in Hong Kong as at 2009. In order for property management companies to stay competitive in this industry, they should seek continuous improvement in the quality of their services so that customer needs can be retained and their expectations satisfied (Hoyle, 2001).

Yet, the emphasis on quality gives rise to the problem as to the criteria by which quality property management services are determined. Currently, there is no statutory licensing systems for the supervision of property management companies in Hong Kong. In other words, there are no government measures monitoring the quality of services proffered by these companies. Under this circumstance, end-users of property management services might rely on two other channels, which are 1) opinions of other residents regarding their satisfactions towards such services; and 2) different certifications and/or awards issued by professional organizations. The former, while valuable in its own right, has its own intrinsic subjectivity issue. In addition, what constitutes quality property management differs among residents even of the same building. Hence, it renders an objective assessment of companies’ management of one particular building, as well as comparisons between different companies’ performance in this regard, very difficult and/or cost-prohibitive for those not involved in the industry. As a result, the latter provide property management companies and customers alike with not only a less costly, but also a professional and standardized, evaluation of the quality of (property) management. In

¹ Concerning property value, even though property price has conventionally been regarded as a function of different housing attributes (Hui et al., 2007), several of those attributes can actually be related to the quality of property management. For example, air pollution is an important housing attribute to be considered by potential buyers, and a well-maintained landscape can reduce the level of pollution. When a property management company is responsible for the maintenance of that landscape, it can therefore induce a positive impact on that particular housing attribute and thus on the price of property.

other words, within the context of property management, obtaining these certifications and awards, from a layman's perspective, equates certain degree of excellence in property management which facilitates housing decision-making (both ownership and rental) and thus plays a role in influencing property price.

In Hong Kong, there are numerous general management certifications and/or awards for property management companies to pursue; and as required in the proposal, we primarily focus on the following:

- ISO 9001 by the International Organization for Standardization;
- The Hong Kong Management Association Quality Award (HKMAQA) by Hong Kong Management Authority (HKMA)
- The Hong Kong Q-Mark Certification Scheme by the Hong Kong Q-Mark Council; and
- Estate Management Services Contractors Awards by the Hong Kong Housing Authority

Nonetheless, these four certifications/awards, though pivotal in their own right, only focus on the quality of general management while seemingly overlooking that of another increasingly crucial aspect of management nowadays: environmental management. In the past, various stakeholders were usually divided between two seemingly-conflicting concepts: economic development and environment protection. In short, it is either one or the other. Nonetheless, it appears that a different approach has become popular during the last two decades, especially when the idea of sustainable development was brought up in the United Nations (Gibbs et al., 1996). Within this framework, rather than choosing either economic development or environment preservation, the real question becomes how to achieve the former without generating too much of a negative impact on the latter.

According to Berry and Rondinelli (1998), such an awareness towards environmental protection among stakeholders such as the public (as customers), governments, and shareholders, has created pressure for companies to be more environmental-friendly in their operations. For the customers, their attitudes have shown noticeable changes, in that an increasing number of them prefer environmental protection to economic growth (Mainieri et al., 1997). Meanwhile, governments have adopted increasingly strict environmental regulations, in response to which it becomes necessary for companies of different sectors to modify their existing business practices such as production and marketing plans by taking environmental considerations into account (Hawken, 1993; Stigson, 1998; Gonzalez-Benito and Gonzalez-Benito, 2005). In light of such development, the adoption of an environmental management system (EMS) makes these companies focus on negative environmental effects likely incurred during their production activities, and holds them responsible for maintaining a high level of environmental standards throughout the organization (Morrow and Rondinelli, 2002).

As the public becomes more aware of the importance of environmental preservation (and sustainable development), a study of how they value a property management company's performance in environmental management is just as crucial. Regarding the assessment of environmental management quality, there are numerous certifications and awards in

recognition of companies' performance in this regard, both locally and internationally. As agreed upon by the HKIS, in addition to the aforesaid four general management certifications/awards, we would include the following environmental management certifications/awards in our investigation, namely:

- ISO14001 by the International Organization for Standardization;
- The Environmental Labels under the Hong Kong Awards of Environmental Excellence (HKAEE); and
- The Sectoral Awards under the Hong Kong Awards of Environmental Excellence (HKAEE)

This study, through an investigation of the respective impact of those seven management certifications and awards on property price, purports to find out the effect of property management quality, both in general management and in environmental management, on the property market (for a flowchart describing the rationale of this study, see Figure 1). In the next section, a more detailed presentation of these selected certifications and awards is to be provided.

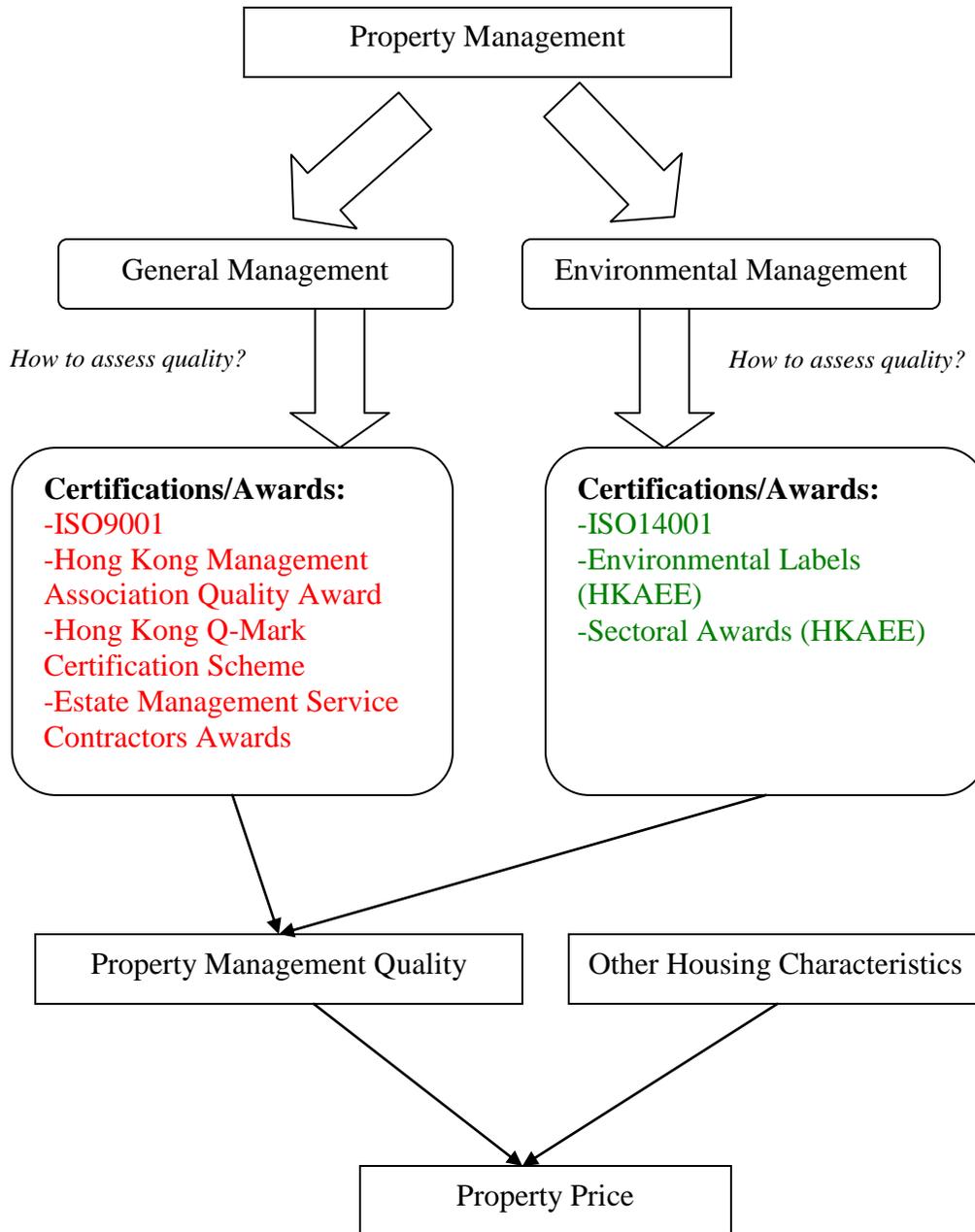


Figure 1: Flowchart describing the rationale of this study.

2. Management certifications and awards relevant to the property management industry

2.1 General Management Certifications and Awards

2.1.1 ISO9001

ISO9001 is one of the standards published by the International Organization for Standardization (ISO) under the ISO9000 series that gives the requirements for an organization's quality management system. ISO standard can assist a company to operate with an effective quality management system. Having an ISO certification is considered an advantage over their competitors. With regard to the judging criteria of ISO9001, they are divided into four major categories and eight quality management principles. For the former, they consist of 1) management responsibility, 2) resource management, 3) product realization, and 4) measurement, analysis and improvement. For the latter, they include 1) customer management, 2) leadership, 3) involvement of people, 4) process approach, 5) system approach to management, 6) continual improvement, 7) factual approach to decision making, and 8) mutually beneficial supplier relationship.

ISO9000 can improve the quality of services and thereby increase business. Buttler and Jayne (1999) examined the real estate sector and finds that ISO9000 brings several benefits that include better management, improved customer services, enhanced customer satisfaction, and its use as a merchandising instrument, as well as a tool to attract new customers. Lee (1998) investigated the service sector in HK and arrived at a similar conclusion that ISO9000 can improve sales through new customers and get fewer complaints from existing customers. ISO9000 is proved to be able to enhance the quality of services and customers will choose the company that is certified with ISO9000. Therefore, ISO9000 is used in this study as a comparison standard to investigate the inference of the quality of property management to property buyers.

2.1.2 The Hong Kong Management Association Quality Award (HKMAQA)

The HKMAQA was introduced in 1991 by HKMA. The objective of the award is to reward the commitment of the organization and brings public recognition to their outstanding standards of quality management. The award is modeled on the American Malcolm Baldrige National Quality Award (MBNQA), whose judging criteria are "widely accepted as the blueprint of excellence in quality management implementation" and it is HK-equivalent to the Japanese Deming Prize and the European Quality Award (Lai and Cheng, 2003).

HKMAQA is recognized as the most reputable award for quality management in Hong Kong. It provides a guideline in quality management for the companies to follow so that they can improve their quality. There are certain judging criteria when a company applies for this award:

- leadership;
- strategic planning;
- customer and market focus;
- measurement, analysis, and knowledge management;
- workforce focus; and
- process management (HKMA, 2010).

Such applicants are subject to a stern and comprehensive assessment procedure which lasts for six months, including assessment on submissions, screenings, presentation workshop, site visit to the company and final judging. The award winners are proved to be possessed with outstanding performance in quality management. Therefore, HKMAQA is used in this study as a comparison standard to investigate the significance of the quality of property management on the price of properties.

2.1.3 Hong Kong Q-Mark Scheme

The Hong Kong Q-Mark Scheme, established in July 1978, is administered by the Hong Kong Q-Mark Council under the auspices of the Federation of Hong Kong Industries (FHKI). According to the FHKI, the objectives of this scheme are:

- To foster industrial development by enhancing the quality of products and services, and environmental conservation, as well as management systems in compliance with internationally recognized standards; and
- To acknowledge quality excellence in products and services and environmental management, and promote the concept of quality and environmental conservation in local and oversea markets.

Under the Hong Kong Q-Mark Scheme, three separate schemes have been created, namely the Hong Kong Q-Mark Product Scheme, the Hong Kong Q-Mark Service Scheme, and the Hong Kong Green Mark Certification Scheme². Considering the nature of property management as a service-oriented industry, the Hong Kong Q-Mark Service Scheme is to be considered for this investigation.

It is expected that several benefits can be enjoyed by companies with certifications under the Hong Kong Q-Mark Service Scheme. According to the Hong Kong Q-Mark Council, a company with this certification has the confidence of customers because its products or services are audited by a third party certification body. This helps ensure quality excellence on an on-going basis, and sets product or service standards above that of its competitors. Also, the Hong Kong Q-Mark Council assists Q-Mark companies to promote their products or services through events like the Q-Mark License Presentation Ceremony, TV commercials and advertisements in local newspapers. In addition, the Q-Mark serves as a valuable tool in motivating staff, as the products (or services) carry the added distinction of a publicly recognized quality mark. And lastly, the Council's technical staff pays regular visits to Q-Mark companies to advise them on quality improvement. Currently, 66 companies have been certified under this scheme, of which 13 (19.7%) are within the property management sector.

² The Hong Kong Green Mark Certification Scheme is a system certification scheme which helps to identify, control, and monitor the environmental aspects of a company's operations. Besides, it assists companies in leveraging a green management system to monitor product and activity interactions which may have an impact on the environment. In addition, it directs companies to establish environmental performance benchmarks and make continuous improvement to achieve the desired level of environmental performance.

2.1.4 Estate Management Services Contractors Awards

As more than half of Hong Kong's public rental housing estates have been managed by property management companies via outsourcing, these companies have played pivotal roles in the provision of reliable and efficient property management, as well as in cleansing and security services to ensure safe, clean, and pleasant living environments for public housing tenants. In recognition of their work, the Housing Authority (HA) presents the Estate Management Services Contractors Awards on a yearly basis, to commend service contractors with outstanding performance and encourage them to continuously improve their services to public housing residents. According to the HA, winners of the awards are determined, based on four elements, namely 1) the scores given by an assessment panel; 2) Housing Department supervisory teams; 3) the feedback from Estate Management Advisory Committees; along with 4) the results of random surveys conducted among residents.

2.2 Environmental Management Certifications and Awards

2.2.1 ISO14001

The ISO14000 series³, published in September 1996, proffers the fundamental framework for the establishment of an EMS⁴ (Curkovic et al., 2005). Steered by the ISO technical

³ ISO14000 and ISO9000 are usually compared with each other. ISO9000, introduced in 1986, refers to a series of quality management systems standards, while ISO14000 which was introduced a decade later refers to the series of environmental management systems standards (Albuquerque et al., 2007). For the similarities, both ISO9000 and ISO14000 are management systems under which organizations are required to 1) formulate policies; 2) define roles and responsibilities; 3) appoint a management representative; and 4) train personnel (Rothery, 1995; ISO, 1996). Also, according to Kein et al. (1999), both standards require documentation, record keeping, internal audits and management reviews. A certified ISO9001 company has a well-documented and consistent QMS, and similarly a certified ISO14001 company has a well-documented and consistent EMS. However, in both cases, this does not provide information as to the company's product quality (ISO9000) or environmental impact (ISO14000), in accordance with Albuquerque et al. (2007). Given their similarities in their structures and registration processes, this provides the conditions for companies which have previously obtained ISO9001 certification to adopt ISO14001 certification, or for non ISO9001-certified companies to get both at the same time (Boiral and Sala, 1998). In fact, a study conducted by Corbett and Kirsch (2001) finds that patterns of certification to ISO14001 are highly correlated with those to ISO9001 on an international level.

Nonetheless, there are also some remarkable disparities between ISO9000 and ISO14000. First and foremost, ISO9000 emphasizes quality management and consistency, which by nature is more relevant to customers of a particular product or service. ISO14000, in comparison, is more demanding because: 1) it emphasizes continuous improvement; and 2) besides customers, it is also aimed at other stakeholders, such as governments, communities, NGOs, environmental activist groups, insurance companies, etc (Albuquerque, et al., 2007; Kein et al., 1999; Poksinskia et al., 2003; Karapetrovic and Willborn, 1998). Perhaps it is based upon such rationale that the motives behind their respective certifications differ. According to Poksinskia et al (2003), internal performance motives are more crucial for the introduction of QMS (ISO9000) whereas regulatory motives are more important for the implementation of EMS (ISO14000).

Another difference between the two is that, a certified ISO9001 company is required to use fellow ISO9001-certified suppliers while it is not necessary for a certified ISO14001 company to use fellow ISO14001-certified suppliers (Ofori et al., 2002). For instance, ISO9001 certification is a prerequisite for bidding for housing projects funded by the Hong Kong Housing Authority. Yet, ISO14001 certification (or to have an EMS) is not a necessary condition for firms to tender to public projects (Tse, 2001).

⁴ As defined by the International Organization for Standardization, an EMS is that part of the overall management system which includes organizational structure, planning activities, responsibilities, practices,

committee 207 but developed by experts from “the business sectors most interested in implementing the eventual standards” (Ball, 2003), this series aims to provide guidance for the development of a comprehensive approach to environmental management and for the standardization of key environmental tools of analysis such as labeling and life cycle assessment. It should be noted that, however, that the standards are meant to complement, rather than to replace or duplicate, a country’s regulatory system (Quazi et al., 2001).

Of the whole ISO14000 series, ISO14001 usually gets the most attention because it is the specification and guidance for use of environmental management systems (EMS), and is the only standard in the series which is certified (Ball, 2003). The ISO14001⁵, based on a simply ‘plan-do-check’ framework, consists of five main elements: 1) the environmental policy; 2) the environmental plan; 3) implementation and operation of programs to meet objectives and targets; 4) checking and corrective action; 5) and management review (Babakri et al., 2003; Rondinelli and Vastag, 2000). In order for a company to be ISO14001 certified, it can either self-declare or undergo an audit by a third-party. For the latter, the auditor is given the discretion to recommend the registering body to certify a certain company (Curkovic et al., 2005). Under the framework of ISO14001, companies could ensure a stricter application of environmental legislations, and the required documentation (for the certification) makes it easier for managers liable to legal proceedings to prove their “due diligence” should an environmental infraction take place (Boiral and Sala, 1998).

According to Rondinelli and Vastag (2000), ISO14001, in theory, could serve as a comprehensive framework for the improvement in a firm’s performance with minimal environmental management capacity or at least provide a set of guidelines for a firm with regulatory compliant practices to perform better. From a more pragmatic perspective, in accordance with the advocates of ISO14001, the standard, which is internationally-recognized, helps corporations simplify and integrate their environmental protection programs into a more coherent framework (Cascio, 1994). Besides, it makes it easier for different stakeholders, such as shareholders, government regulatory agencies, insurance companies, and financial institutions, to assess a certified company’s commitment to both improving environmental performance and minimizing risks (Donaldson, 1996). In addition, since ISO14001 certification is voluntary, companies have more flexibility in developing their EMSs, according to their operations, characteristics, location, and levels of risk, unlike environmental regulations (Rondinelli and Vastag, 1996).

The ISO14001 series is an internationally-recognized management standard, under which participating firms are required to create a (environmental) management system in order to meet specific goals and objectives. However, there are also other environmental

procedures, processes and resources for developing implementing, achieving, reviewing and maintaining an environmental policy.

⁵ According to Poksinskia et al (2003), ISO14001 is often wrongly called an “environmental standard”. Its aim is not to measure any environmental effects or to ensure that those are minimized. Rather, it should be seen only as a framework for identifying and managing performance criteria that are set by organizations implementing the standard. It is a process for managing company activities that have an impact on the environment. Organizations must have a procedure to review those activities in order to manage them efficiently.

management certifications designed for companies in Hong Kong. The Environmental Labels and the Sectoral Awards under Hong Kong Awards for Environmental Excellence (HKAEE) are some of the more well-known examples.

2.2.2 Hong Kong Awards for Environmental Excellence (HKAEE)

HKAEE is a merger and extension of three former environmental award schemes, namely the Hong Kong Eco-Business Awards, the Wastewi\$e Scheme, and the Hong Kong Energy Efficiency Awards. Commenced in 2008, the HKAEE is led by the Environmental Campaign Committee (ECC) alongside the Environmental Protection Department and in conjunction with nine organizations, namely, in alphabetical order, the Advisory Council on the Environment, the Business Environment Council, the Chinese General Chamber of Commerce, the Chinese Manufacturers' Association of Hong Kong, the Federation of Hong Kong Industries, the Hong Kong Chinese Importers' & Exporters' Association, the Hong Kong Council of Social Service, the Hong Kong General Chamber of Commerce and the Hong Kong Productivity Council.

According to HKAEE, the Hong Kong Awards for Environmental Excellence aims “to encourage businesses and organizations to adopt green management and green innovations, as well as to present them with an opportunity to benchmark their commitment towards environmental excellence.” Currently, four schemes are being offered, namely, “Environmental Labels”, “Carbon “Less” Certificates”, “Sectoral Awards”, and “Green Innovations Awards”. Within the context of property management, only the Environmental Labels and the Sectoral Awards are focused and information of these schemes is to be further presented in the following sections.

2.2.2.1 Environmental Labels

The Environmental Labels scheme, consisting of four different labels, offers recognition to those that have achieved goals in waste reduction, energy conservation, improving indoor air quality (IAQ) and improving environmental attributes of their products. The four labels are the Wastewi\$e Label, the Energywi\$e Label, the IAQwi\$e Label, and the Productwi\$e Label, respectively. Nonetheless, it should be noted that, within the context of property management, only the first three labels are applicable. Therefore, the following presentation only focuses on these three.

Regarding the Wastewi\$e Label, it is a recognition scheme established to encourage Hong Kong businesses / organizations in adopting measures to reduce the amount of waste generated within their establishments or generated through the services and products they provide; and recognize the waste reduction efforts of those companies. Assessment is based on the amount of goals per year a particular company is able to achieve on either two of the following three measuring categories: i) Waste Avoidance & Reduction Measures; ii) Collection & Recycling of Recyclable Materials; and iii) Purchase or Manufacture of Recycled Products. This label is very popular in the property management sector. As of late September 2012, 881 (67.2%) out of 1,313 active participants of the label are property management companies.

Concerning the Energywise Label, it is a recognition scheme established to encourage Hong Kong businesses / organizations in adopting measures to save energy within their establishments and recognize the energy saving efforts of those companies and organizations. Companies that are assessed for the Energywise Label are required to achieve certain amount of energy saving measures in different energy consuming facilities. As of late September 2012, 168 (54.9%) out of 306 active participants of this label are property management companies.

The third label, the IAQwise Label, is a recognition scheme established to encourage and recognize participants implementing or achieving IAQ standards beyond certification requirements of the IAQ Certification Scheme in order to further enhance indoor air quality at offices and in public places in Hong Kong. Unlike the Wastewise and Energywise Labels which emphasize goals or measures, those participating in the IAQwise Label are required to obtain certification under the IAQ Certification Scheme by the Government. For companies in pursuit of the “Class of Excellence” under this Label, they are also required to “demonstrate achievement(s) in education or promotion of IAQ awareness amongst stakeholders or general public”. Although there are not as many active participants of this Label as compared to the Wastewise and the Energywise Labels, interestingly the vast majority of those participants are within the property management industry (116 out of 146, or 79.5% by late September 2012).

2.2.2.2 Sectoral Awards

The Sectoral Awards scheme, purporting to 1) encourage business and organizations to adopt green management; 2) benchmark their commitments towards best practices within their sectors; and 3) recognize and acknowledge the efforts of leading businesses and organizations, grants awards to organizations of designated sectors with an overall outstanding environmental performance.

Organizations and companies of 11 different sectors are eligible for this award, including the property management sector. The assessment criteria for the Sectoral Awards are based on the “Eco-Business Model”, designed to exemplify the strong relationship between the internal workings of a business and the surrounding environment. The key factors, including Green Leadership, Programme and Performance, and Partner Synergy, are generally considered to be vital in the overall integration of environmental measures within an organization. Within the context of property management, Programme and Performance is the most important factor in the assessment of this award (45%), followed by Partner Synergy (35%) and Green Leadership (20%). After three stages of assessment, a gold award, a silver award, a bronze award, a SME⁶ award, and certificates of merit would be given out to selected companies.

⁶ An SME refers to a manufacturing company with less than 100 employees in Hong Kong; or a non-manufacturing company which employs less than 50 persons in Hong Kong.

3. Research Method and Data

3.1 Method

Residential property is a commodity the price of which can be a function of some broader categories such as structural, environmental, or managerial attributes. Those broader attributes are composed of smaller characteristics such as area, floor, view, transport, property management service, etc., thus rendering it a non-homogeneous commodity (Sirmans et al., 2005). The price of a housing unit can be estimated as a function of these characteristics. Hedonic Pricing Method is a typical method to analyze this kind of non-homogeneous commodity, as it allows the total value to be broken down into the values of individual components. Moreover, it can also be used to identify the separate effect of these individual characteristics. In this study, this model is used to analyze the functional relationship between property price and property management service along with these individual housing characteristics.

The power of Hedonic Pricing Model lies in its ability to consider the implicit relationship between the commodity and the characteristics that are assumed to constitute it (Freeman, 1979). In other words, it can provide with the idea of any additional expenditure required to purchase the commodity (i.e. property) with a marginally larger quantity of that characteristic.

Hedonic Pricing Model is usually location-specific and hence difficult to generalize across different locations. Therefore, they are generally used for an understanding of a particular market. However, on the other hand, it can also give ideas about those characteristics which are consistently valued by buyers across different locations.

To test whether a buyer will pay a premium on a property which has quality property management service, the transaction records (hence the record of “price”) of properties managed by property management companies with or without the certifications/awards we intend to study is used in this model. The data come from secondary sources such as from property agencies and government publications, which is a usual practice (Bourassa et al., 2006). An actual market survey would involve significant manpower and time, and is likely to yield similar or less convincing output than that done by these companies along the years. In order to simplify the model and make a more accurate result on the effect of property management services, the impact of geographical characteristics and differences in income are nullified by using a sample with similar location and income groups.

There can be a limitless number of independent variables that can be included in the model. However, only few housing attributes are carefully selected which have significant effect on this context and also are not directly influenced by the property management services. As a result it can also demonstrate a comparative view between the impact of housing attributes and the quality of property management services. The collected data are then analyzed by a typical semi-log form of Hedonic Pricing Model with the price specified in natural logs and regressed against a set of logged or quadratic (for those with non-linear relationships) and another set of unlogged (for those with linear relationship with price) variables. Then they are associated with their expected positive or

negative signs. The variables were categorized in three categories, i.e. property-related, management-related, and location-related. A description of the selected variables is shown in Table 1 below.

Attributes	Abbreviation	Definition	Expected Relationship with property price (+/-)
Dependent Variable			
	LnP	Price of apartment per sq.ft in HK\$ in natural log form	/
Independent Variables			
Property-related	LnAREA	Usable floor area in square feet in log form	+
	AGE	Age of the residential unit (in years) when the transaction took place	-
	BLK	Number of blocks in the residential development	+
	FLR	Floor-level of residential unit	+
	SEAVIEW	Dummy variable; 1 if the unit has a sea view; 0 otherwise	+
	MTR	Dummy variable; MTR station 1 if it is within 10-minute walking distance to the MTR station; 0 otherwise	+
General Management-related	ISO9001	Dummy variable; 1 if the company which manages the estate is ISO 9001-certified; 0 otherwise	+
	HKMAQA	Dummy variable; 1 if the company which manages the estate has obtained both ISO9001 and ISO14001 certifications; 0 otherwise	+
	QM	Dummy variable; 1 if the company which manages the estate has obtained the Hong Kong Q-Mark service certification; 0 otherwise	+
	EMSC	Dummy variable; 1 if the company which manages the estate has won one of the Estate Management Services Contractors Awards from the Hong Kong Housing Authority; 0 otherwise	+
Environmental Management-related	ISO14001	Dummy variable; 1 if the company which manages the estate is ISO 14001-certified; 0 otherwise	+
	HKAEE	Dummy variable; 1 if the company which manages the estate has obtained either the Environmental Labels or Eco-business awards (before 2008); 0 otherwise	+
	SA	Dummy variable; 1 if the company which manages the estate has obtained the Sectoral Award under HKAEE; 0 otherwise	+
Location-related	HKI	Dummy Variable; 1 if the residential unit is located on Hong Kong Island (i.e., Tai Koo Shing and Quarry Bay), 0 otherwise	+
	KOW	Dummy Variable; 1 if the residential unit is located in Kowloon (i.e., Cheung Sha Wan), 0 otherwise	+s

Table 1: Description of selected variables

3.2 Data

Three districts: Tai Koo Shing/Quarry Bay (Hong Kong Island), Cheung Sha Wan (Kowloon), and Shatin (the New Territories) are chosen for investigation (for the location of property estates selected, see Figures 2-4). The sample includes all transactions of residential flats within 16 residential buildings/estates between the third quarter of 2011 and the second quarter of 2012, during which 312 transactions had been recorded.



Figure 2: Location of selected residential estates (Tai Koo Shing/Quarry Bay) (Source: Google Map)

- 1: Splendid Place
- 2: Bo Fung Gardens
- 3: Park Vale
- 4: Kornville
- 5: Mount Parker Lodge

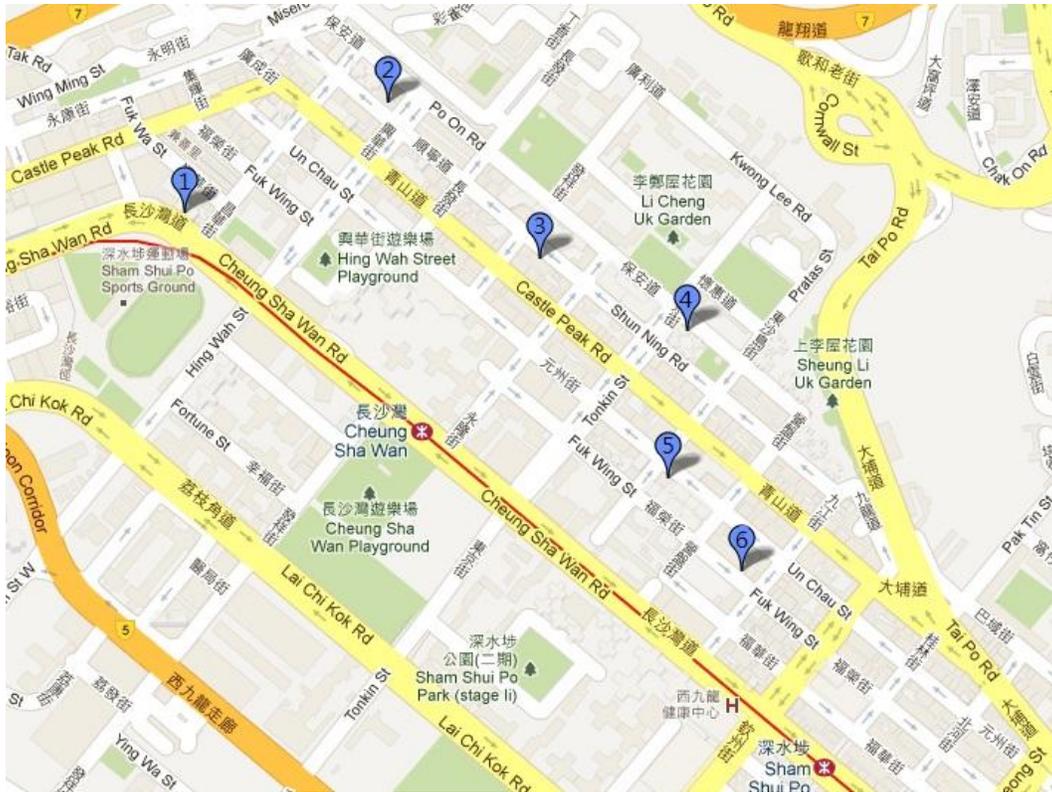


Figure 3: Location of selected residential estates (Cheung Sha Wan) (Source: Google Map)

- 1: Charming Garden
- 2: Beacon Lodge
- 3: Peaceful Mansion
- 4: Merlin Centre
- 5: Manor Centre
- 6: Sun Yee Mansion



Figure 4: Location of selected residential estates (Shatin) (Source: Google Map)

- 1: Lucky Plaza
- 2: Shatin Centre
- 3: New Town Plaza
- 4: Hilton Plaza
- 5: Scenery Court

As for the data, transaction records of these residential units, which include transaction price, age of building, the amount of blocks within the residential development, floor area and floor level of the transacted unit, are obtained from the website of Centaline Property (Centaline, 2012) and of Midland Realty (Midland, 2012), are used for the analysis. Regarding transaction price, those included in the sample have been inflation-adjusted with reference to the private domestic property index, compiled by Rating and Valuation Department, as of June 2012. In addition, information regarding the various certifications/awards are obtained from websites of companies involved in the property management of these selected estates and from those of organizations which introduce these certifications and awards, for instance the HKAEE, the HKMA, the International Organization for Standardization (ISO), as well as the Federation of Hong Kong Industries (for the Hong Kong Q-Mark Schemes).

4. Findings

Prior to the presentation of findings generated by the hedonic regression model, some basic statistics of the sample are to be reported first (Table 2). Of the 312 residential properties included in the sample, their transaction prices, before being inflation-adjusted, range from HKD 1.8 million to HKD 10 million, with a mean value of 3.49 million Hong Kong dollars. The largest housing unit of the sample is 1,186 sq. ft. and the smallest housing unit is 338 sq. ft.; in addition, the average size of the sampled properties is 531.7 sq. ft. The highest flat of the sample is located on the 42th floor, while the lowest flat is located on the first floor. Interestingly, the vast majority of flats included in the sample do not have a seaview. With regard to accessibility, roughly 90% of flats in the sample are within a 10-minute walking distance to one of the MTR stations. Concerning age, the newest residential building is 4 years old and the oldest is 40, and the average age of residential buildings in the sample is 25.3 years. The sample also includes flats of individual buildings and those of large residential estates with as many as 8 buildings; the average number of buildings in those residential developments in the sample is 5.45.

	Min	Max	Mean	Std. Deviation
Price	1800000	10000000	3490000	1529683.858
AREA	338	1186	531.65	160.780
FLR	1	42	13.49	8.455
Sea View	0	1	.00	.057
MTR	0	1	.90	.295
Age	4	40	25.29	7.026
Block	1	8	5.45	2.591
N	312			

Table 2 - Descriptive Statistics of sampled residential units

In regards of general management certifications/awards (Figure 4), 63.5% of flats in the sample are managed by ISO9001-certified PM companies; 27% of flats by those which are HKMAQA winners; 22.8% of all flats in the sample are being managed by companies which have been awarded with the Estate Management Services Contractors Award; and 49% of flats in the sample are managed by property management companies with Q-Mark Service Certification. As for environmental management certifications and awards, 61% of flats by ISO14001-certified property management companies; 37% of properties by those with either HKAEE's Environmental Labels or Eco-business awards; and 25% of flats by winners of the HKAEE's Sectoral Award.

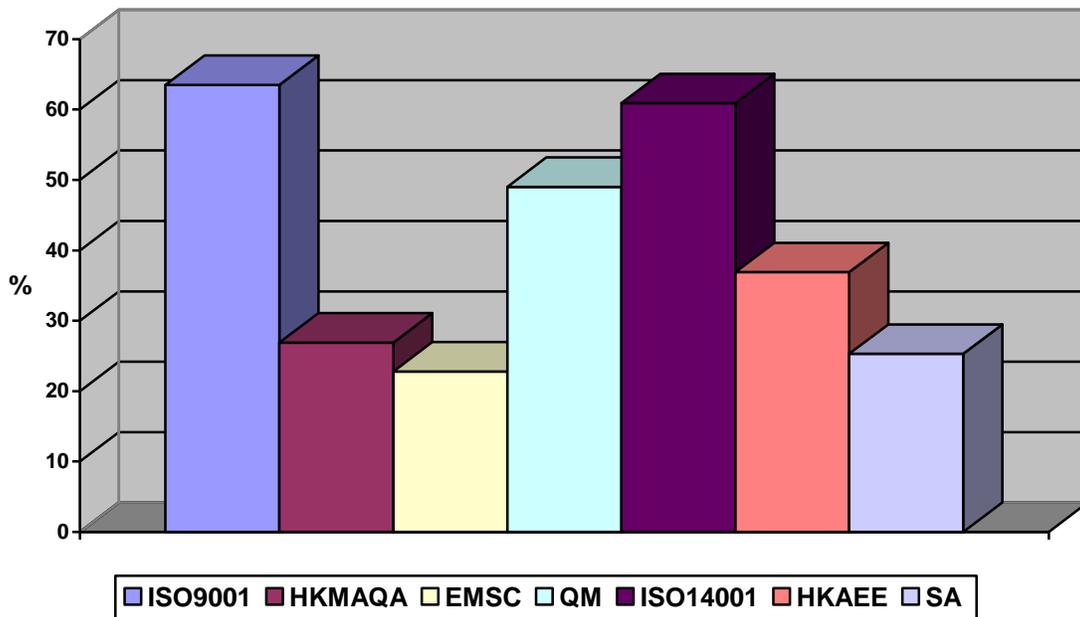


Figure 4: Percentage of residential flats managed by property management companies (by certificate/award)

The results generated by the hedonic pricing model are presented in Table 3 below. The adjusted R-square of the model is 0.799, suggesting that it is able to explain close to 80% of the variance in the dependent variable, that is, the transaction price. The respective impacts of selected explanatory variables are to be discussed in the following paragraphs.

The results generated by the hedonic model are presented in Table 4 below.

Variables	Coefficient	T-value
Constant	8.541 (5120.46)***	50.342
Property-related attributes		
LnAREA	.019 (1.019)	.762
AGE	-.009 (0.991)***	-7.993
BLK	.029 (1.029)***	10.006
FLR	.002 (1.002)***	3.368
SEAVIEW	-.024 (0.976)	-.293
MTR	.052 (1.0533)**	2.142
General Management-related attributes		
ISO9001	.025 (1.025)	.717
HKMAQA	.457 (1.579)***	13.578
EMSC	-.398 (0.672)***	-7.688
QM	.183 (1.201)***	6.502
Environmental Management-related attributes		
HKAEE	-.017 (0.983)	-.679
SA	-.046 (0.955)	-1.319
ISO14001	-.056 (0.946)	-1.398
Location-related attributes		
HKI	.293 (1.340)***	15.933
KOW	-.054 (0.947)***	-2.886
Adjusted R-square	0.799	
F-statistic	83.135	

Table 4: Hedonic model results

Notes: 1) *** denotes significance at 1%; ** at 5%; 2) As the original coefficients are in natural log form, the reverse natural log form of these coefficients are also provided (in brackets).

Management-related attributes

For the management-related attributes, the results, surprisingly, illustrate that all environmental management-related attributes, as well as ISO9001, are not significant in explaining the transaction price of properties in this sample. The insignificance of ISO9001 in affecting property price differs from the findings in Hui et al. (2011), in which it is concluded that people are willing to pay 4.92% more on properties managed by companies with such a certification. The reason behind such disparity can be attributed to 1) different samples are being used for the respective investigations; and 2) Hui et al. (2011) only studies the impact of ISO9001 and of HKMAQA on property price, without controlling for the effects of other certifications/awards, such as Q-Mark and Estate Management Service Contractors Awards (as required in the proposal) as well as the environmental management certifications/awards selected for this study.

Meanwhile, for the general management-related attributes, three of the selected certifications and awards yield significant (at least at 5%) impacts on the resultant per sq. ft transaction price, two of which being positive and one being negative. For certifications and awards which induce positive effects on property price, a housing unit located in a building which is managed by a property management company with HKMAQA is about 57.9%⁷ more costly than that by a company without those qualifications. Then, a flat that is located in a building managed by a PM company that has obtained the Q-Mark service certifications about 20.1% more expensive than that by a property management company without it. By contrast, a flat located in a building managed by a PM company with the Housing Authority's Estate Management Service Contractors Award, surprisingly, has a per sq. ft price about 32.8% lower than another flat by a company without it. To sum up, of the management certifications/awards, the HKMAQA is the most instrumental as a value-adding management-related tool, followed by the Q-Mark Service Certificate. Meanwhile, the Estate Management Service Contractors Award appears to lead to a lower property price, regardless of the other attributes of residential properties.

Property-related attributes

As for the selected property-related attributes, all but the seaview attribute are significant at least at 5%. Among the significant variables, four of which are positively correlated to the inflation-adjusted per square feet transaction price, and one of which is negatively correlated.

For those attributes which have positive impact on property price, accessibility to MTR station provides the biggest positive impact, as a residential unit which is within 10-minute walking distance to an MTR station is 5.3% more expensive than one without the same attribute. Then, the results also report that a 1% increase in the floor area of a property results in a 1.9% increase in the per square feet transaction price. In addition, the number of blocks inside a residential estate also has a positive effect on the price of properties. It is shown that this attribute provides an impact of 2.9% per block on the resultant transaction price. This seems to suggest that flats inside large property estates appear to be more popular among homebuyers, in comparison to those inside smaller estates (or those consisting of only one building). The positive effect of floor level, at 0.02% per level, on transaction price points out that a housing unit located on a higher level is likely to be transacted at a higher price than others on lower levels. The only attribute with a negative correlation with property price is age, which means that, holding other attributes constant, prices of older housing units are lower than those of new units at a rate of 0.9% per year. To sum up, the respective impacts of these housing attributes are in line with what are expected of them.

⁷ It should be noted that the interpretation of results in the following paragraphs are based upon the reverse natural logs of coefficients (in brackets) shown in Table 3.

Location-related attributes

Regarding the effect of location of residential units on property price, the findings report that, holding other things constant, flats located on Hong Kong Island are expectedly the most expensive. Those units are about 34% more costly than others located in the New Territories, and 39.3% than those in Kowloon, respectively, keeping other factors constant. That housing units in the New Territories appear to be more expensive than those in Kowloon may attribute to the fact that properties selected for the New Territories sample are located in one of the new towns in Hong Kong, while those selected for the Kowloon sample are located in a relatively old urban district.

5. Conclusion

Findings

This study has assessed the impact of various management certifications (and awards) on the price of residential properties located in selected districts of Hong Kong. The findings show that:

- ISO9001 certification is not significant in explaining the transaction price of sampled properties.
- The HKMAQA and the Hong Kong Q-Mark certificate have positive impacts on property price.
- The Estate Management Services Contractors Award appears to have a negative effect on property price.
- ISO14001 as well as both Sectoral Awards and Environmental Labels under the HKAWW are not significant in explaining price of residential properties.
- Property-related attributes such as size of unit, the number of blocks in the estate, floor level, and accessibility to MTR station are positively-correlated with property price, while the flat's age has a negative relationship with its price.

Implications

In light of the findings, there are a number of implications worth discussing. Firstly, with regard to the insignificance of all environmental management certifications and awards in explaining housing price, it may be due to the insufficient awareness in environmental preservation among Hong Kong residents, in comparison to residents in other foreign countries. Although the government, through the Environmental Protection Department (EPD), has been actively promoting waste reduction, as well as encouraging public participation in the recycling of various materials⁸ and in the source separation of domestic waste, the impact of these promotional efforts, unfortunately, is less than desirable. According to the EPD, domestic solid waste disposal has amounted to at least 44% of all solid waste disposals in Hong Kong since 2006. Without the sense of environmental preservation on the part of the community itself, there is simply a lack of demand for environmental-friendly operations on the part of companies, as reflected by the insignificant impact of those certifications/awards on property price.

Secondly, as for the reason behind the insignificance of the ISO series (both 9001 and 14001) on property price is that, unlike HKMAQA which is primarily performance-oriented, what an ISO certification demonstrates is that the essence of ISO is a systematic way of management, which does not necessarily mean that property companies with those certifications actually perform better than those without them. Besides, the lack of information disclosure relating to a company's management systems under the ISO banner makes it very difficult for those who are not familiar with the standard to accurately assess what it has actually accomplished (see Morrison et al., 2000; Gleckman and Krut, 1997). In short, what an ISO certification actually brings to the table is less known by the public, rendering its effect uncertain in the process.

⁸ For instance, fluorescent lamps, computers, electrical and electronic equipments, rechargeable batteries, etc.

Thirdly, from the customers' point of view, it appears that local awards and/or certifications issued such as HKMAQA and Q-Mark more accurately represent the level of performance by property management companies, as reflected by their large positive impact on transaction price. It is believed to be the result of the promotional effort(s) on the part of the Hong Kong Management Association (for HKMAQA winners) and of the Hong Kong Q-Mark Council (for Q-Mark companies), and of their established brand-name effects, both of which are instrumental in helping these companies to reach the general public, as well as in boosting these companies' public image within the Hong Kong community. In addition, unlike ISO certification(s), both HKMAQA and Q-Mark are regarded as indicator(s) of excellence not only by industry professionals, but also by the general populace as well; and since the intention of this study is to gauge the public's (more specifically, the homebuyers') perceptions of these management certifications/awards, it is not surprising that the HKMAQA and Q-Mark yield positive impacts on housing price while the ISO certifications do not.

The fourth implication relates to the negative impact of the Housing Authority's Estate Management Services Contractors Awards on housing price. This finding is at odds with the idea that certifications/awards mean better management performance, and thus are associated with higher property price, at least from the perspective of the customers. Nonetheless, this anomaly can be explained by means of the nature of the award itself. It is limited to property management of public rental housing and of HOS estates. According to the Housing Authority, the determination of award winners is based on four elements: 1) the scores given by an assessment panel; 2) Housing Department supervisory teams; 3) the feedback from Estate Management Advisory Committees; and 4) the results of random surveys conducted among residents". One might argue that the preferences of public housing residents (and of government bureaucrats) towards property management could very well differ from those of private housing residents, the sample group of this particular study. In other words, due to disparity in expectations, private housing residents might not have the confidence towards the level of property management that constitutes quality management for public housing estates as such for private sector housing. In a sense, private residents do not view this award, which is an award for public housing, with a sign of approval, as reflected in its negative impact on private housing price.

Limitations

Due to time and resource constraints, the sample size (312 flats located in 16 residential estates across three districts) is considered small. The results, hence, may not be representative as to how various general management environmental management certifications/awards impact the price of flats in other areas, or that of different kinds of properties, in Hong Kong.

Directions for future studies

Besides a more representative and comprehensive investigation of this topic among residential properties located in various parts of Hong Kong, future studies could also look at how building-specific certifications/awards, such as BEAM⁹ and the Green Building Award¹⁰, might influence property value.

⁹ BEAM is owned and operated by BEAM Society Limited, which is an independent non-profit organization, with its membership being drawn from many professional and interest groups in Hong Kong's building construction and real estate sectors. The BEAM scheme, established in 1996, has two assessment methods, one for 'new' buildings and the other for 'existing' buildings. According to the BEAM society, it aims to 1) enhance the quality of buildings in Hong Kong; 2) stimulate demand for buildings that are more sustainable, giving recognition for improved performance and minimizing false claims; 3) provide a comprehensive set of performance standards that can be pursued by developers and owners; 4) reduce the environmental impact of buildings throughout their life cycle; and 5) ensure that environmental considerations is integrated right at the design and planning stages. It emphasizes indoor environmental quality and amenities as key performance indicators, with proper consideration of the local, regional and global environmental impacts. A building which is BEAM-certified is expected to be safer, healthier, more comfortable, more functional and more efficient than a similar building that does not achieve the level of performance prescribed in BEAM. As of Oct 2009, BEAM had already provided recognition for improved building performance in more than 200 landmark properties in Hong Kong, comprising over 9 million m² and 50,000 residential units.

¹⁰ The Green Building Award is a biannual award, organized by the Hong Kong Green Building Council (HKGBC), along with the Professional Green Building Council (PGBC), to "provide recognition to building-related projects with outstanding performance and contributions in sustainability and the built environment and to transform the mainstream market towards wider adoption of sustainable planning, design, construction, management, operation, maintenance, renovation and decommissioning of buildings". The objectives of the Green Building Award are to "provide recognition to building-related projects with outstanding contributions in sustainability, and to encourage adoption of sustainable planning, design, construction, management, operation, maintenance, renovation and decommissioning of buildings". As for the assessment criteria, they are divided into the categories of quality, resources, sustainability, and innovation.

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(http://www.industryhk.org/english/fs/fs_qmark/fs_qmark_ser.php)

The Hong Kong Awards for Environmental Excellence

(<http://www.hkaee.org.hk>)

The Hong Kong Management Association Quality Award

(<http://www.hkma.org.hk/qa/award.htm>)

The Estate Management Service Contractors Awards

(<http://www.housingauthority.gov.hk/en/business-partnerships/quality-housing/estate-management-services-contractors-awards/>)

BEAM Society

(http://www.beamsociety.org.hk/en_index.php)

Green Building Award

(<http://www.gba.hk/main.html>)