Property and Facility Management Division
The Hong Kong Institute of Surveyors

Benchmarking of Management Fees for Residential Properties in Hong Kong

Research Project 2007-08

香港城市大學
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Preface

In view of the diversity of property / facility management companies in Hong Kong, a wide range of management fees are being charged for different types of residential properties, making it difficult to identify and set a fair price that the general public can make reference to or rely on. In consequence, the Property and Facility Management Division of the Hong Kong Institute of Surveyors has entrusted the City University of Hong Kong with conducting a study on the benchmarking of management and maintenance fees for residential housing in Hong Kong.

The prime objectives of this research are (1) to investigate related factors that influence management and maintenance fees by statistically analysing the findings from different types of key housing estates, and (2) to establish a model for benchmarking that may be useful to practitioners. We are grateful that Dr. Mei-yung LEUNG of the City University of Hong Kong has kindly taken up this difficult task with support from the members of the Divisional Council, Mr. Charles HUNG and Mr. Gary YEUNG, who have devoted their own valuable time and efforts to make it a success. We are also thankful for the generous support from management companies, developers and owners who have provided sensitive information that was crucial for carrying out the detailed analysis of the research project at the end.

We realise that the study is by no means exhaustive and requires further detailed analysis of the intricate relationships between the different factors influencing the management and maintenance fees of residential properties. Any suggestions or improvements on the existing research project would be greatly welcome. All feedback will be collected and incorporated into future editions.

Kenneth CHAN Jor Kin

Chairman
Property and Facility Management Division
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March 2009

EXECUTIVE SUMMARY

1. Hong Kong is a metropolitan city with a population of 6,994,000 and 2,486,000 residential flats in 2006. As each property involves different variables such as the electrical supply system, landscaping, security, and the like, it is very difficult to identify and agree upon fair property/facility (PF) maintenance and management fees for different residential properties. This project aims to identify benchmarks for maintenance and management fees for residential buildings in HK in order to rationalise the practice. To achieve the desired project aim, the following major objectives are to be fulfilled:
   (1) to identify major variables (PF components and estate backgrounds) influencing the maintenance and management fees for residential buildings;
   (2) to determine the variation ranges of maintenance and management fees per GFA with respect to estate background information; and
   (3) to determine the variation ranges of expenses on the major PF components per GFA with respect to estate background information.

2. This study identified 20 top **PF components** affecting maintenance and management expenses; the major six PF components covering 88% of total expenses consist of:
   (1) the total sum of salary; (2) electricity supply costs;
   (3) security expenses; (4) electrical system repair and replacement;
   (5) cleaning expenses; and (6) lift maintenance costs.

   To control and monitor maintenance and management expenses, it is suggested that property managers and owners concentrate mainly on these six PF components.

3. The results of correlation analysis revealed no significant relationship between the maintenance and management fee and the building age/manager remuneration. However, the total maintenance and management **fee** was significantly and positively related to the *size of the estate* (e.g., gross floor area (GFA), total common area, total number of floors, and number of dwelling units). The maintenance and management **fee per GFA** was correlated with the *quality of the estate/building* (e.g., individual unit size and second-hand selling price).

4. Since estate background is related to the maintenance and management fee and the expenses of various PF components, the background information for estates/buildings in HK is considered to be a reference point for setting management fees. The mean value of the maintenance and management fee per GFA is \$14.4 per m^2, ranging from \$8.6 (25^{th} percentile) to \$20.6 (75^{th} percentile), while the mean value of PF expenses per GFA is \$7.1 per m^2 with the range from \$3.5 to \$8.8. This study *recommends that the maintenance and management fee per square metre is set based on the range of estate backgrounds, including: GFA; total common area; total number of floors; number of dwelling units; individual unit size; and second-hand selling price*.

5. To develop a comprehensive benchmarking system for the maintenance and management fees of residential estates/buildings, it is strongly recommended that more data be collected and the data be further analysed with a combination of various estate/building backgrounds. The satisfaction of end users could also be considered in the overall study. The current study, however, has established a good platform for a large-scale survey in the next stage of setting an applicable benchmarking index in the industry.

Contents

1. INTRODUCTION

Hong Kong is a metropolitan city with a population of 6,994,000 (Census and Statistics, 2006; Hong Kong Housing Authority, 2006) and 2,486,000 residential flats in 2006. It also includes 9,407,800 square metres for commercial use, 9,794,900 square metres for offices and 17,480,000 square metres for industry. The Hong Kong Institute of Facility Management (2004) reported that management fees for all residential, commercial, office, and industrial buildings reach $43 billions per year (or 3.4% of GDP) in Hong Kong. Over half of the property/facility management market consists mainly of residential buildings and estates.

The housing market is an inherently dynamic, stochastic, multidimensional and interdependent entity. For instance, rising incomes increase the demand for higher quality accommodations and environmental amenities. When considering different housing characteristics, changes in the price structure of housing attributes must be recognised. To ascertain the quality of the market comparison approach in a formal appraisal, it is frequently necessary to assess the elements of comparison, including not only the motivation of buyers, but also the quality of housing facilities.

A number of property/facility management companies manage both public and private residential buildings in Hong Kong. To ensure performance quality, most have obtained different quality recognitions such as ISO9000, ISO 14001, and so forth. However, each property involves different variables such as the electrical supply system, landscaping, security, and the like. Thus, it is very difficult to identify and agree upon fair property maintenance and management fees for different residential properties. To identify a fair property management fee, it is essential to benchmark property maintenance and management fees for both residences and property management companies.

This project aims to identify benchmarks for maintenance and management fees for residential buildings in Hong Kong in order to rationalise the practice. To achieve the desired project aim, the following objectives are to be fulfilled:

1. to identify major variables (PF components and estate backgrounds) influencing the maintenance and management fees for residential buildings;
2. to determine the variation ranges of maintenance and management fees per gross floor area with respect to estate background information; and
3. to determine the variation ranges of expenses for the top PF components per gross floor area with respect to estate background information.

The expected outcomes of this project include a list of factors influencing maintenance and management fees for residential buildings. This will enable

property and facility managers to identify and adjust these fees in the market. Property and facility companies can then maximise their performance by examining the factors identified in the operational process.

2. PROPERTY/FACILITY MANAGEMENT

A property/facility management company must prepare a monthly income–expense account (IE), which includes all income (e.g. management fees and bank interest) and expenses (salary, water supply costs and electricity costs).

Different approaches, systems and structures are used for calculating maintenance and management fees, for instance, the lump sum cost (Downs, 1996), the percentage approach, cost references for similar building types (Kaiser, 1989 p.64), costing systems with an absorption or marginal costing approach (Alexander, 1996) and costing and pricing structure with fixed/variable costs and direct/indirect costs (Liu, 2004). However, there are no restrictions or guidance on the amount of management fees in Hong Kong owing to the huge variance and uncertainties of maintenance and management expenses for residential estates/buildings. In common practice, the maintenance and management fee per meter square depends on the estimated expenses of the estate, which rely merely on the past experience of property/facility managers or the historical data on the estate (Hong Kong Institute of Real Estate, 2007). Thus, because it is difficult to determine the maintenance and management fee for a new development in practice, a study to benchmark these fees for residential estates/buildings is essential for property/facility management in the industry.

3. PF MAINTENANCE AND MANAGEMENT COMPONENTS

Based on the extensive literature, property/facility (PF) maintenance and management components can be classified into eleven items (see Table 1).

Table 1 PF Components Stated in the Literature

Background/PF Components	Stoy (2007)	Varcoe (1992)	David (2005)	Stoy (2006)	ISO (2006)	Alexander (1993)	Wong (2001)	Mc Gregor (1999)	Scarrett (1995)	Kyle (2005)
Landscaping & decoration	*	*	*		*		*			
Cleaning									*	
Thermal comfort /indoor air qlty	*		*	*		*	*			
Electrical power and lighting	*		*	*		*	*	*	*	
Pumping and Drainage	*				*	*	*		*	*
Lift									*	
IT services			*	*			*	*		
Security, safety and privacy		*	*	*	*	*	*		*	
Entertainment facilities			*				*			
Building repairs	*	*	*	*	*	*	*			
Management		*	*		*					

3.1 Landscaping and Decoration

Because of Hong Kong's tiny area, most common areas of properties are relatively small. Property and facility managers need to decorate these common areas at different festivals to enhance the festive mood. Both *landscaping* and *decorations* for festivals should apply space management skills, involving concepts of both science and art, to a building structure. A good property and facility manager should thus understand both natural and construction elements and blend them together in the management process. Basically, estates need to purchase the raw materials, such as decoration materials or plants, and arrange for decoration and landscaping work by their own staff. Some large estates, however, may simply outsource these tasks to sub-contractors.

3.2 Cleaning

The cleanliness of common areas in buildings and their immediate neighbourhood reflects their environmental hygiene condition. An unhygienic environment not only creates nuisances to occupants, but also induces problems with pests and increases micro-organisms that can lead to the spread of infectious diseases. Nowadays, most management companies of residential properties outsource *cleaning* services to special cleaning companies. This can simplify the overall management process and stabilise the expenses of cleaning for a property.

3.3 Thermal Comfort / Indoor Air Quality

A static environment must be maintained to avoid any physical or attitudinal problems. An effective temperature also refers to an individual's perception of the ambient temperature and is strongly influenced by humidity (McAndrew, 1993). High humidity is negatively correlated with vigour and other positive moods. It has a negative effect not only on people's health and comfort but also on their efficiency (Pratt, 1994). Thus, both humidity and temperature influence people emotionally and physically and can subsequently affect their productivity.

Temperature affects people's thermal comfort. A cold temperature educes manual dexterity, tactile sensitivity and motivation levels and increases reaction times. (McAndrew, 1993). On the other hand, poor ventilation can cause headaches, drowsiness and the inability to concentrate (Deb, 2003). *Indoor air pollution* (IAP) is often difficult to differentiate from SBS symptoms. In many cases of IAP, the irritants are brought into the internal common areas of estates (e.g., lift lobbies, estate management office and club house). Inadequate ventilation rates and circulation rates prevent these irritants from being diluted or removed rapidly enough to avoid discomfort. To maintain comfortable thermal conditions and indoor air quality for the residents, costs are incurred for electricity and for repairing and replacing the relevant mechanical ventilation and air-conditioning systems.

3.4 Electrical Power and Lighting

Electricity has significantly improved our lifestyle, our comfort and our communication efficiency. In Hong Kong today, a safe and reliable electrical supply, installations and appliances continue to improve our quality of life and help maintain our city as a world class international metropolis. Although each estate has its own style of dealing with lighting and air conditioning, it achieves lighting and thermal comfort to improve the residents' lifestyle. Normally, lighting, air conditioning and lifts consume most of the electrical supply cost in residential estates. Residential property and facility managers generally need to estimate the cost for repairing the electrical system based only on the historical data in the estate.

3.5 Pumping and Drainage

Hong Kong enjoys one of the safest water supplies in the world. With proper treatment and stringent quality monitoring and control, our water quality complies both chemically and bacteriologically with the Guidelines for Drinking-water Quality recommended by the World Health Organisation. However, the government has given no instructions for maintaining the water supply systems. Residential property and facility managers need to allow for regular maintenance costs for the *pumping*

and drainage system based on historical data, and for ad hoc maintenance costs for repairing and replacing the system according to the professional comments of qualified pumping and drainage engineers.

3.6 Lift

Most residential buildings in Hong Kong are high-rise buildings. The Lifts and Escalators (Safety) Ordinance (Cap. 327) and subsidiary regulations govern safety for installing and operating lifts and escalators. Sections 21, 22, 23 and 24 of the Ordinance stipulate the requirements for periodically examining and testing lifts (Electrical and Mechanical Services Department, 2002). Therefore, lift examinations and tests are normally contracted out to professional lift companies in property management.

3.7 IT services

Apart from the basic types of building services, nowadays Hong Kong residential buildings most likely provide IT services in the clubhouse, the lift lobby, or, even, residential flat as an intelligent building for residents. IT services include telephone, computer, internet services and so forth.

3.8 Security, Safety, and Privacy

Erecting walls, fences, privacy screens and partitions in appropriate positions can prevent invasion of physical privacy. The actual expenses for privacy protection largely depend on the layout of the residential estates design, the number of security staff employed and the security system installed in the estate. The cost of providing full *security* service at each point of entry and exit to a facility is often overlooked during the early development stages. Many different types of security systems are available in Hong Kong such as password lobby doors and CCTV. Security guards also play a key role in residential buildings. The number of security guards is normally related to the size of the residential estate. Some management companies of residential properties employ outsourced security services from security companies. Although this simplifies the management process and stabilises the expenses of security, management companies should pay more attention to the quality of outsourced security guard services.

Fire *safety* is a major concern of most maintenance managers of residential buildings in Hong Kong, especially since many serious fires have occurred, for example, the Garley Building Fire, the Mei Fu Sun Tsun Fire and so forth. To maintain an existing building at an acceptable fire safety level, the fire safety facilities, which include building fabric (structural fire protection means) and building services (fire service

installations), should be maintained at good and efficient standards (Lo, 2000). The budget for the expenses of property and facility management and maintenance should cover not only maintenance of the fire safety system but also quality upgrades for achieving updated expectations for residences.

3.9 Entertainment Facilities

Although Hong Kong has been ranked the fifth worst in the world with respect to weekly working hours, Hong Kong people still have expectations for their entertainment facilities in their own estate. In fact, most Hong Kong residential properties provide entertainment facilities for residents. Outdoor sports facilities, playgrounds and outdoor swimming pools are the most common facilities. High-class residential properties further provide clubhouses that include a gym room, conference room, multipurpose room, game room, indoor swimming pool and so forth. Obviously, the operation costs of estates with a clubhouse and/or swimming pool are more expensive than those without, and so the management fee will normally increase.

3.10 Building Repairs

All buildings eventually develop defects when exposed to the degrading effects of nature. Normally, the maintenance costs of building elements increase according to building age. Defects arise generally from two main causes: natural deterioration and human errors. Proper maintenance and avoidance of human errors can be achieved using different strategies: custodial maintenance, corrective maintenance, preventive maintenance and emergency maintenance (Office of Government Commerce, 2007). To ensure operational building performance and minimise possible costs, the following building elements need to be inspected and maintained regularly (refer to LACO, 2006):

(1) structural elements;
(2) external wall finishes and roofing materials;
(3) the slope structures (if applicable);
(4) window installations; and
(5) finishes.

3.11 Management

The property/facilities management organisation has direct responsibility for the provision and operation of the buildings and property assets, procurement of the premises, capital plant and equipment, and ongoing premise maintenance (Alexander, 1993). The organisational structure varies depending on the facilities and support services provided for an estate. In general, it includes property managers and on-site

management staff. *Property/facilities managers* must be equipped with knowledge of the facilities and management to carry out their integrated support role (Champika and Charles, 2005). The main role of facility managers is to integrate the people of an organisation with its purpose (work) and place (facilities) in order to meet the needs of end users; to practice in manner that supports the rights of employers, employees and clients; and not to discriminate on the basis of race, sex, creed, age or national origin.

For most multi-tenanted buildings, minimum personnel requirements should be studied carefully to make sure that the full-time staff are sufficient to meet the routine maintenance chores of the building. Many knowledgeable managers provide service uniforms for *maintenance personnel* to enhance the prestige of the building and to strengthen employer-employee identification among the maintenance team (Kyle, 2005). At the same time, the manager also needs to point out that each employee represents the company in serving the residents of an estate and satisfying their requirements.

The *manager's remuneration* (MR) should be a percentage of the total expenses necessarily and reasonably incurred in the good and efficient management of the estate (Loo, 1991). Because each estate calculates the MR differently, it can be amended by agreement between the OC and the management company. According to the Legal Advisory and Conveyancing Office (LACO, 2006), the MR fee of a residential estate must not exceed the following percentages of total expenses.

For estates with 20 or fewer residential units and parking spaces:	20%
For estates with 21 to 100 residential units and parking spaces:	15%
For estates with 101 or more residential units and parking spaces:	10%

Exceptions are allowed with approval by a resolution of owners at an owners' meeting convened under the Deeds of Mutual Covenant (LACO, 2006).

Providing a special /sinking /capital fund is desirable for any prudent manager who is responsible for preparing the budget. The fund is prepared to replace major items of capital expenses, for instance, major external wall renovations and repainting, replacement of pumps, generators and lifts, and the like (HKIR, 2007; Loo, 1991).

4. MODEL DEVELOPMENT

A residential property is a multi-dimensional commodity, characterised by durability and structural inflexibility as well as spatial fixity. Each residential unit has a unique bundle of attributes: its accessibility to work and transport, amenities, structural characteristics, neighbourhood, and environmental quality (Ridker and Henning, 1967; Muth, 1969; Stegmen, 1969; Kain and Quigley, 1970; Evans, 1973; Lerman, 1979).

Maintenance and management fees in residential housing are supposed to be used effectively and efficiently. The management companies use their own strategies to allocate their limited resources for obtaining satisfactory services.

The maintenance and management fee (either the total fee or the fee per gross floor area) is normally decided based on the background of the estate (e.g. gross floor area (GFA), number of floors, number of dwelling units, etc.) and the actual expenses of the PF components, whereas the actual expenses of PF maintenance and management may be changed according to the estate background. For example, electricity charges in an estate/building may be higher because of a large GFA, while the entertainment facility maintenance costs may be higher owing to a luxury apartment (large area for an individual unit), and so on. Figure 1 illustrates the relationship between the maintenance and management fee, the background of the estate and the expenses of PF components as a hypothetical model of property/facility maintenance and management fee–background–expenses.

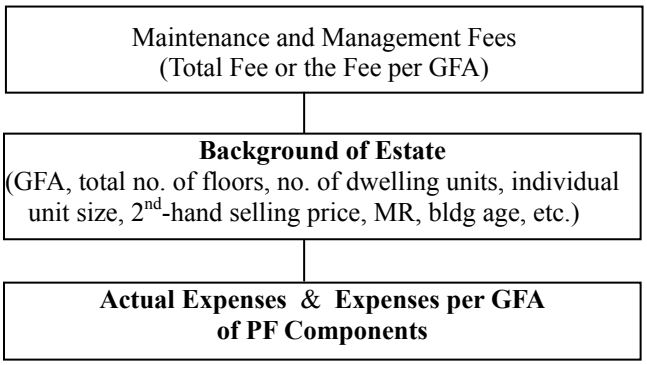


Figure 1 A Hypothetical Fee–Background–Expenses Model for PF Maintenance and Management

The model consists of three stages: input (PF maintenance and management fees), process (estate background) and output (expenses for PF maintenance and management). The PF management needs to receive the fee for the maintenance and management of an estate/building.

5. RESEARCH METHOD

Each estate has its particular characteristics, such as varying numbers of blocks and units, facilities in a club house/common areas, management organisation, social status of residents and so forth. Therefore, a questionnaire (see Appendix I) was designed covering three main areas: (1) an estate's background information; (2) property expenses; and (3) management organisation. An invitation letter was sent to 80 residential management companies in Hong Kong.

The data collected were then analysed by computer software SPSS 14.0 for Windows, and Pearson correlation analysis and exploratory analysis were applied. The correlation analysis parametric test was used to investigate the strength of the relationship between two sets of ratings. Coefficients were in a range from -1 to +1, where -1 represents a perfectly negative relationship, +1 means a perfectly positive relationship, and zero means no relationship at all. (refer to Section 6.3) P-value is the probability that the correlation coefficient is in fact zero (null hypothesis). If this probability (i.e. p-value) is lower than the conventional 5% ($p < 0.05$), the correlation coefficient is called statistically significant. In this study, items with the p-value lower than 0.01 will be discussed mainly.

Exploratory data analysis was used to investigate the variation ranges of maintenance and management fees per GFA and the variation ranges of PF expenses per GFA with regard to an estate's background information. A percentile is the value of a variable below which a certain percent of observations fall. The 25th percentile is also known as the first quartile, and the 50th percentile as the median. Exploring the data structures would help produce benchmarks for decision making in different categories of estates in terms their background information.

6. RESULTS

6.1 Background Information

Forty-one sets of data on residential estates were collected from 10 companies in this study between October 2007 and February 2008. Each data set was filled in by one or two estate management company staff members.

There were 28 (82.4%) estates from private residential housing and 6 (17.6%) estates from the Private Sector Participation Scheme or Home Ownership Scheme (see Table 2). The estates were located in different regions of Hong Kong, including Causeway Bay, Kowloon Bay, Tsueng Kwan O, Sha Tin, Tuen Mun and others. Nineteen estates/buildings were from Hong Kong Island (50%), 10 from Kowloon (26.3%) and 9 from New Territories (23.7%).

Table 2 Background Information of Responding Estates

Background		Number of Estates	Percentage	Cumulative Percent
Type	PSPS/HOS	6	17.6	17.6
	Private residential housing	28	82.4	100
			100	
Location	Hong Kong Island	19	50.0	50.0
	Kowloon	10	26.3	76.3
	New Territories	9	23.7	100.0
			100	

Maintenance and management fee per gross floor area	< $7 /m^2	9	23.7	23.7
	$8-9 /m^2	5	13.2	36.8
	$9-10 /m^2	3	7.9	44.7
	$10-11 /m^2	1	2.6	47.4
	$11-12 /m^2	4	10.5	57.9
	$12-13 /m^2	5	13.2	71.1
	≥ $13 /m^2	11	28.9	100.0
			100	
Gross floor area	< 10k m^2	15	39.5	39.5
	10k-50k m^2	9	23.7	63.2
	50k-100k m^2	6	15.8	78.9
	≥ 100k m^2	8	21.1	100.0
			100	
Total common area	< 10 km^2	13	54.2	54.2
	10-20 km^2	4	16.7	70.8
	≥ 20 km^2	7	29.2	100.0
			100	
Building age	0-10 years	14	35.0	35.0
	10-20 years	14	35.0	70.0
	20-30 years	8	20.0	90.0
	30-40 years	2	5.0	95.0
	40-50 years	2	5.0	100.0
			100	
No. of blocks	1	17	43.6	43.6
	2-5	12	30.8	74.4
	6-10	5	12.8	87.2
	≥ 10	5	12.8	100.0
			100	
Total no. of floors	1-20	8	20.5	20.5
	21-40	13	33.3	53.8
	≥ 41	18	46.2	100.0
			100	
No. of dwelling units	< 1000	29	74.4	74.4
	≥ 1000	10	25.6	100.0
			100	
Individual unit size	< 50 m^2	5	16.7	16.7
	50-100 m^2	16	53.3	70.0
	≥ 100 m^2	9	30	100.0
			100	
Entertainment facilities	Sports facilities (outdoor)	11	26.8	-
	Swimming pool (outdoor)	18	43.9	
	Playground	20	48.8	
	Pool	5	12.2	
	Gym room	13	31.7	
	Clubhouse	10	24.4	
Manager remuneration	< 5%	21	60.0	60.0
	5-10%	12	34.3	94.3
	10-15	1	2.9	97.1
	≥ 15%	1	2.9	100.0
			100	
2nd-hand selling price	< $25000 /m^2	7	22.6	22.6
	$25000-$45000 /m^2	5	16.1	38.7
	$45000-$65000 /m^2	9	29.0	67.7
	≥ $65000 /m^2	10	32.3	100.0
			100	

Note: - Background items in bold are used for data analysis in Section 6.3.
- PSPS/HOS - Private Sector Participation Scheme or Home Ownership Scheme
- Due to the incompleteness of the returned survey questionnaires, the total number of estates for each estate background may be less than the total number of respondents in the study (i.e. 41).

As Table 2 shows, the GFA of the estates varies from 1,000 to 1,000,000 square metres, the total common area varies from less than 10 square kilometres to more than 100, while the maintenance and management fees per gross floor area and the age of the estates /buildings vary from $7 to $34 and from 1 to 44 years, respectively.

Seventeen (43.6%), 12 (30.8%), 5 (12.8%) and 5 (12.8%) estates have one block, 2-5 blocks, 6-10 blocks and over 10 blocks, respectively. The total number of floors in each estate varies from 8 to over 1000. Most of the estates/buildings include fewer than 1000 dwelling units (77%), while 9 estates (23.1%) have 1,000 or more. Most buildings consist of individual unit sizes between 50 and 100 square metres; only 5 buildings are less than 50 square metres, and 9 are above 100.

The estates provide different facilities: 11 (26.8%) have outdoor sports facilities; 18 (43.9%) have an outdoor swimming pool; 20 (48.8%) have a playground; 5 (12.2%) have a pool; 13 (31.7%) have a separate gym room; and 10 (24.4%) have a clubhouse. Most estates have an MR below 10%, although the MR for two estates is above 10%. These two estates either have fewer than 101 residential units and parking spaces or obtained approval at an owners' meeting convened under the DMC. A management company for a residential estate normally includes a manager, technician, officer, cleaner, and security guard. As most of the cleaner and security guard jobs are outsourced nowadays, the study does not consider cleaners and security guards as part of the management team.

Seven estates claim a second-hand selling price of less than $25,000 per square metre, while 5, 9 and 10 estates are between $25,000 and $45,000, between $45,000 and $65,000, and higher than $65,000, respectively.

6.2 PF Components

The percentage of total expenses for each factor (refer to Eq.1) was applied to ranking the PF components on the maintenance and management fees for residential buildings. Table 3 lists the top 20 PF components (out of 25) that influence the maintenance and management fees of residential buildings in Hong Kong.

$$\%\ \text{of total expenditure} = \frac{\text{total expenditure of factor}}{\text{total expenditure}} \times 100\% \qquad \text{Eq. 1}$$

Table 3 Percentage of Total Expenses of Top 20 PF Components

PF Components	% of Total Expenses	Cumulative %
1. Total sum of direct salary	**22.61**	**22.61**
2. Electricity supply costs	**19.64**	**42.25**
3. Security expenses	**15.38**	**57.63**
4. Electrical system repair and replacement	**11.19**	**68.82**
5. Cleaning expenses	**11.01**	**79.83**
6. Lift maintenance costs	**8.48**	**88.31**
7. Clubhouse expenses	2.48	90.79
8. Swimming pool (outdoor) expenses	2.02	92.81
9. Building repair	1.98	94.79
10. Landscaping expenses	1.24	96.03
11. Pumping and drainage system repair and replacement	1.12	97.15
12. Security system maintenance costs	1.11	98.26
13. Stationary costs	0.45	98.71
14. Fire service maintenance	0.33	99.04
15. Management office expenses	0.30	99.34
16. Decoration expenses	0.25	99.59
17. Water supply costs	0.19	99.78
18. Playground expenses	0.12	99.90
19. Gym room expenses	0.06	99.96
20. Sports facilities (outdoor) expenses	0.04	100
Total	**100**	

The cumulative percentage indicates that the top six components (i.e. the total sum of salary, electricity supply costs, security expenses, electrical system repair and replacement, cleaning expenses and lift maintenance costs) make up 88.31 % of total expenses (also see Figure 2).

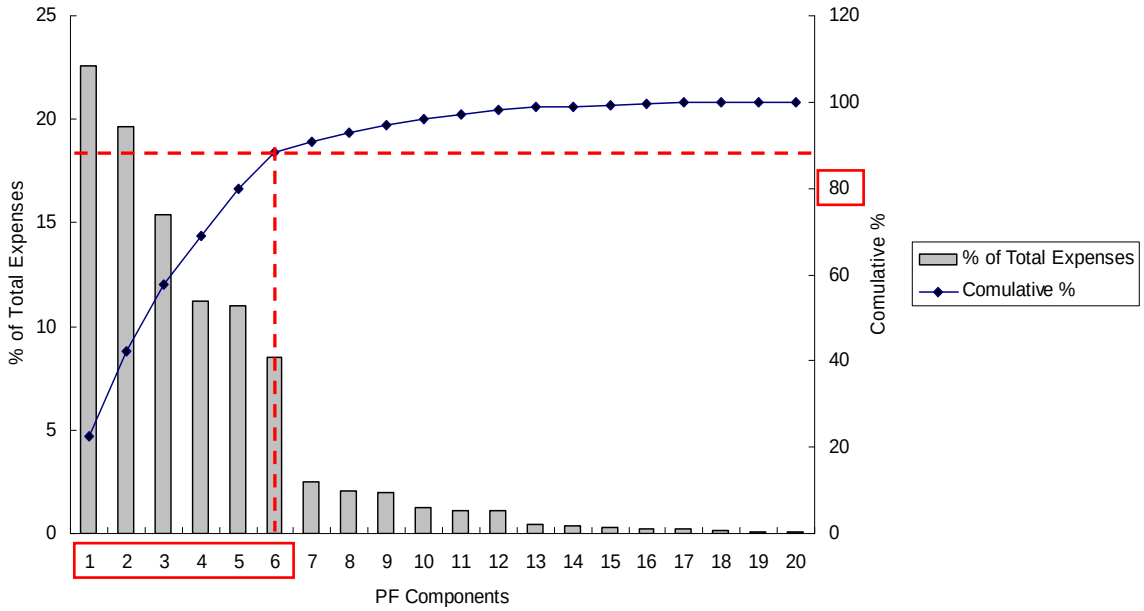


Figure 2 Percentage of Total Expenses for the Top 20 PF Components.
[Note: Information of PF Components refers to Table 3.]

6.3 Correlations between Estate Backgrounds and Maintenance and Management Fees

Because an estate's background is well-known information at the beginning of property/facility management, the relationship between background (refer to Section 6.1), the expenses of PF components (refer to Section 6.2) and maintenance and management fees can give property managers a basis for determining the management fee of a residential estate.

The relationships between an estate's backgrounds (refer to Table 2) and the maintenance and management fees were investigated using the Pearson product-moment correlation coefficient. The correlation coefficients presented in Table 4 indicate the strengths of linear relationships between the two variables. The results show significant correlations between total maintenance and management fees and GFA ($r=0.531$, $p<0.01$), total common area ($r=0.859$, $p<0.001$), total number of floors ($r=0.521$, $p<0.01$) and number of dwelling units ($r=0.523$, $p<0.01$). On the other hand, there was a significant relationship only between maintenance and management fees per square metre and the unit size of a flat ($r=0.524$, $p<0.01$) and between maintenance and management fees per metre square and the second-hand selling price ($r=0.449$, $p<0.05$). This represents a certain positive linkage between the maintenance and management fee per square metre and individual unit size, as well as the second-hand selling price.

Table 4 Correlations between Estate Backgrounds and Maintenance and Management Fees

Residential estates background	Sample size	Total maintenance and management fees	Sample size	Total maintenance and management fees/m^2
Gross floor area	37	**.531****	38	-.147
Total common area	24	**.859*****	24	-.060
Building age	39	-.054	38	-.163
Number of blocks	38	.168	38	.112
Total number of floors	38	**.521****	38	-.047
Number of dwelling units	38	**.523****	37	-.136
Individual unit size	30	-.067	29	**.524****
MR and administration fee	37	-.264	35	-.202
Second-hand selling price	30	.063	30	**.449***

Note: * Correlation is significant at the 0.05 level (2-tailed);
** Correlation is significant at the 0.01 level (2-tailed);
*** Correlation is significant at the 0.001 level (2-tailed).

Figure 3 below shows a set of data with a correlation coefficient of 0.531, representing the strength of the linear relationship between total maintenance and management fees and gross floor area (refer to Table 4).

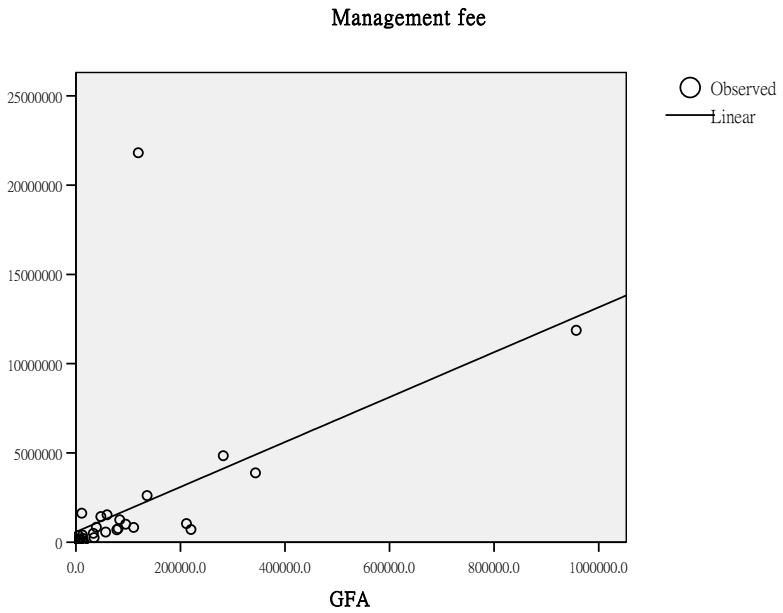


Figure 3 Correlation between Total Maintenance and Management Fees and Gross Floor Area (r=0.531 at the significant level of 0.01)

6.4 Descriptive Analysis

6.4.1 Benchmarks of Maintenance and Management Fee per GFA

Since all estates/buildings are unique with respect to their particular background and facility components, the study further calculated variations in the maintenance and management fee per square metre with respect to different background groups. The results in Section 6.3 show significant relationships between estate background (GFA, total common area, total number of floors, number of dwelling units) and the maintenance and management fee, and between estate background (individual unit size and second-hand selling price) and the maintenance and management fee per gross floor area. The GFA, the total common area, the total number of floors and number of dwelling units can reflect the *size of the estate*, while the individual unit size and the second-hand selling price represent the *quality of estates*. Descriptive analysis of the maintenance and management fee per gross floor area was conducted based on the varying backgrounds of residential estates identified.

Table 7 Variations in Maintenance and Management Fee per GFA with Respect to Different Estate Backgrounds

Estate Background		N	Mean	Min.	25th percentile	Median	75th percentile	Max.
General		41	**14.4**	.16	8.6	14.8	20.6	34.4
Gross floor area	**< 10,000**	15	**18.4**	.16	***16.7***	20.4	24.8	34.4
	≥ 10,000	23	11.8	.19	7.5	11.3	***15.2***	30.1
Total common area	**< 10,000**	13	**21.0**	7.00	***16.1***	20.4	27.5	34.0
	≥ 10,000	11	13.1	8.00	9.4	10.6	***17.2***	26.0
Total number of floors	**< 30**	17	**19.0**	.19	***14.5***	18.3	24.8	34.4
	≥ 30	21	10.6	.16	4.5	10.6	***15.1***	25.8
Number of dwelling units	**< 1,000**	29	**15.8**	.16	7.3	17.2	21.5	34.4
	≥ 1,000	10	12.0	7.50	9.2	11.9	14.8	17.2
Individual unit size	< 100	21	15.0	7.30	10.3	14.6	***18.3***	32.25
	≥ 100	9	**22.6**	10.00	***16.3***	22.6	29.0	34.4
2nd-hand selling price	< 45,000	12	10.2	.17	7.4	9.7	***12.3***	25.8
	≥ 45,000	19	**17.9**	.20	***12.4***	18.3	22.3	34.4
For reference only:								
Building age	**< 10**	14	**16.9**	.20	15.1	17.8	21.0	25.8
	≥ 10	26	12.9	.16	3.0	11.0	19.5	34.0
Number of blocks	**< 2**	17	**16.3**	.17	8.6	18.3	21.0	32.3
	≥ 2	22	13.0	.16	8.9	11.9	17.2	34.4

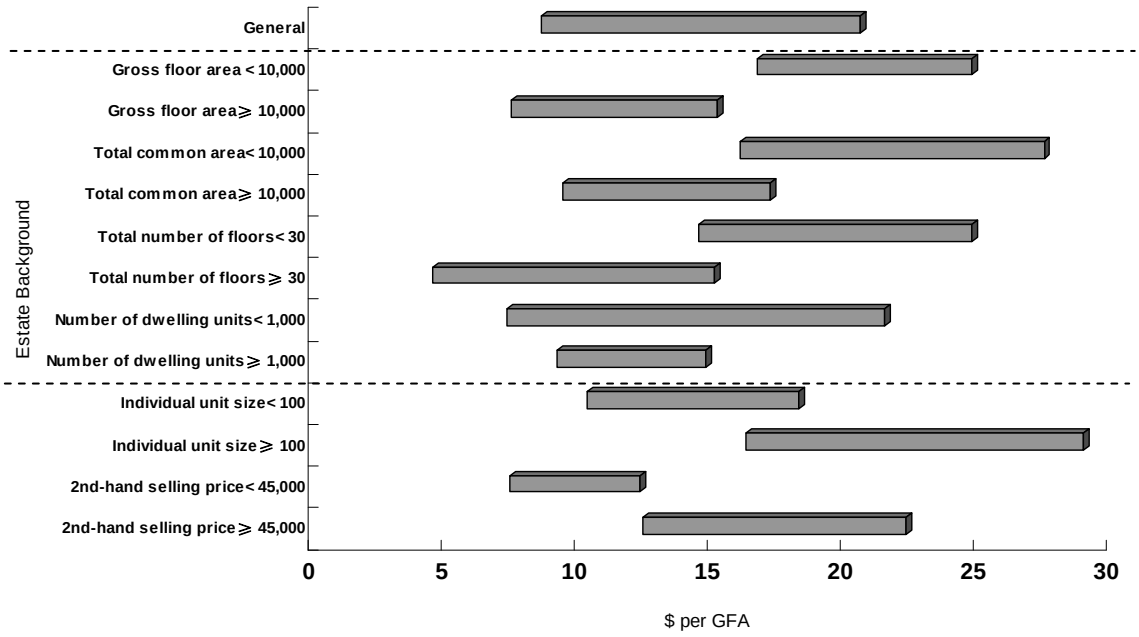


Figure 4 Variations in Maintenance and Management Fees per GFA with Respect to Different Estate Backgrounds

Note: The starting and ending points of each floating bar are the 25th and 75th percentiles, respectively.

Although no relationship between the maintenance and management fee and the building age is found in the previous section, building age remains an essential factor influencing the maintenance and management fee in normal practice (e.g. bank mortgage). The variations in the maintenance and management fee per GFA with respect to these two backgrounds were also presented in Table 7 for reference.

The results reveal the following results.

1. The mean value of the *general* maintenance and management fee per GFA is \$14.4 per m^2, ranging from \$8.6 (25% percentile) to \$20.6 (75% percentile).
2. The average maintenance and management fee for *large estates* (GFA >10,000 m^2; \$11.8 per m^2) is lower than the fee for small estates (\$18.4).
3. Estates with a large *total common area* (area > 10,000 m^2; \$13.1) charge a much lower maintenance and management fee than those with a small common area (\$21.0).
4. The average maintenance and management fee in estates/buildings with *more floors* (number of floors >30; \$10.6) is significantly lower than those with fewer floors (\$19.0).
5. Estates with *more dwelling units* (dwelling units >1,000; \$12) charge a maintenance and management fee lower than those with fewer dwelling units (\$15.8).
6. The average maintenance and management fee of *large individual units* (unit area >100; \$22.6) is much higher than those of small units (\$15.0).
7. Estates that have *second-hand selling prices* higher than \$45,000 per square metre (\$17.9) tend to have significantly higher maintenance and management fees per square metre than those with lower selling prices (\$10.2).
8. The management and maintenance fees per GFA in large and small estates (in terms of GFA, total common area and total number of floors) and in high and low quality estates (in terms of individual unit size and second-hand selling price) clearly fall within different ranges.

6.4.2 Benchmarks of PF Monthly Expenses per GFA

Since PF managers are concerned not only with management fees but also with the expenses of PF components, the monthly expense ranges of the top 6 PF components of the different estate backgrounds are further analysed in Table 8 and illustrated in Figures 5a-5i. The results reveal the following:

1. General

a) The **total expense per GFA** ranges from \$3.5 per m^2 (25^{th} percentile) to \$8.8 per m^2 (75^{th} percentile), with a mean value of \$7.1 per m^2.

b) The average costs per GFA for the PF components of direct salary (\$2.6 per m^2), electricity supply (\$2.3) and security (\$2.2) are substantially higher than the average costs per GFA of the electrical system repair and replacement component (\$0.5).

Table 8 Variations in Monthly Expenses per GFA of the Top 6 PF Components with respect to Different Estate Backgrounds

Estate Background		Total Expenses /GFA		Total sum of direct salary /GFA		Electricity supply expense /GFA		Security expense /GFA		Electrical system repair and replacement /GFA		Cleaning expense /GFA		Lift maintenance expense /GFA	
		Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
General		7.1	3.5-8.8	2.6	0.9-3.3	2.3	1.0-2.6	2.2	0.8-3.6	0.5	0.1-0.7	1.3	0.4-2.0	1.2	0.7-1.7
GFA	**< 10,000**	8.9	3.7-9.2	4.3	3.3-6.4	3.4	0.7-6.0	5.0	3.8-6.3	0.6	0.2-0.8	1.5	0.4-2.2	1.6	1.0-2.2
	≥ 10,000	6.0	2.3-7.0	**2.3**	0.9-2.1	**1.5**	1.1-1.8	**1.6**	0.8-2.4	**0.3**	0.1-0.3	1.2	0.4-1.2	**0.9**	0.7-1.2
Total common area	**< 10,000**	8.2	3.7-9.2	3.2	1.7-4.9	2.9	0.6-5.2	3.6	1.0-5.2	0.5	0.2-0.8	1.6	0.9-2.3	1.4	0.8-2.1
	≥ 10,000	4.0	2.0-5.4	**1.3**	0.9-1.9	**1.3**	1.1-1.6	**1.4**	0.8-1.8	0.4	0.1-0.3	**0.7**	0.2-1.1	**0.8**	0.6-0.9
Total no. of floor	**< 30**	8.1	2.4-9.7	3.5	0.8-6.4	2.8	0.5-5.1	4.5	3.2-5.9	0.5	0.1-0.8	1.4	0.4-2.1	1.5	0.8-2.2
	≥ 30	6.4	4.1-7.5	2.4	0.9-3.2	1.8	1.0-2.0	**1.5**	0.8-1.8	0.4	0.1-0.6	1.2	0.3-1.3	0.9	0.7-1.3
No. of dwelling units	**< 1,000**	8.0	2.5-9.4	**3.8**	1.6-4.9	**2.6**	0.6-4.5	**3.2**	1.2-4.7	0.5	0.1-0.8	1.5	0.4-2.2	1.3	0.7-2.0
	≥ 1,000	5.5	4.5-6.2	1.5	0.7-2.1	1.4	1.1-2.0	1.3	0.7-1.8	0.3	0.1-0.5	0.9	0.7-1.2	0.9	0.7-1.2
Unit size	**< 100**	6.4	4.5-8.4	1.6	0.9-2.1	3.1	1.2-5.2	1.5	0.8-2.1	0.5	0.1-0.8	1.4	0.8-2.0	1.3	0.8-1.7
	≥ 100	12.4	3.5-21.8	**5.8**	2.0-10.5	**1.5**	0.7-2.0	**3.4**	1.3-5.2	**0.3**	0.1-0.5	2.2	0.4-3.0	1.2	0.4-2.2
2nd hand selling price	**< 45,000**	7.9	4.7-9.8	2.6	0.9-2.4	1.8	1.2-1.8	1.5	0.8-2.1	0.3	0.1-0.4	1.5	0.7-1.2	1.0	0.7-1.3
	≥ 45,000	8.3	3.5-9.6	2.9	1.6-3.4	3.3	1.4-5.8	**3.5**	0.9-5.2	0.4	0.1-0.6	1.5	0.3-2.4	**1.4**	0.9-1.9
For reference:															
Building age	**< 10**	7.1	3.5-8.7	**4.1**	1.1-7.7	**3.6**	1.0-6.1	1.9	0.5-3.8	0.5	0.1-0.8	1.9	0.7-2.4	1.4	0.9-2.0
	≥10	7.1	3.2-9.2	2.0	0.9-2.7	1.4	0.9-1.6	2.3	0.8-3.6	0.5	0.1-0.4	1.0	0.4-1.2	1.1	0.7-1.5
No. of blocks	**< 2**	6.6	2.4-8.9	3.1	1.0-5.6	3.0	0.3-5.8	3.1	0.8-4.8	0.6	0.2-0.9	1.4	0.3-2.1	1.5	0.8-2.2
	≥ 2	7.6	4.1-9.3	2.5	0.9-3.2	1.7	1.1-2.1	2.0	0.8-3.0	0.3	0.1-0.4	1.3	0.4-1.3	1.0	0.7-1.4

Note: The two values in ranges are the 25th percentile and the 75th percentile respectively

GFA – Gross floor area.

2. Mean in Different Estate Backgrounds

a) *Large estates* (GFA ≥ 10,000) afford substantially lower costs per GFA in the items of direct salary ($2.3 per m^2), electricity supply ($1.5), security ($1.6), electrical system repair and replacement costs ($0.3) and lift maintenance costs ($0.9), compared with small estates (GFA **< 10,000**).

b) Estates with a large *total common area* (TCA ≥ 10,000) have lower total costs with respect to direct salary per GFA ($1.3), electricity supply expenses per GFA ($1.3), security expenses per GFA ($1.4), cleaning expenses per GFA ($0.7) and lift maintenance costs per GFA ($0.8) than estates with a small total common area (TCA **< 10,000**).

c) Estates with a *total number of floors* above 30 pay less security expenses per GFA ($1.5) than those with a total number of floors **below 30**.

d) Estates with a small number of *dwelling units* (**< 1,000**) have higher total salary per GFA ($3.8), electricity supply expenses per GFA ($2.6) and security expenses per GFA ($3.2) than estates with a large number of dwelling units.

e) The costs per GFA for direct salary ($5.8) and security ($3.4) in estates with a large *unit area (size* **≥ 100**) is higher than those for small estates (unit size < 100), while the costs per GFA for electricity supply ($1.5) and electrical system repair and replacement ($0.3) are lower than those with small units.

f) The costs per GFA for estates with a high *second-hand selling price* (**≥ $45,000**) in the items of security ($3.5) and lift maintenance ($1.4) are on the high side compared with estates with a low second-hand selling price (< 45,000).

g) The total salary per GFA ($4.1) and the electricity supply expenses per GFA ($3.6) for new estates are substantially higher than those for old estates.

3. Variations in the Six Major PF Components

a) The variations of *total salary* per GFA in small estates (in terms of GFA, total common area and no. of dwelling units) with a large unit size are clearly higher than those in large estates with a small unit size, respectively.

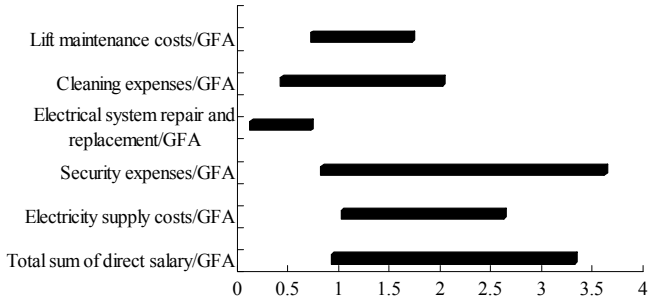
b) *Electricity supply* costs show no clear demarcation per GFA for different estate backgrounds.

c) The variations in *security expenses* per GFA in small estates (in terms of GFA and no. of dwelling units) are clearly higher than those in large estates.

d) The variations in *electrical system repair and replacement costs* per GFA and those in lift maintenance expenses per GFA in small estates (in terms of GFA and total common area) are clearly higher than those in large estates.

e) The variations in *cleaning expenses* per GFA in estates with a small common area (0.9-2.3) are generally higher than those with a large common area (0.2-1.1).

f) In general, there is no clear demarcation for PF expenses per GFA between old estates (*age* ≥ 10 years) and new estates (*age* < 10 years) and between estates with more than 2 *blocks* and those with 2 or fewer.



Note:
- Clear demarcation of PF expenses per GFA between two particular sample groups.

Figure 5a Variations in Total PF Expenses per GFA irrespective of Estate Background

- General

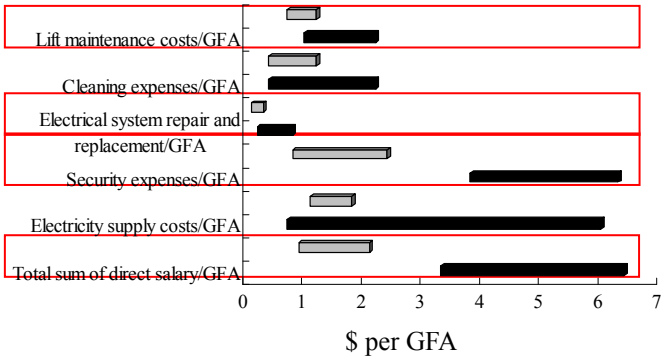


Figure 5b Variations in PF Expenses per GFA with respect to GFA

- GFA<10,000
- GFA≥10,000

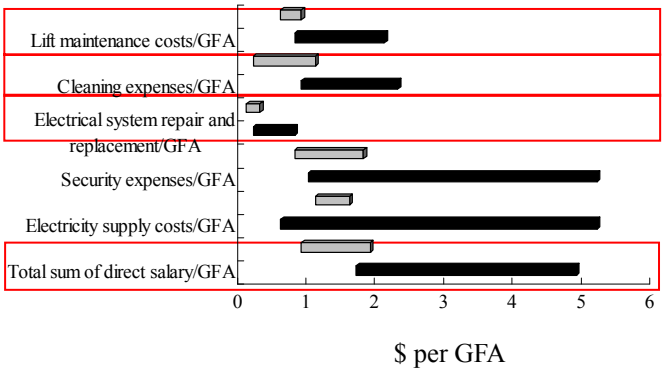


Figure 5c Variations in PF Expenses per GFA with respect to Total Common Area

- Total common area<10,000
- Total common area≥10,000

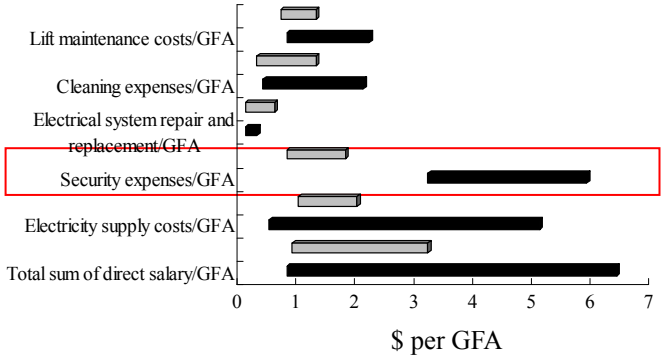


Figure 5d Variations in PF Expenses per GFA with respect to Total No. of Floor

- Total no. of floor<30
- Total no. of floor≥30

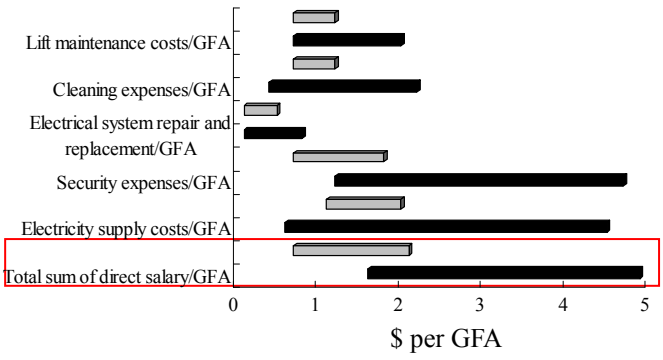


Figure 5e Variations in PF Expenses per GFA with respect to No. of Dwelling Units

- No. of dwelling units<1,000
- No. of dwelling units≥1,000

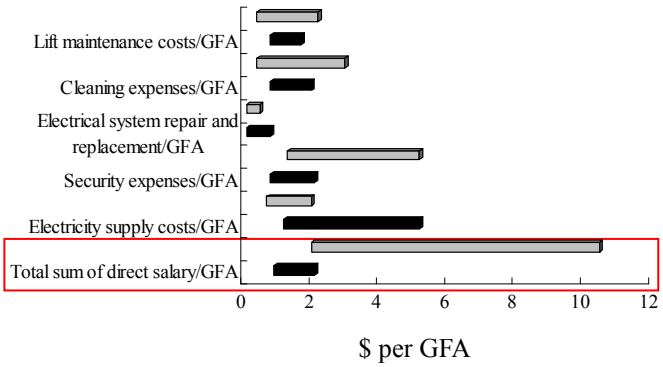


Figure 5f Variations in PF Expenses per GFA with respect to Unit Size

Unit size<100
Unit size≥100

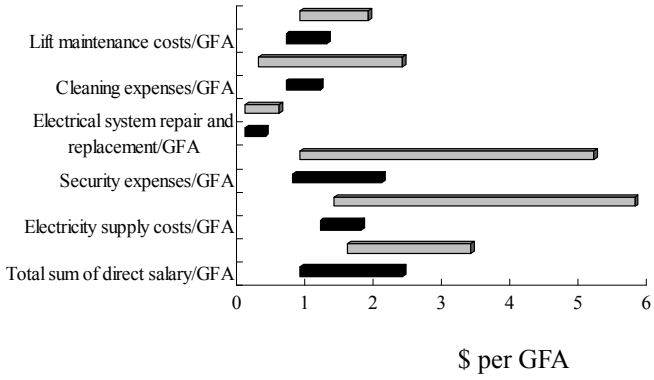


Figure 5g Variations in PF Expenses per GFA with respect to 2nd Hand Selling Price

2nd hand selling price<45,000
2nd hand selling price≥45,000

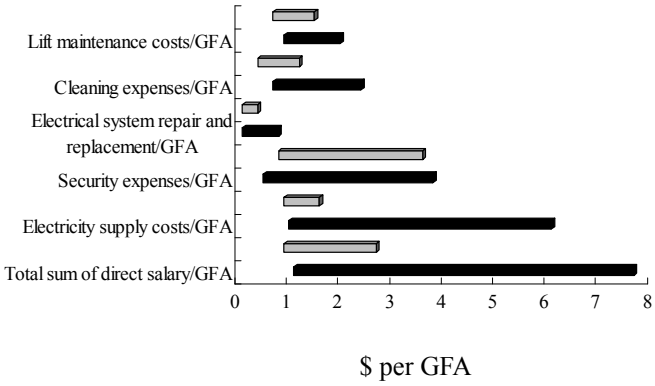


Figure 5h Variations in PF Expenses per GFA with respect to Building Age

Building age<10
Building age≥10

Figure 5i Variations in PF Expenses per GFA with respect to No. of Block

No. of block<2
No. of block≥2

7. DISCUSSION

Although it is difficult to predict the needs of residents, the number of residents in an estate/building is generally stable. PF management should be well planned. The management company *should pay close attention to the top six PF components influencing maintenance and management expenses* (i.e. the total sum of salary, electricity supply costs, security expenses, electrical system repair and replacement, cleaning expenses and lift maintenance costs), as **these 6 FM components make up over 88% of total expenses in a residential estate**. Based on the results, Figure 6 establishes a Fee–Background–Expenses model for PF maintenance and management.

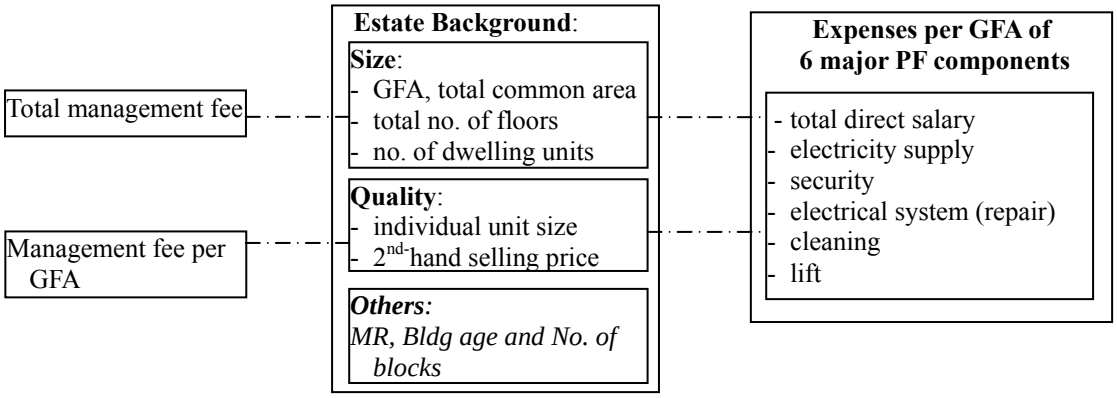


Figure 6 A Fee–Background–Expenses Model for PF Maintenance and Management

The study reveals some relationship between estate background (i.e., GFA, total common area, total number of floors and number of dwelling units) and the total maintenance and management fee, and between individual unit size/second-hand selling price and the maintenance and management fee per square metre. GFA, total common area, total number of floors and number of dwelling units all reflect the size of an estate. The **total maintenance and management fee increases proportionally according to the size of the estate** (e.g., GFA and number of dwelling units). The **maintenance and management fee per square metre is related to the quality of the estate/building**, while individual unit size and second-hand selling price can be indicators of estate quality.

7.1 Benchmarking of Maintenance and Management Fees

The maintenance and management fee per GFA is in a range from $ 8.6 to $ 20.6 with the mean value of $ 14.4. Because the estate/building background is related to the maintenance and management fee and the expenses of various PF components, the background information of an estate/building can be used as a reference point for setting the management fee of an estate/building in Hong Kong (see Table 9). The **maintenance and management fee per GFA and the PF expenses per GFA in smaller estates are all higher than those of larger estates**. However, the **maintenance and management fee per GFA and the PF expenses per GFA in**

low/medium class estates (individual unit size less than 100 m^2 and second-hand selling price less than $45,000) are **generally on the low side** compared with high class estates/buildings.

Table 9 Benchmarks of Maintenance and Management Fees and PF Monthly Expenses per GFA with respect to Different Estate Backgrounds

			Fee /GFA		Expense /GFA	
Estate Background			**Mean**	**Range**	**Mean**	**Range**
Overall			**14.4**	8.6 - 20.6	**7.1**	3.5-8.8
Size:						
Gross floor area	<	**10,000 m^2**	**18.4**	***16.7*** - 24.8	**8.9**	3.7-9.2
	≥	10,000 m^2	11.8	7.5 - ***15.2***	6.0	2.3-7.0
Total common area	<	**10,000 m^2**	**21.0**	***16.1*** - 27.5	**8.2**	3.7-9.2
	≥	10,000 m^2	13.1	9.4 - ***17.2***	4.0	2.0-5.4
Total number of floors	<	**30 no.**	**19.0**	***14.5*** - 24.8	**8.1**	2.4-9.7
	≥	30 no.	10.6	4.5 - ***15.1***	6.4	4.1-7.5
Number of dwelling units	<	**1000 no.**	**15.8**	7.3 - 21.5	**8.0**	2.5-9.4
	≥	1000 no.	12.0	9.2 - 14.8	5.5	4.5-6.2
Quality:						
Individual unit size	<	100 m^2	15.0	10.3 - ***18.3***	6.4	4.5-8.4
	≥	**100 m^2**	**22.6**	***16.3*** - 29.0	**12.4**	3.5-21.8
Second-hand selling price	<	$ 45,000 m^2	10.2	7.4 - ***12.3***	7.9	4.7-9.8
	≥	**$ 45,000 m^2**	**17.9**	***12.4*** - 22.3	**8.3**	3.5-9.6

Note: - The two values in ranges are the 25th percentile and the 75th percentile respectively.
- Building age and number of blocks are not major factors influencing the PF maintenance and management fee for residential estates and buildings. Their figures could refer to Tables 7 & 8.
- Italic ***Data*** in bold represents the ranges between the two groups in the same background are clearly defined.

The maintenance and management fee per square metre in an estate/building with fewer than 1,000 dwelling units ranges widely ($7.3 - $21.5), while those in estates with more than 1,000 dwelling units falls within a comparatively narrow range ($9.2 - $14.8). Therefore, it would be difficult to set a precise maintenance and management fee per square metre based on the number of dwelling units, especially for those with fewer than 1,000 units.

There are some overlapping ranges in maintenance and management fees per square metre between the two groups of building age ($3 - $19.5 and $15.1 - $21) and number of blocks ($8.6 - $21 and $8.9 - $17.2), but the management fee per square metre of an estate can still be clearly defined, especially based on the GFA, total common area, total number of floors, individual unit size and second-hand selling price. The study *recommends that property/facility management companies and owners set the maintenance and management fee per square metre based on the range of estate backgrounds (GFA, number of blocks, total number of floors, individual unit size and second-hand selling price),* as indicated in Table 9.

7.2 Benchmarking of Maintenance and Management Expenses

The **total monthly expenses per GFA** range from $3.5 to $8.8, with a mean value of $7.1. The study *revealed that estate background information is not a good indicator of total PF expenses per GFA,* as there is no clear demarcation of the total expense ranges of the PF components per GFA between any two groups within the 6 estate backgrounds (refer to Table 9).

Six PF components, including the total sum of direct salary, electricity supply costs, security expenses, electrical system repair and replacement costs, cleaning expenses and lift maintenance costs), make up 88.31% of total maintenance and management expenses for residential housing in Hong Kong. The average monthly expense per GFA for the PF components of direct salary ($2.6/GFA), electricity supply ($2.3) and security ($2.2) are substantially higher than that for the electrical system repair and replacement component ($0.5) (see Table 10).

Table 10 Benchmarks of Monthly Expenses per GFA of the Top 6 PF Components

Top 6 PF Components	Mean	Range
Total sum of direct salary/GFA	2.6	0.9 – 3.3
Electricity supply costs/GFA	2.3	1.0 – 2.6
Security expenses/GFA	2.2	0.8 – 3.6
Electrical system repair and replacement/GFA	0.5	0.1 – 0.7
Cleaning expenses/GFA	1.3	0.4 – 2.0
Lift maintenance costs/GFA	1.2	0.7 – 1.7

Note: the two values in ranges are the 25th percentile and the 75th percentile respectively.

The expenses per GFA for individual PF components are related to the backgrounds of particular estates (refer to Table 8). The variations in total salary per GFA of small estates (in terms of GFA, total common area and no. of dwelling units) with a large unit size are clearly higher than those of large estates with a small unit size. Both GFA and total number of floors can be used to establish the security expenses per GFA of residential estates, while the GFA and total common area can be applied to identify the total salary per GFA, the electrical system repair and replacement costs per GFA, the cleaning expenses per GFA and the lift maintenance costs per GFA in both large and small residential estates/buildings.

8. FURTHER RESEARCH

Because of the sensitivity of the data (including actual expenses and fees of residential estates), 41 sets of data were collected. In fact, out of 41 samples, only 3, 4 and 6 samples provided a gym room, clubhouse and sport facilities in the estate/building, respectively. No any PF component collected the samples more than

31 (a minimum sample for statistical analysis). Therefore, it is thus **strongly recommended that more data be collected** before the results are applied to establishing benchmarks for the maintenance and management fees of residential estates/buildings as found in the study. This pilot study does, however, establish a good platform for a large-scale survey in the next stage.

The study identifies the benchmarks for maintenance and management fees based only on estate background (e.g. GFA, second-hand selling price, etc.) and the correlations between expenses and fees. This research method does not consider the quality of property/facility management, since high expenses in property and facility management may not induce good quality performance. **To establish a comprehensive benchmarking system, the satisfaction of end-users should also be considered in the future**.

The study reports the benchmarks of management fees based mainly on estate/building background. In fact, maintenance and management fees may vary based on a **combination of different estate backgrounds**, such as building age (old and new buildings) and GFA (large and small estates), building age (old and new buildings) and individual unit size (low and high class flats), and so forth. Further research with more sets of data will support the results of this study in establishing a valid benchmarking system for residential estates and buildings in Hong Kong.

It is interesting to note that the study finds no relationship between building age/MR and the maintenance and management fee. Perhaps some major renovations are not being included in the daily expenses and fees. Further study is recommended **to investigate major renovations being done in aging estates/buildings** and **how the MR and administration fee are decided in an estate/building** in Hong Kong.

9. CONCLUSION

Although there are a number of property/facility management companies that manage residential estates/buildings in Hong Kong, formal studies identifying benchmarks for these estates/buildings are lacking. To identify a fair PF maintenance and management fee for residential estates/buildings, it is essential that this fee be benchmarked. The literature has revealed 24 PF components under 6 major factors.

This study identified 20 top PF component factors affecting maintenance and management expenses; the major six PF components covering 88% of total expenses consist of the total sum of direct salary, electricity supply costs, security expenses, electrical system repair and replacement, cleaning expenses and lift maintenance costs. *To control and monitor maintenance and management expenses, it is suggested that*

property managers and owners concentrate mainly on these six PF components.

The results of correlation analysis revealed no significant relationship between the maintenance and management fee and building age/MR. However, the total maintenance and management fee was significantly and positively related to the *size of the estate* (e.g. GFA, total common area, total number of floors, and number of dwelling units). The maintenance and management fee per square metre was correlated with the *quality of the estate/building* (e.g. individual unit size and second-hand selling price).

The benchmarks for the maintenance and management fees per GFA and the PF monthly **expenses** per GFA range from $8.6 to $20.6 per m^2 and from **$3.5 to $8.8 per m^2** with mean values of **$14.4** and $**7.1 per m^2**, respectively. Since estate background is related to the maintenance and management fee and the expenses of various PF components, the background information for estates/buildings in Hong Kong is considered to be a reference point for setting management fees. This study *recommends that the maintenance and management fee per GFA can be set based on the range of estate backgrounds (GFA, total common area, total number of floors, individual unit size and second-hand selling price)* (refer to Tables 7 and 9), while *the expenses per GFA for individual PF components are related to the backgrounds of particular estates* (refer to Table 8).

To develop a comprehensive benchmarking system for the maintenance and management fees of residential estates/buildings, it is strongly recommended that more data be collected and the data be further analysed with a combination of various estate/building backgrounds. The satisfaction of end users could also be considered in the overall study. The current study, however, has established a good platform for a large-scale survey in the next stage of setting an applicable benchmarking index in the industry.

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Appendix I

Questionnaire :

Benchmarking of the Maintenance and Management Fees for Residential Housing in Hong Kong –Survey for Management Company

1. Background of Estates

1.1 The location and age of the property is _____

1.2 Please provide the second-hand selling price ($/m2) of this property._____

1.3 Please provide the management fee ($/m2) of this property._____

1.4 Please provide the M.R. of this property_____

1.5 Please provide some information on the architectural design of this property.

- Number of blocks _____
- Number of floors/blocks_____
- Number of dwelling units_____
- Gross floor area_____
- Total common area_____

1.6 Are there any entertainment facilities or outsourced services in the managed area? Please provide the operation cost/ outsourced contract sum per year and size.

Swimming pool _____

Club house _____

Playground _____

Gym room _____

Sport facilities _____

Others :

_____

_____

_____

1.7 Please provide the Property Management team salary. _____

2. Expenses of Property /Facilities

PF Components	Cost
Building Services	
Electrical supply power	
Electrical system repair and replacement	
Water supply & drainage	
Pumping & drainage	
Lift and escalators maintenance	
Environmental	
Cleaning	
Landscaping	
Decoration	
Security and Safety	
Fire service system	
CCTV/ security control system	
Security maintenance	
Infrastructure	
Building repairs	
Management	
Management office	
Stationery	