International Journal of Development and Sustainability
ISSN: 2186-8662 – www.isdsnet.com/ijds
Volume 6 Number 8 (2017): 650-666
ISDS Article ID: IJDS17080708

Benchmarking property management agents' performance in Hong Kong

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Abstract

Management of multi-owned housing (MOH) is often complicated so it is very common that third-party property management agents (PMAs) are engaged in the management process. However, not all the PMAs perform well. This article aims to develop a protocol for evaluating and comparing the performance of PMAs in managing MOH developments in Hong Kong. Based on the literature reviewed, a two-stage data envelopment analysis (DEA) model was developed for the evaluation of PMA performance. The model used a number of input-based and output-based indicators to generate the performance indices for different PMAs. Data were collected through building assessment and structured questionnaire surveys in 37 MOH developments in Hong Kong. The article demonstrates that the DEA-based benchmarking approach can have applications which are beneficial to all stakeholders in the field of property management. Moreover, the research findings imply that staff training or development played an important role in determining the performance of PMA. Even when a PMA was good at building capacity for property management, its service delivery might be not satisfactory if its staff were not well-trained. The study is the first attempt to empirically evaluate and benchmark the performance of PMAs in Hong Kong using the DEA technique.

Keywords: Benchmarking; Data Envelopment Analysis; Housing Management; Multi-Owned Housing; Property Management Agents

Cite this article as: Yau, Y., Ho, D.C.W. and Li, R. (2017), "Benchmarking property management agents' performance in Hong Kong", *International Journal of Development and Sustainability*, Vol. 6 No. 8, pp. 650-666.

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1. Introduction

For many reasons including increasing land-use efficiency and containing urban sprawl, high-rise development pattern has been adopted in many American and Asian cities such as Chicago, New York, Hong Kong, Singapore, Shanghai and Taipei (Yeh and Yuen, 2011). In these high-rise cities, private housing is predominantly represented by multi-owned housing (MOH) like apartments, condominiums and strata-title developments. Although MOH of all these types are held in multiple ownership, the ownership or title arrangements are quite different. For example, apartments in Hong Kong are held in the co-ownership system while the Singaporean counterparts are held in the strata-title system (Hastings et al., 2006). Yet, they share one similarity: some elements or parts of a housing development are co-owned and shared by the homeowners. For these common or communal elements, all homeowners in the housing development are collectively responsible for their management and upkeep. In high-rise MOH, these common elements include building services like water pumps, service ducts and lifts and communal areas like staircases, entrance lobbies and clubhouses. In addition to the use and operation of these tangible elements, management of a MOH development also concerns various aspects such as security, quietness and environmental cleanliness. On account of the sophistication of building services installed, sizeable area of communal area and large number of residents involved, managing a high-rise MOH development often demands a lot of manpower and professional skills (Chen and Webster, 2005; Hui, 2005). It is often not an easy task for the homeowners to manage the housing development themselves. Moreover, time constraints of the homeowners may disable self-management of MOH developments (Leung, 2005).

The mode of third-party management has been advocated by various governments, professional bodies and scholars to avoid mismanagement of MOH developments (Chan, 2006; Loo, 1991; Ho et al., 2006; Ho and Liusman, 2016). A third-party agent, which is commonly called property management agent (PMA), is usually engaged for performing various tasks in housing management such as cleaning, security, repair and maintenance and financial management. In Hong Kong, PMA is appointed to perform housing management tasks in varying scopes in approximately 60% of apartment buildings. Other than the service agreement, the responsibilities and rights of a PMA are laid down in the Building Management Ordinance (Chapter 344 of the Laws of Hong Kong) and the deed of mutual covenant (DMC). In spite of the advantages of contracting out management tasks to a PMA (e.g. saving time and buying in expertise), the third-party management mode has its own downsides. The appointment of a PMA is "in itself no guarantee of the professionalism of the services provided" (Christudason, 2008: 100). As put forward in many works like Guilding et al. (2005), Rosenberg and Corgel (1990) and Yip et al. (2007), this management mode is vulnerable to the agency problem. In nearly all the cases, PMAs, who are agents in property management, strive to maximize their own profits or interests (Klingenberg and Brown, 2006). They may not act in best interests of the homeowners who are the principals. For example, a PMA has no incentive to help homeowners to save energy in the communal areas of a MOH development when its remuneration is calculated as a percentage of the total expenses incurred in the management of the development. The PMA may also collude with the bidders when helping homeowners to procure different goods or services. In some other cases, the PMAs divert or

misappropriate the reserve funds in the property management account. These malpractices of the PMAs have been widely covered by the media in Hong Kong (e.g. Lau, 2015; The Sun, 2013).

In order to raise standards and enhance professionalism, the Hong Kong government proposed to implement a licensing regime for the property management industry in 2010 (Home Affairs Department, 2010). After several years of public consultation and law-making process, the Property Management Services Ordinance was enacted in May 2016 and the Property Management Services Authority was set up accordingly. In fact, aside from the statutory and regulatory framework, the agency problem in MOH management in Hong Kong can be solved with a market approach. When the general public is fully informed of the PMAs' performance, mal-practising or poorly-performing PMAs will be crowded out by market forces. To this end, it is necessary to better understand and evaluate the management performance of PMAs. Once the performance of PMAs can be benchmarked, the homeowners can be better informed in the choice of PMAs. Against this background, this article proposes a protocol for evaluating and benchmarking performance of PMAs in MOH management in Hong Kong.

The article is organized as follows. The practices of measuring and benchmarking the performance of PMAs are reviewed. It is followed by an outline of the proposed analytical framework for PMA performance benchmarking. Afterwards, the design of the research is detailed. The analysis results are then presented. Implications of the research findings and research limitations will be discussed before the article is concluded.

2. Current measures of PMA's performance

In the field of property or housing management, research on performance evaluation or measurement has a short, thirty-year history. It started in the mid-1980s and the early-day research primarily focussed on social or public housing (Kemp, 1995). However, Kishk et al. (2004, 2005) call attention to a dearth of balanced understanding of property performance measurement. They point out that most of the existing literature "does not consider performance measurement of property from the established viewpoint of property management but are rather inclined towards facilities management and corporate real estate management" (Kishk et al., 2015: 159). PMA's performance in housing management has been largely ignored in previous studies.

Conceptually, research on property management performance can draw on an analogy with industrial production. As Figure 1 shows, whether it be in the production of industrial goods or property management services, inputs are combined in various ways and in various amounts to produce a quantity of outputs. The outputs are then purchased or otherwise obtained by customers and used by them to enhance their well-being. The term "inputs" describes the resources required by each production process which, in the case of property management, includes both tangible resources, such as the capital and labour required for service provision, and intangible resources such as the organizational context and level of staff training. The level of intangible resources will influence and be influenced by the level of tangible resources but is logically distinct. By definition, intangible resources are much harder to quantify so it is questionable whether the level of

intangible resources can be proxied from conventional sources. The term "outputs" refers to the results of the production process which, in the example of the property management, is measured initially in terms of the frequencies of management activities (cleaning of communal areas and security patrol) in a specified time period. However, these characteristics of service are "immediate outputs" of the property management process. The service provided by each PMA is unlikely to be homogeneous and therefore differences in the quality of service must be recognized and examined. Therefore, the subsequent effects the use of the service has on the consumers are the "final outputs" which include resident satisfaction and building conditions.

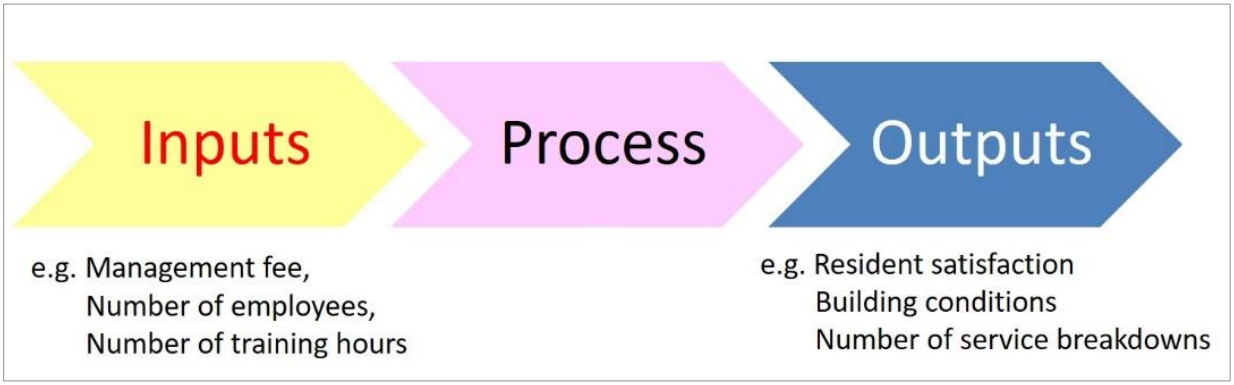

Figure 1. The "production" of property management services

The review of the works done on performance measurement of a PMA in the past thirty years reveals that many key performance indicators proposed or used are either input-based or output-based. Input-based measures include number of direct personnel deployed in the property management process, number of professional licenses the PMA has and hours of staff training (Chen et al., 2015; Price and Clark, 2009; Wu and Chen, 2012). Conversely, output-based measures which rely on assessable outcomes of property management process include customer satisfaction and building conditions (Kuo et al., 2011; Lam, 2008; Price and Clark, 2009; Wu and Chen, 2012). Nonetheless, these two approaches of PMA performance measurement are not free of limitations. Input-based measurement ignores the outcomes of property management which homeowners, residents or service customers concern most in many cases. Output-based measurement disregards certain important factors that may affect the outputs of property management process. It does not discern the level of inputs required to achieve a specific level of outputs. For instance, keeping other things constant, a PMA manned with ten staff should have a better performance than another PMA with twenty staff if the two PMAs share the same level of resident satisfaction.

In response to the limitations of the input-based and output-based measures, some studies propose hybrid measures which essentially integrate the uses of input-based and output-based indicators. The hybrid measures usually come in a format of multi-attribute evaluation tool (Kuo et al., 2011; Pan and Liu, 2010; Ho and Liusman, 2016). The hybrid measurement is apparently promising but the hierarchical organization of the assessment factors is rather rigid. Besides, the predetermined weightings of assessment factors are not

universally applicable. For example, the factor weightings for high-rise luxury apartment buildings can be different from those for medium-rise subsidized ownership housing. In this regard, a more flexible but scientific method to evaluate the PMA performance in MOH management is warranted.

3. Benchmarking PMA's performance using a data envelopment analysis method

To reiterate, this article aims to develop a new protocol for evaluating and benchmarking performance of PMAs in MOH management in Hong Kong. To achieve this end, the data envelopment analysis (DEA) method is adopted.

3.1. An overview of the DEA method

The DEA method is a non-parametric, deterministic linear programming technique that is applied for empirical measurement of performance of multiple decision-making units (DMUs). It measures how efficiently a DMU uses the resources available to generate a set of outputs. In the DEA method, the performance of DMUs is evaluated using the concept of efficiency or productivity which is defined as a ratio of quantity of total outputs to quantity of total inputs. The idea of DEA was first put forward by Charnes et al. (1978) and the method was then further developed by Banker et al. (1984) and many other scholars. The basic idea of the DEA is that a "best-practice frontier" is created with a data-oriented approach (Cook et al., 2014). As shown in the simple example in Figure 2, the levels of output and input of seven DMUs are plotted in a graph. The frontier, represented by the broken line, connects all the relatively most efficient DMUs in the pool (i.e., DMUs A, B, E and F). This data-sensitive frontier denotes the theoretically possible optimal output that a DMU can achieve with a specific level of input. Those DMUs lying beneath the frontier (i.e., DMUs C, D and G) are inefficient units or poor performers. For DMU C, it is not efficient because it uses relatively more inputs to produce the same quantity of outputs as the other DMUs on the frontier. Point C' represents the optimal output level when DMU C reduces its input level in order to achieve the same level of outputs. On the other hand, point C" symbolizes the supposed output level given the same input level in order to achieve optimality.

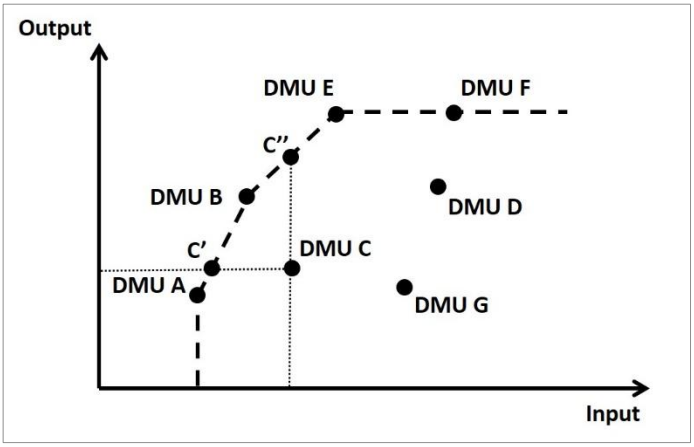

Figure 2. An illustrative "efficient frontier"

From Figure 2, it is clear that the estimated frontier characterizes the optimal performance of DMUs. That is why Charnes et al. (1978) describe DEA as an optimization-based technique. It measures the performance of a DMU relative to the best performers rather than the mean or central tendency (Sherman, 1984). The DEA method has been popularly employed in many other disciplines for firm or organization performance evaluation (e.g. Bayraktar et al., 2012; Jacobs, 2001; Köksal and Aksu, 2007; Mannino et al., 2008; Yue, 1992). It gains popularity for its merits. For example, the method can handle multiple inputs and outputs and does not require an assumption about functional form (Boussofiane et al., 1997). The measurement units of inputs and outputs need not to be homogeneous. In addition, DMUs are directly benchmarked with their peers.

3.2. A two-stage DEA model

In this study, a two-stage DEA model is developed to evaluate the performance of PMAs in MOH management in Hong Kong. Unlike the traditional single-stage model, the approach adopted in this study splits the property management process into two interrelated components: capacity building and service delivery. As shown in Figure 3, in the first stage, each PMA inputs financial resources into the management system to acquire manpower and generate financial reserves for operating a MOH development. In the second stage, manpower and financial reserves are transformed into outputs of property management.

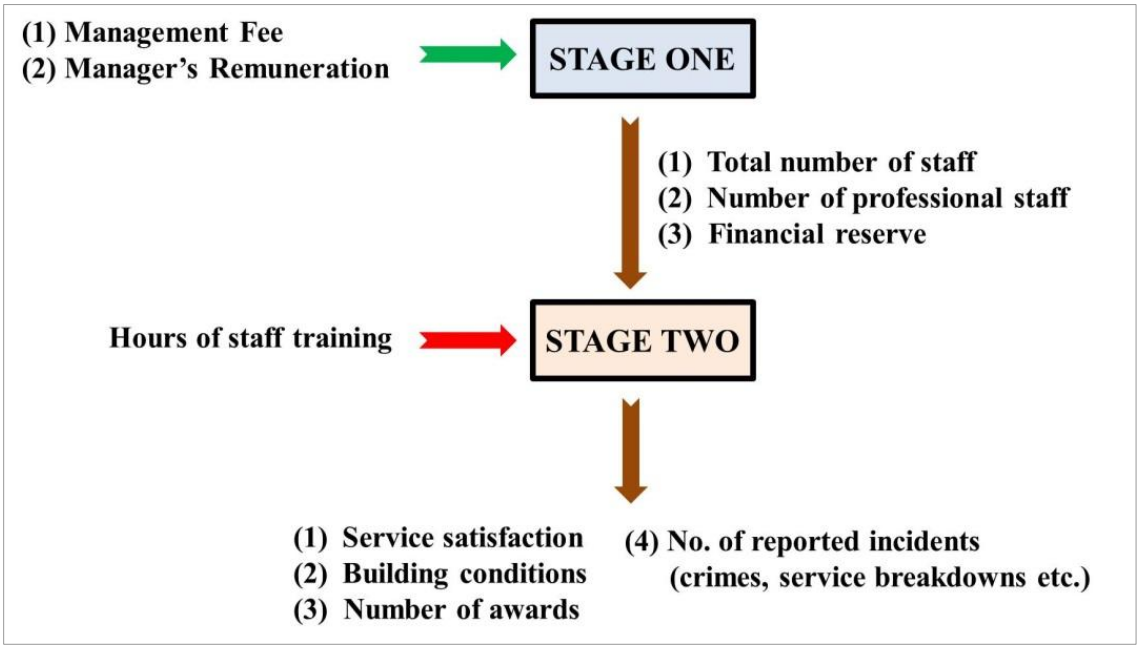

Figure 3. A two-stage "production" process of MOH management

As indicated in Figure 3, the model aims to measure the ability of each PMA to transform resources into capacity in the first stage. Management fee and manager's remuneration are employed to generate three output variables, namely financial reserve, total number of staff and number of professional staff employed

for managing a particular MOH development. The three output measures indicate the PMA's capacity to manage the MOH development. In the second stage, each PMA makes use of the management capacity to produce housing management outputs: service satisfaction, building conditions, number of awards and number of reported incidents. At the same time, staff training is also inputted in the second stage. The second stage aims to evaluate the PMA's service quality, i.e., what the PMA can achieve using the resource inputs given.

To evaluate a PMA's performance within two stages, we adopt the principle that intermediate products will affect the PMA's performance in the subsequent stage. For the series structure or two-stage model in Figure 3, it is supposed that n PMAs are evaluated. Take PMA_b as an example. In Stage One, PMA_b inputs X_b to produce t intermediate outputs I_b where $X_b = (x_{1b}, x_{2b},..., x_{mb})$ and $I_b = (i_{1b}, i_{2b},..., i_{mb})$. In Stage Two, PMA_b uses I_b, i.e. outputs from Stage One, to produce the final outputs Y_b. Under the assumption that the intermediate products remain unchanged in the process, the following models are developed:

Stage One

$\min \partial_{1o}$ such that $\sum_{b=1}^{n} \gamma_b X_{ab} \leq \partial_{1o} X_{ao}$ a = 1,2

$\sum_{b=1}^{n} \gamma_b I_{ab=} I_{to}$ t = 1,2,3 (1)

$\gamma_b \geq 0$ b = 1,2,...,n

Stage Two

$\max \partial_{2o}$ such that $\sum_{b=1}^{n} \gamma_b I_{tb} = I_{to}$ t = 1,2,3

$\sum_{b=1}^{n} \gamma_b X_{3b=} X_{3o}$

$\sum_{b=1}^{n} \gamma_b Y_{ro} \geq \partial_{2o} Y_{ro}$ r = 1,2,3,4 (2)

$\gamma_b \geq 0$ b = 1,2,...,n

Models 1 and 2 are input-oriented and output-oriented respectively. Both models are subject to the assumption of constant returns to scale. The optimal solution for Model 1, ∂'_{1o}, and that for Model 2, ∂'_{2o}, denote the highest levels of efficiency of Stage One and Stage Two respectively for PMA_o. Contrary to management fee and manager's remuneration, hours of staff training is a non-discretionary variable because staff training or staff development is a continuous exercise and its value is stationary in the short run. As mentioned above, this input reflects the PMA's capacity and may impact PMA's performance. Based on the above settings, the overall performance for PMA_o can be calculated with Model 3:

$\min \partial_o$ such that $\sum_{b=1}^{n} \gamma_b X'_{ab} \leq \partial_o X_{ao}$ a = 1,2,3

$\sum_{b=1}^{n} \gamma_b X_{3b=} X_{3o}$

$\sum_{b=1}^{n} \gamma_b Y'_{rb} \geq Y_{ro}$ r = 1,2,3,4 (3)

$\gamma_b \geq 0$ b = 1,2,...,n

where X'_{ab} and Y'_{rb} are the projected inputs and outputs on the best-practice frontier. The relative performance of each PMA in the two individual stages and in the overall process of service production can be obtained by solving Models 1, 2 and 3.

4. Design of the empirical study

4.1. Measurement of factors

"Management fee" is defined as the average management fee per saleable floor area collectable in a particular MOH development. Loosely speaking, "manager's remuneration" is the profit margin assumed by the PMA. It is expressed as a percentage of the total expenses, costs and charges necessarily and reasonably incurred in the management of the development. As for the outputs in the first second, "total number of staff" denotes the total number of resident staff per total gross floor area. All staff, including housing managers, cleaners, security guards and maintenance personnel, serving the MOH development specifically is counted. Similarly, "number of professional staff" is taken as the number of resident staff with professional qualifications (e.g. professional memberships of the Hong Kong Institute of Housing, Hong Kong Institute of Surveyors and Hong Kong Institute of Engineers etc.) per total gross floor area of the development. "Financial reserve" is measured as the amount of financial reserve in the management account per total gross floor area of the development in the end of previous financial year. "Hours of staff training" is measured as the total hours of training received by each resident staff for housing management on average in the previous year. The training can be provided by the PMA's head office or other external organizations.

Regarding the outputs of the second stage, "service satisfaction" is taken as the overall level of satisfaction of the residents in a MOH development with the service provided by the PMA. Each resident rates a PMA's performance with regard to various aspects including security, cleaning, communication, management of communal facilities and common areas with a five-point scale (5=very satisfied while 1=very dissatisfied). The overall level of resident satisfaction is obtained by taking a simple arithmetic mean of all surveyed residents' ratings. For each MOH development, "building conditions" are evaluated using a 100-point scale (100=best condition; 0=worst condition). The evaluation is carried out based on the Building Condition Index (BCI) developed by Yau (2008). The BCI is a protocol specifically designed for assessing building condition of private multi-storey residential buildings in Hong Kong. As shown in Figure 4, it covers various condition aspects including environmental hygiene, structural integrity, fire safety and presence of unauthorised appendages. Each of the evaluation factors of a MOH development can be rated according to the pre-determined rating scales. "Number of awards" is the number of external awards won by the MOH development in the previous year. These awards include Best Landscape Award and Quality Building Management Competition. Last but the least, "number of reported incidents" is measured as the reciprocal of the total number of building-related incidents (e.g. crimes, service breakdowns and vandalism) reported to the PMA or owner association in the previous year.

4.2. Data collection

Primary and secondary data were collected in Sham Shui Po and Tsuen Wan, Hong Kong in 2016 and 2017. A total of 370 private MOH developments were randomly selected. An invitation letter was sent to the PMA or resident association of each of these selected developments to participate in the research. Eventually, PMAs or resident associations of 46 housing developments agreed to partake in the research. The data collection process is graphically depicted in Figure 5. Basic information of the developments were obtained in a desk study in which record building plans and property management service agreements or contracts were studied. This aimed to collect development-based information such as management fee level, manager's remuneration and gross floor area. Then, site visits were conducted for assessing the actual building conditions of the developments. Moreover, the PMAs were invited to complete a questionnaire about the manpower deployed for managing the respective housing developments, external awards won, number of building-related incidents reported and hours of training taken by the resident staff. In the end, complete development-based data were available for 37 housing developments. Afterwards, 5% of the residential units in each of these 37 housing developments were randomly sampled. The household heads of these units were invited to complete a questionnaire on resident satisfaction with the PMA's service. 196 complete replies were received, representing a response rate of 21.4%. Tables 1 and 2 summarize the characteristics of the 37 MOH developments included in the final analysis and respondents of the resident satisfaction survey respectively.

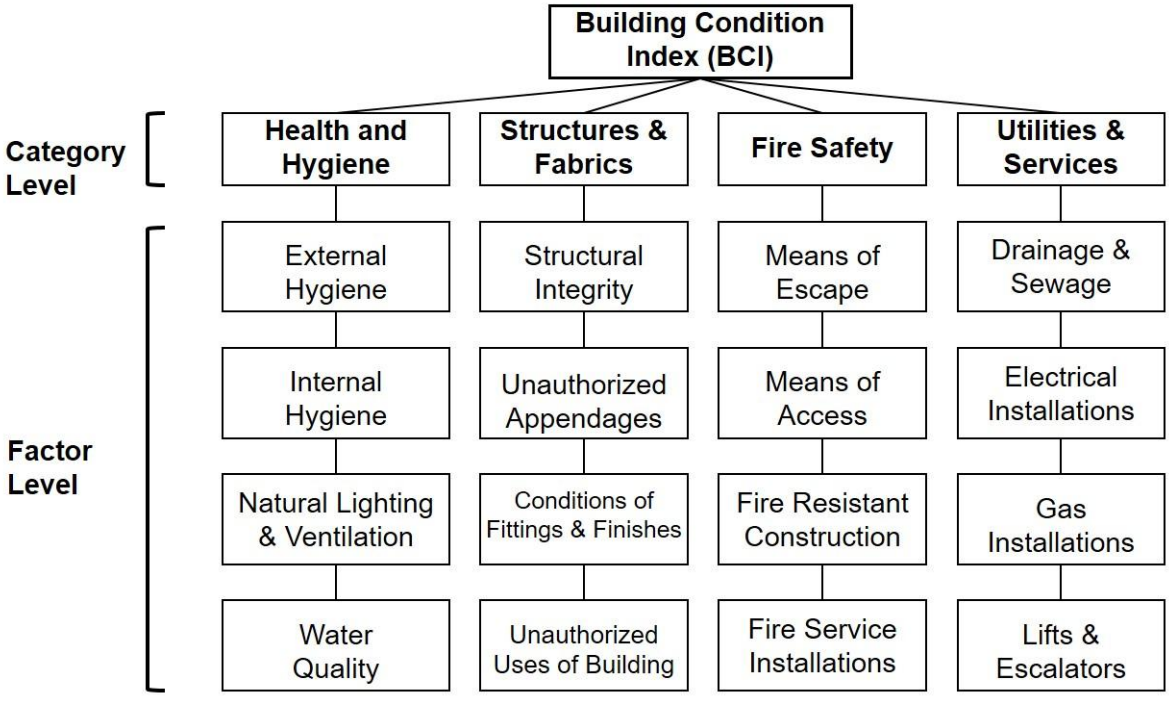

Figure 4. Factors assessed under the BCI framework (adapted from Yau, 2008: 323)

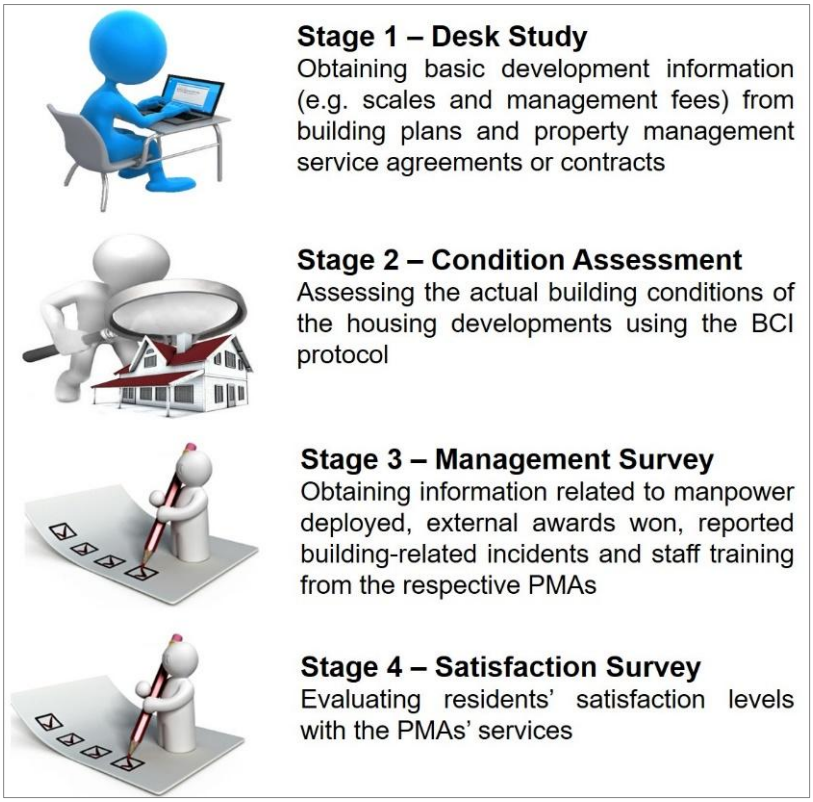

Figure 5. Processes of data collection

Table 1. Characteristics of the 37 MOH developments included in the final analysis

Characteristic	Maximum	Mean	Minimum	σ
Age (in years)	39	22.865	3	11.290
Number of blocks	14	6.595	1	5.318
Total number of flats	2,975	494.919	144	760.009

5. Findings and discussion

5.1. Analysis results

Table 3 tabulates the performance indices for the 37 PMAs in different stages. The first stage is the capacity building phase which determines a PMA's capacity to achieve desirable outputs in the subsequent stage, i.e. the service delivery phase. As the results show, 23 PMAs out of 37 were efficient in Stage One and 27 PMAs were efficient in Stage Two. Only eight PMAs were efficient in the overall process. All 37 PMAs had relatively high performance indices (i.e. 0.600 or above) in Stage One, indicating that PMAs were skilled in utilizing various resources to prepare their management capacity. As for the second stage, two PMAs had relatively low performance indices (i.e. below 0.600). PMA 18 and PMA 34 performed poorly in the service delivery even though they did quite well in capacity building. PMA 18 was the worst performer among the 37 PMAs.

Table 2. Characteristics of the 196 respondents of the resident satisfaction survey

Characteristic	Count	Percentage*
Gender		
Male	139	70.92%
Female	57	29.08%
Age		
18-24 years old	3	1.53%
25-34 years old	17	8.67%
35-44 years old	56	28.57%
45-54 years old	68	34.69%
55-64 years old	38	19.39%
65 years old or above	14	7.14%
Education level		
Primary school or below	8	4.08%
Lower secondary school	13	6.63%
Upper secondary school or matriculation	46	23.47%
Sub-degree post-secondary education	64	32.65%
Bachelor degree or above	65	33.16%
Average monthly personal income		
HK$9,999 or below	13	6.63%
HK$10,000 – 19,999	39	19.90%
HK$20,000 – 29,999	66	33.67%
HK$30,000 – 39,999	50	25.51%
HK$40,000 – 49,999	18	9.18%
HK$50,000 or above	10	5.10%

*Note: * The percentages of the categories for each characteristic may not sum up to 100% because of rounding.*

Interestingly, 21 PMAs were efficient in both stages but only eight were overall efficient. It was probably because of the inclusion of "hours of staff training" as a non-discretionary intermediate input in Stage Two. In the current two-stage model, we did not require that a PMA would be efficient if and only if both its capacity building and service delivery processes were both efficient. Unlike those intermediate outputs (e.g. "total number of staff" and "number of professional staff"), "hours of staff training" came from outside of the system and bore no relation to Stage One. In other words, it served as an external input in Stage Two. With this external input incorporated in the model, the quantity of inputs deployed in Stage Two deviates from that of outputs in Stage One.

5.2. Discussion and implications of the research findings

The research findings imply that staff training or development played an important role in determining the performance of PMA. Even when a PMA was good at building capacity for property management, its service delivery might be not satisfactory if its staff were not well-trained. This is true in the management of MOH developments in Hong Kong. As aforementioned, professional knowledge and specialized skills are required for managing MOH developments.

Table 3. Performance indices of the 37 PMAs

PMA	Performance Indices		
	Stage One	Stage Two	Overall
1	1	1	0.672
2	0.776	0.817	0.812
3	1	1	0.624
4	1	1	1
5	0.624	1	0.586
6	1	0.868	0.943
7	0.635	1	0.642
8	1	1	1
9	1	1	0.842
10	1	1	0.521
11	1	0.774	0.714
12	0.862	1	0.857
13	1	1	0.634
14	1	1	0.523
15	1	1	0.788
16	1	1	0.652
17	0.890	0.811	0.799
18	0.818	0.591	0.385
19	0.639	0.815	0.489
20	1	1	1
21	1	1	0.763
22	1	1	1
23	0.819	0.933	0.816
24	0.845	0.796	0.672
25	1	1	1
26	1	1	1
27	1	1	0.692
28	1	1	0.783
29	1	1	0.972
30	0.618	0.682	0.583
31	1	1	1
32	1	1	0.625
33	1	1	1
34	0.942	0.587	0.768
35	0.726	1	0.735
36	0.967	1	0.870
37	0.692	1	0.555

With the advancement in building technology and changes in legal requirements, both professional and non-professional personnel are required to keep their knowledge and skills up to date so as to maintain and improve meet their property management practices (Labour Department, 2000). However, professional training and staff development has not received due attention in Hong Kong's property management industry. Only sizeable property management companies offer regular in-house training to their employees. Many

other practitioners have to rely on the continuous professional development activities or events organized by the professional bodies such as the Chartered Institute of Housing, Hong Kong Institute of Housing and Hong Kong Institute of Surveyors.

Based on the results, property management companies should offer more training or staff development courses to their employees in order to advance the service quality and management performance and distinguish themselves from their competitors. As a matter of fact, property management practitioners need to handle many human-related issues such as conflict resolution and complaint management in their routine practices. To facilitate the work of the practitioners, a well-established mechanism of knowledge transfer is necessary. Experience exchange between colleagues will definitely help less-experienced colleagues enrich their know-how in handling different cases more effectively. Therefore, property management companies should organize regular "experience-sharing meetings" for employees to exchange tips, experience and knowledge in property management. Moreover, property management companies should also regularly review their staff training and development programmes. Through conducting "staff training questionnaire survey", they can identify what types of training are demanded by their employees so they can organize those courses.

The current research is an original attempt to devise a theoretically sound and practically feasible protocol to benchmark the performance of PMAs in the MOH management. It contributes to the development of a better understanding of staff training as an important factor determining PMA's performance in Hong Kong. The focus of the current research is placed on the PMAs in Hong Kong but the research findings have valuable implications for other high-rise Asian cities, such as Macau, Shanghai, Taipei and Singapore, where MOH predominates the housing sector. Given that there is no big difference between Hong Kong and these cities in terms of property management practice, the evaluation and benchmarking protocol developed in the current research can be applied to these Asian cities with minor adaptions. Besides, the findings of the current study can shed light in the performance improvement for the PMAs in these Asian cities.

5.3. Limitations of the research

Nonetheless, several limitations of the research should be noted. First, only PMAs managing private MOH in Hong Kong were investigated in the current study. Whether similar findings can be obtained from the study on PMAs managing public rental housing estates is unknown. Second, the number of observations (i.e., number of PMAs studied) in the current study was small compared with the total number of private MOH developments in Sham Shui Po and Tsuen Wan. The small sample could be ascribed to the fact that many owners associations and property management agents in Hong Kong treat building management data, particularly those related to financial reserve, manager's remuneration and service breakdowns, as sensitive data. These parties are reluctant to release these data simply because they do want to ruin the goodwill or reputation of their estates or companies. Third, only two districts in Hong Kong were selected for the empirical inquiry. In order to boost the generalizability of the findings, future research should be rolled out to cover other parts of Hong Kong, and other cities if possible.

6. Conclusion and agenda for further research

It is our common belief that professional property management is important in helping homeowners and residents create a pleasant, safe and healthy living environment. To a certain extent, professional property management can also contribute to sustainable development of a city as a whole through delaying the need of redevelopment, preserving property value and promoting an eco-friendly life style among residents. Paradoxically, homeowners and PMAs are often in principal-agent conflicts because their interests are not aligned. Therefore, poor management performance resulted from the agency problems associated with PMA is common. For better service provided by PMAs or professionalization of property management, evaluation and benchmarking of the performance of PMAs are crucial. Nonetheless, the existing performance indicators or measures are deficient. Consequently, an alternative approach for evaluating and benchmarking PMA performance in MOH management in Hong Kong was proposed in this article. The proposed approach applied the DEA method to the arena of property management. Taking the local context of property management into account, we developed a two-stage DEA model which used a number of input and output items to generate the overall performance index for each PMA on a development basis. Through the empirical study of 37 MOH developments in Hong Kong, the performance indices of their PMAs were computed and compared.

The DEA-based benchmarking approach illustrated in the article can have applications which are beneficial to all stakeholders in the field of property management when a critical mass of PMAs is benchmarked. For example, it can help the general public, particularly homeowners and residents, benchmark the performance of their PMAs with others. Homeowners or owners' corporations can make reference to the indices when procuring management services for their MOH developments. For the PMAs, the indices can offer them valuable information for continuous monitoring and improvement of their professional services. In the medium or long run, the benchmarking protocol can cultivate a culture of good-quality property management in Hong Kong as poorly-performing PMAs will be extinguished by market forces.

Nevertheless, the current study is a preliminary one which intends to stimulate more similar research in the future. The two-stage DEA model in Figure 1 has yet been validated. Future study can validate the performance indices generated using the model using property transaction prices or rents. It is expected that properties managed by a better-performing PMA should command a higher value or rent, *ceteris paribus*. Moreover, further research is warranted to explore the determinants of the performance indices. For example, does the organizational setting of MOH governance affect a PMA's performance? Does the existence of an owners association (e.g. owners' corporation) make a difference in a PMA's performance? ISO certification has a positive effect on the management performance of a PMA, as asserted by Chin and Poh (1999), but the relationship has yet been proven. In addition, it is interesting to see if there is any scale effect such that the performance of a PMA managing a larger housing development is better. Besides, whether a PMA's experience (in terms of length of service in the same housing development) affects its performance can be studied in the future.

Acknowledgement

The work described in this article was jointly supported by the grants from the Research Grants Council of the Hong Kong Special Administrative Region, China [Project Nos. CityU 11410214 and CityU 17201215]. The final form of this article owes much to the discussion at the International Sociological Association R43 Conference held in Hong Kong, China, 18-21 June 2017.

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