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Editorial

Where to draw the line?

The exactitude of a land boundary line is a relevant economic, legal and even political matter where the value of land is determined by precise location and site area. To developers in Hong Kong, this is a well understood matter as valuation of land is almost impossible without ascertaining its geodetic details to work out the location-specific Gross Floor Area.

While delineation of property boundaries in the urban area is often straightforward because they are often rectilinear and well defined by public roads and pre-existing objects, their determination in a rural area, due to the topological nature of the DD map sheets, is often a great pain to developers. The courts in fact consider that the measure of uncertainty of a property border line drawn on such sheets is some 3 metres wide. This is not unreasonable given reliance on mapping, even though modern surveying techniques are so accurate that the variance is technically as little as 1 mm. As society becomes more litigious due to a combination of social factors, including wider spread of legal knowledge, and an escalation in land values, the uncertainty can only resolved by the courts.

Though the real need for accurate planimetric details for leasing a flat available for site inspection is doubtful, precision in delineation of boundaries of property units, especially first hand ones, has become a legal requirement to protect purchasers as consumers. Nonetheless it follows that precise mapping of private property is not always and everywhere essential for market transactions.

In Imperial China, though the know-how and techniques of accurate land surveying were not wanting, officials deliberately held back from conducting regular national cadastral surveys to update the county land tax registers. While officialdom had a strong selfish interest in perpetuating this state of affairs, there were interesting consequences. In a context where land tax was levied “forever”, the state maintained stability by capping payments due. This encouraged opening up unreported new cultivation areas and also more births. Hidden wealth was therefore accumulated in the private sector or “hidden in the populace”. At the same time population growth accelerated.

Land transactions in Imperial China were recorded by deeds that had lots of moral exhortations but no mapping description. Land boundaries were poetically rather than scientifically depicted. However, there was always an area specified in any deed.

Land, therefore, was used purely as an input for agricultural produce rather than treated as a bundle of locationally significant rights for accommodating fixtures now called real estate. Open disputes were locally resolved by the village elders, failing that the county magistrate. Eyewitnesses' opinion was important and production of competing measurement claims was little known.

There are infinite ways to measure or value a piece of land, as an asset or liability. Any measurement criterion selected suits a particular objective and incurs the costs of not using another. Planimetric assessment contested in court is only a recent historical phenomenon. The same flexibility of approach can apply to treatment of officially unauthorized development. Squatters, when understood as either developers of development or producers of new products, will be granted a degree of entitlement under a new policy. Understood otherwise they will be duly evicted to conform with the law. Our public housing policy and marine fish culture licensing system are also cases in point.

This flexibility of approach is not against the rule of law. It is better understood as legalism. After all, law is, or should be the servant of the rights proper to human existence. When one insists on a line drawn on the map and uses it to assert, defend or exercise rights, one must understand the costs of insisting on such an approach both for oneself and for others.

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Surveying & Built Environment

Facilities Management and the Theory of the Firm

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ABSTRACT

This paper studies various interpretations of the concept "facilities management" and offers the view that its emergence as a profession emphasising integrative and coordinating assets, activities and information is an economic response to new demand in terms of Ronald Coase's theory of the firm, as re-interpreted by Steven Cheung, and applies this view to interpret some Hong Kong events that can be described as failures in facilities management.

KEYWORDS

Facilities management; globalisation; property rights; public domain; privatisation; outsourcing; specificity, theory of the firm

INTRODUCTION

FM as an emerging global professional, research, and educational phenomenon

"Facility management" or "facilities management" (FM) is a relatively new, but well-received concept that has gained social and economic recognition through the creation of international, national, and regional professional institutes. The United States, the United Kingdom, Australia, China (including Hong Kong), Japan, the Netherlands, Finland, and many other countries have set up professional FM bodies. The largest body is probably the International Facility Management Association (IFMA), which has already established 129 chapters worldwide.[1] Another body is the European Facility Management Network (EuroFM), which connects the FM bodies of 23 European countries.[2] In 2010, a global alliance of professional bodies called "Global FM" was established, incorporating 10 professional FM bodies all over the world.[3]

Other established professional bodies, such as the Royal Institution of Chartered Surveyors (RICS), Chartered Institution of Building Services Engineers (CIBSE), and Chartered Institute of Builders (CIOB), have also explored opportunities to make a contribution to this growing area of activity. Each has an FM division (known as professional group, group, and society, respectively). Indeed, most pioneers in facilities management research and practice are members of these established bodies.

International organisations, notably the International Council for Building Research Studies & Documentation (CIB), have long promoted research on FM. A good example is the Working Commission W70 on Facilities Management and Maintenance. Since 1979, 17 international conferences on facilities management have been held **(Table 1)**. Many of these conferences focused on specific dimensions of "facilities", e.g. those in 1996, 1998, 2000, 2004, 2008, 2010 and 2014. In addition to CIB, the EuroFM and IFMA have also organized FM research symposia in Europe and North America on an annual basis since 1995.

Journals on facilities management have mushroomed. The academic and professional journal, *Facilities*, edited then by Reading University in the UK, published its first issue in 1982. The journal *International Journal of Facilities Management*, run by EuroFM, emerged in 1997. The *Journal of Facilities Management*, based in Heriot-Watt University, appeared in 2002. Industry-based journals, such as the *Facility Management Journal* published bi-monthly by IFMA, have also a growing circulation.

[1] See http://www.ifma.org/community/local-chapter-map for details.
[2] See http://www.eurofm.org/about-us/about-eurofm/ for details.
[3] See http://globalfm.org/member-organisations for details.

Table 1 CIB W70 International Conferences, 1979-2014

Year	Place	Topic
1979	Rotterdam, Netherlands	Research on Maintenance & Modernisation
1981	Tallberg, Sweden	Methods of Surveying and Describing Building Stock
1983	Edinburgh, Scotland	Systems of Maintenance Planning
1988	Edinburgh, Scotland	Whole-life Property Asset Management
1990	Singapore	Building Maintenance & Modernisation
1992	Rotterdam, Netherlands	Innovations in Management, Maintenance and Modernisation of Buildings
1994	Tokyo, Japan	Strategies and Technologies for Maintenance and Modernisation of Buildings
1996	Helsinki, Finland	User-oriented and Cost Effective Management, Maintenance and Modernisation of Building Facilities
1998	Singapore	Management, Maintenance and Modernisation of Building Facilities
2000	Brisbane, Australia	Providing Facilities Solutions to Business Challenges
2002	Glasgow, Scotland	Applying and Extending the Global Knowledge Base
2004	Hong Kong, China	Human Elements in Facilities Management
2006	Trondheim, Norway	Changing User Demands on Buildings
2008	Edinburgh, Scotland	Achieving Healthy and Creative Facilities
2010	Sao Paulo, Brazil	Facilities Management in the Experience Economy
2012	Cape Town, South Africa	Delivering value to the Community
2014	Copenhagen, Denmark	Using Facilities in an Open World – Creating Value for All Stakeholders

Source: http://www.cibworld.nl/site/databases/meetings.html

Meanwhile, on the educational front, universities have offered new courses and specific degree programmes in facilities management. **Table 2** lists these courses and degrees in major universities in the USA, the UK, Australia, Singapore, and Hong Kong.

Table 2: Examples of degree courses in FM offered by universities

University	Degree course*
United States of America	
Brigham Young University	BSc(FM)
Cornell University	BSc(FM), MSc(FM)
Ferris State University	BSc(FM)
Georgia Institute of Technology	MSc(Building Construction & Integrated FM)
Wentworth Institute of Technology	BSc(Facilities Planning & Management)
United Kingdom	
Heriot-Watt University	MSc(FM)
Napier University	MSc(FM)
Sheffield Hallam University	BA(FM), MBA(FM)
University College London	MSc(Facility & Environment Management)
University of Central England	MSc(FM)
University of Greenwich	MSc(FM)
University of Lancashire	BSc(FM)
University of Salford	MSc(FM)
University of Westminster	BSc(FM), MSc(FM)
Australia	
Bond University	Bachelor of Property
Deakin University	Master of FM
University of Southern Australia	Master of Facilities and Asset Management
Singapore	
National University of Singapore	BSc(Project and FM)
Hong Kong, China	
Hong Kong Polytechnic University	MSc(FM)
University of Hong Kong	MSc(Real Estate), with an option of major in FM

USA Source: http://www.ifma.org/learning/recognized/degree.cfm
UK Source:
http://www.bifm.org.uk/bifm/careerdevelopment/education/bifmqualification/highereducationroute/providers
Australia Source: http://www.fma.com.au/cms/index.php?option=com_content&task=view&id=43&Itemid=57

*excludes distance-learning courses and postgraduate diploma courses

While the above provides only a brief overview of the development of FM in the past 30 years and is by no means exhaustive, suffice it to say that FM is an emerging global professional, research, and educational phenomenon. Yet, despite the efforts made by FM practitioners and researchers, the concept of FM is still not clear in many people's minds. This is best evidenced by the recurrent search for a clearer concept of FM (e.g. de Bruijn, et al., 2001; Tay and Ooi, 2001). Perhaps the development of FM in the past 30 years from an industrial perspective was best summarised by Cairns and Grimshaw (1999):

> FM's development over the past three decades has been major emphasis in the area deemed to be covered by the subject: it has evolved from an initial concentration upon management of the physical attributes of the workplace in major office-based organisations, to become an integrated study of the management of the social and physical environments of business organisations, leisure providers, and housing suppliers. As the delivery context of FM has expanded, there has also been a change of emphasis in the intellectual capital of the subject: it has developed from being a largely reactive operational discipline, to being considered by a growing number of organisations as a key strategic contributor to their effectiveness. Also, from its original conception in the United States and Europe, FM has developed geographically to become a global phenomenon (Cairns and Grimshaw 1999: A17).

However, it is one thing to say that the field has been globalised and intellectualised, but quite another to say that the concept of FM is clear enough.

> FM's development can only be sustained by a continuation of the situation in which the field of FM is very loosely defined. It must remain accessible to all intellectual approaches and refuse to be confined within any box unlike the traditional professions, from whose blinkered thinking FM can only benefit (Cairn and Grimshaw 1989: A21).

> ....indeed FM and other recent phenomena like 'sustainability' may herald new ways of addressing complex problems that do not rely on the old scientific paradigms (Cairn and Grimshaw 1989: A23).

The above quotes from Cairn and Grimshaw (1989) cryptically depict the strength and weakness of FM as an emerging profession. The absence of a clear concept on FM means that "rent-seeking" by involved professionals (Tullock 1967) is possible, especially since the field is accessible by members of established professions. This club-like entry situation could be fertile ground for new ideas and practical innovations, but could also be highly frustrating to those who seek to promote further and better research. It is predictable that experts from various fields would in due course partition this field of research into specialised territories. Some useful hints about

such partitioning can be found in the paper by Grimshaw (2003) that, developed on a review of the works of Nutt (1999, 2000), Green and Price (2000) and Grimshaw and Cairns (2000), characterised FM in terms of its technical, economic, strategic, social, service and professional functions.

This paper seeks to work out a clearer economic concept of FM that focuses on its uniqueness in terms of Coase's theory of the firm (1937), which was developed further by Cheung (1983). This theoretical inquiry involves an examination of existing definitions of FM adopted by various professional bodies and the ideas of Coase. Some Hong Kong mistakes in the FM field will be discussed for illustrative purposes.

INTERPRETATIONS OF FACILITIES MANAGEMENT

This section reviews the prevalent interpretations of FM by analysing keywords in the definitions adopted by various professional institutions. It will show that most of these interpretations have defined an "integration" role for FM, which is highly pertinent for articulation with the ideas of Economics Nobel Prize winner Ronald Coase.

The United States-based IFMA was formed in 1982. Before publication of CEN (Comité Européen de Normalisation, the European Committee for Standardisation) on the definition of FM, the American definition of FM was: "a profession that encompasses multiple disciplines to ensure the functionality of the built environment by integrating people, place[s], process[es] and technology" (http://www.ifma.org). The keywords are "functionality," "built environment," and "integrating".

The British Institute of Facilities Management (BIFM) was established in 1993 (http://www.bifm.org.uk). The British definition of FM was similar to the American one in emphasising the "built environment" and "integration". It read: "the integration of multi-disciplinary activities within the built environment and the management of their impact upon people and the workplace".

Since the publication of EN 15221-1 in 2006, both IFMA and BIFM adopted the definition of FM as "Integration of processes within an organization to maintain and develop the agreed services which support and improve the effectiveness of its primary activities".

The Facility Management Association (FMA) of Australia was established in 1989. The FMA is currently working towards a single definition of FM. It indicates: "facilities management transverses all public and private organisations, covering a broad spectrum of activities from strategic operational planning to daily physical maintenance, cleaning and the management of environmental performance issues." (http://www.fma.com.au).

The Hong Kong Institute of Facility Management (HKIFM) was inaugurated in September 2000. The Hong Kong definition, which is wider in scope,

is similar to other institutes. It reads: "the process by which an organization integrates its people, work process[es] and physical assets to serve its strategic objectives" (http://www.hkifm.org.hk). The keywords are "organisation," "integrates," and "objectives".

The Japan Facility Management Promotion Association (JFMA) was established in 1987. It defines FM as: "a comprehensive management approach for the optimization of the ownership, utilization, operation, and maintenance of business real properties (land, buildings, structures, equipment, etc.) and maintaining them in optimal condition (minimum costs & maximum effects), so that they contribute to the overall management of the business." (http://www.jfma.or.jp). Like all the above definitions, there is an emphasis on the enterprise or organisational aspects of management.

The emphasis of FM on integration by all institutions would be of particular relevance in the subsequent discourse on Coase's theory of the firm. However, before we come to Coase's ideas, there is a need to appreciate the nature of "facilities".

According to Kaiser, facilities include "buildings, grounds, utilities and equipment, and typically represent a majority of an organisation's capital assets" (Kaiser, 1989, p.3). Like built assets, these were regarded as part of overhead, and were originally managed by a financial officer with the help of administrative staff. For larger companies or organisations, responsibility for maintaining these facilities was divided among individual departments, with no single body coordinating or being accountable for facilities decisions.

According to Becker (1990), the drive towards a new concept of facilities management was necessitated by several factors. They are: (a) globalised competition, which necessitates greater organisational efficiency for survival (notably in plant operations and maintenance); (b) the increasing cost of space and complex space demands; (c) growing employee expectations; (d) the high cost of mistakes (hence the increased demand for greater technical and management expertise in planning and building space); and (e) the challenge of new technologies (especially IT), innovative materials, and work procedures.

This new view regards facilities as an organisation's assets and promotes their proactive management. In such a management approach, better "coordination", "integration", "organisation", which are echoed in all the interpretations of FM, is a basic feature:

> As a discipline, facility management is the science and art of managing this integrative process from operational to strategic levels for promoting the competitiveness of organizations. (http://www.hkifm.org.hk).

CHEUNG'S CONTRACTUAL NATURE OF THE FIRM AND FM

One way to make sense of the role of FM as the "coordination" or "integration" discussed above in terms of economic theory is to focus on the changes in the institutional and contractual nature of organisational operations from the stance of Coase's theory of the firm (1937), as reinterpreted by Cheung (1983). Coase obtained his Nobel Prize in economics in 1991 for his paper, "the Nature of the Firm" (1937), written when he was an LSE student. It was in this paper that the idea of transaction cost as the cost of using the market was advanced to explain the phenomenon of organised production. In fact, an equally important later work of Coase, "The Problem of Social Cost" (1960), is equally applicable towards a discussion of resource management in general (Lai 2006) and facilities management (Lai and Ho 2003), particularly in terms of the concept of access restriction in tackling the problem of the so-called "tragedy of the commons". We shall, however, limit our attention to Coase's theory of the firm in this paper.

Although FM experts and scholars continue to seek better expressions to pin down FM as an arena, there is no dispute that FM matters have an element of *"overhead cost"* and are largely matters that are *shared* by, *jointly used, or claimed* by a diverse set of stakeholders within and without the organisation.

The concepts of overhead, or fixed, cost and the problem of shared or joint resources pertain to the existence of a "firm". This firm refers to an organised way of coordinating transactions between the consumer and the resource owner, and according to Coase (1937), is a means to reduce the transaction costs of using the market. The costs reduced by the firm are those costs of caveat-emptor sales between consumers and unorganised resource owners (Lai 2000). The firm incurs its own costs of internal management. Traditionally, these internal costs include costs of ensuring that employees are maintaining productivity (i.e., minimising "shirking") and costs of allocating shared resources and facilities to various internal divisions or individuals. If there is a mismanagement of shared resources, the "public domain" problems of neglect, overuse, and abuse will occur. The firm replaces the market, as it can substantially reduce the number of contracts that have been made and enforced, and thus reduces the associated transaction costs, among a large number of individual consumers and atomistic suppliers of inputs. According to Cheung (1983), it is more correct to regard a "firm" as a kind of contractual arrangement suitable for organised production that supersedes another kind of contractual arrangement that does not involve organisation.

According to Cheung, the *corollary* of the above discussion of the reason for the firm is: if the cost savings in caveat-emptor contracting become less significant compared to the growing internal cost of contractual performance, a firm will either shrink in size or revise its internal management to recoup its lost competitive advantage over market

transactions, or both.

The contraction of a firm may be through downsizing, redundancy (i.e., *dismissing* employees), or *outsourcing*, which is a means to externalise once internal activities through hires or piece contracts. This can be conceived in the recession (i.e. "downsizing") of the Coasian firm towards a Coasian market type of production. In between the idealised Coasian firm (complete in-house production with no outsourcing) and market (complete decentralisation and outsourcing), there exists a spectrum of outsourcing alternatives ranging from forming long-term strategic alliances with suppliers to hiring temporary workers (Arnold, 2000; Fill and Visser, 2000).

Of whatever degree, outsourcing is often believed to offer such advantages as lower costs and more specialized skills (Lankford and Parsa 1999). Van Mieghem (2001) developed a model to show that outsourcing contracts can resolve demand uncertainties. Unlike Coasian models, Mieghem's approach is game-theoretic and would not be relevant for choice-theoretic economic analysis.

However, outsourcing can also lead to the problem of losing control of the input supplier. Grover, *et al.* (1996) found that organization performance was compromised when outsourced activities had high asset specificity. According to received theory on specificity that springs from the seminal work by Klein, Crawford, and Alchian (1978), an arrangement such as outsourcing or C.O.D. terms will dominate where a contractual relationship is easily replaceable. Yu developed a model expressing this relationship (Lai and Yu 2003):

$$T=f(u(s).s) \text{ with } f_1>0,\ f_2>0, \text{ and } u<0,$$

where t is transaction cost, u is uncertainty, and s is specificity. Yu's equation can be generalised to discuss the situation of labour. Predictably, where inputs inside a firm are not protected by brand names to overcome problems of specificities in human capital, they are liable to be outsourced.

FM is an innovation in internal management with specific attention being paid to the allocation of shared resources or facilities within an organisation. For instance, Brochner, *et al.* (2004) identified three types of FM coordination in office buildings in which shared services were provided either by property owners, FM service providers, or tenants themselves. They attributed the choice of coordination mechanism to various costs involved, namely: (1) searching and selecting service providers prior to contracting; (2) specifying the outsourced service and negotiating the price during contracting; and (3) monitoring performance after contracting.

Whenever the costs of externalising the shared facilities are lower than conserving them as internal functions, outsourcing will be adopted. Yik and Lai (2005), following this line of thought, used the transaction cost framework to understand the outsourcing of building services' operations and maintenance. The growing importance of FM outsourcing can also be exemplified by the

proliferation of related studies in recent years. Examples are those by Roberts (2001); Incognito (2002); Salonen (2004); Usher (2004); Hassanain and Al-Saadi (2005); Reid-Thomas and Phillips (2005); Winters (2005); and Browne and Wheeler (2006). But, as one of our case studies will reveal, outsourcing generates the FM need for a good specification of tasks, monitoring, and coordination, or even a determination as to the appropriateness and extent of outsourcing.

From the FM literature, we can see that the one possible economic explanation for the crisis that fosters the emergence of an FM function within a firm is the growing awareness by shareholders and company directors that *the traditional "long run" for a certain production or service may never occur.* According to neo-classical economics, the long run is a scenario in which all factors of production are variable and their costs can be adjusted to revenue at the margin. In the short run, there is at least one fixed factor. The short run is usually transformed into the long run through economies of scale and/or improved methods of production due to learning by doing. The real life development of rapid changes in technologies (especially information technologies), taste formation, and other factors used to be held constant, not to mention the governance or existence of the firm itself, meaning that any product or service of a firm would likely witness only a 'short run' cycle. But if this were the case, how could a firm deal with fixed costs?

The outright externalisation of relevant fixed factors by outsourcing is one answer. Such externalisation, to reiterate, may be regarded as a reversion of Coasian firm activities to market transactions. However, the assignment of a new FM function that converts fixed factors into variable costs without undergoing the neo-classical stage of economies of scale is a quantity-laden concept. How could this happen? That firms still exist with resource-using FM functions implies that this function must have greater benefits than costs, discounting the alternative explanation is institutional inertia/politics which can result in economically sub-optimal outcomes because they are institutionally/politically/socially preferred. A facilities manager could make a great contribution not only to the quality dimension of outsourcing, but also to its limits and the objective conditions of these limits (say specificities and brand names), and this must be the *raison d'etre* of FM.

SOME HONG KONG MISTAKES AS FM LESSONS

A series of resource wasting events involving the lack of coordination among facilities, their managers, and users, as well as the wider institutional setting of society, occurred in the past few years in Hong Kong.

In Summer 1998, the new Hong Kong International Airport at Chek Lap Kok was finally completed, and as it started operations, the original Kai Tak Airport was closed down. This highly publicised and real-time televised "airport-relocation" exercise created much operational chaos, as the new airport's computer system, a

sophisticated coordination intelligence device, was found to be less than perfect when the old one shut down. This caused huge losses for freight forwarding businesses (*SCMP*, 1998b). The relocation exercise was a one-off and irreversible move, and it appeared that no one had anticipated the problem. No rehearsal had been made to tackle it. Nor had there been any contingency plan. A breakdown in the coordination between front-line operating staff at the cargo and passenger terminals, who were unfairly blamed, was apparent. The event was later investigated and audited by three different government parties, namely the Commission of Inquiry (Woo and Cheng 1999), the Office of the Ombudsman (1999), and the Legislative Council (1999).

The operation of the new airport almost coincided with the inauguration of the new "Hong Kong Special Administrative Region Government" ("HKSAR Government"). In fact, six months before the opening of the new airport, the then-Chief Secretary for Administration Anson Chan, assured the public that "the July 6 date had been picked [as the opening date] because the Government wanted Chek Lap Kok to be a first-class international airport from day one" (*SCMP*, 1998a). Since then, despite having foreseen possible teething problems, no suggestion was ever made to postpone the opening date. The cause of the "loss of face" and losses in money was diagnosed as simply a matter of "technical failures". For instance, the inquiry report stated that "the two main culprits for the chaos on airport opening day were the deficiency of the Flight Information Display System and the breakdown of the Cargo Handling System" (Woo and Cheng 1999, p.A). However, the relocation chaos is better described as a matter of FM failure. The issue was, in fact, not the fault of any one person, as "bygones are bygones". Nor was there any doubt that the design of the airport is wonderful. An FM insight is that for any exercise that is not normal (not routine) to an organisation, extra care must be taken to anticipate accidents and mistakes. In this case, this merits the appointment of specialist consultants and operators. A more important insight is the need to develop a mechanism to anticipate and react to crises of this scale. One important aspect of this mechanism is an effective coordination and information integration system that has a learning capability. The airport saga has, sadly, not fostered a mature FM concept in Hong Kong, and such an FM failure was, in many ways, repeated later on.

A sad case occurred in August 2000, when a mentally handicapped student, Yu, with little ability to communicate verbally and possessing no personal ID, boarded a train that took him to the Hong Kong-Shenzhen border (*SCMP*, 2000). Hong Kong immigration officials thought he was an illegal immigrant from China and turned him over to their Mainland counterparts across the Shenzhen River via an enclosed bridge. This bridge, a shared facility, is by convention not manned by officers from either jurisdiction. The Mainland authorities first refused Yu entry, but later relented. Yu has vanished without a trace since then, and the event was highly criticised by the general public. The mistake on the part of the Hong Kong authorities was

their presumption that a person who fails to produce an ID is automatically an illegal immigrant. This surely involved an element of prejudice and lack of common sense. However, the saga can also be considered an FM failure due to the poor coordination of two jurisdictions concerning the movement of people across the border. The inter-jurisdictional regulation of the cross border flow of people, which necessarily involves the sharing of facilities and information, obviously needs better coordination.

When the University of Hong Kong moved one of its medical facilities to a new building in January 2003, there was neither an inventory of all old assets nor an on-site supervision of the relocation by staff with a sufficient level of responsibility and experience. Contract removal workers moved the "obvious" facilities from the old building to the new one and dumped the less obvious human body parts into a public landfill (*SCMP*, 2003). Like the airport relocation saga, the costs of complacency and recklessness were economic costs, disrespect to the deceased, and a public relations disaster for the affected institution. This was clearly an FM failure because "outsourcing" was wrongly applied to handle a delicate operation involving the disposal of body parts when the labour market has not developed the necessary expertise to perform the task at hand. There was a gap in inventory management as well, as in task specification, coordination, and the supervision of contract staff for the relocation of medical facilities and other materials.

The notorious spread of Severe Acute Respiratory Syndrome (SARS) in Hong Kong in Spring 2003, after repeated government assurances that "there is no outbreak" and the revelation of the suppression of information by officials on the Mainland about the spread of the disease, was also a significant lesson in FM failure.[4] The lesson is that such a crucial issue common to all should have been handled by medical professionals. In the SARS case, the gaps in decision making at the societal level were closed much later. In the realm of estate management, certain property managers should be credited for their quick thinking actions, such as stepping up public hygiene measures and providing the necessary information on preventive measures, which were decisive factors in halting the spread of the epidemic. After the crisis, research efforts at this level have focused on not only the physical design and quality of buildings, but also the quality of their management and the differential effect of government responses to major crisis (Lai, et al 2006). This is the correct approach, as it is not buildings *per se* that spread SARS, but the ways they are used by occupants under a certain way of governance of public areas, as well as society's response to a collective threat. Policy-wise, a much-improved communicable disease surveillance and notification system between the Mainland and Hong Kong has since been established (HKSAR Government 2005, pp.19). This system has worked well in tackling the recent avian flu problem.

[4] See the report produced by the SARS Expert Committee (2003) for details.

CONCLUSION

This paper, using the Coasian theory of the form, argues that FM has a central focus on the integration or coordination of activities. Real world examples from Hong Kong were used to demonstrate the significance of this focus. The "teething problems" of switching passenger and cargo flights from the old Kai Tak to the new Chek Lap Kok International Airport, the "repatriation" of a mentally handicapped Hong Kong teenager through a border check point, the transporting and dumping of human body parts used for medical purposes into a landfill site due to the relocation of a university laboratory, and the outbreak of SARS in a modern high-rise housing estate were more than just accidents, careless mistakes, or design faults. These events, upon closer analysis, involved facilities management issues that could have been avoided if attention had been paid to the concept of facilities management with a focus on coordination, as discussed above. All four cases involved "facilities" that were shared in many respects, but the common problem was one of coordination.

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Surveying & Built Environment

Hong Kong Land Policy for Bus Depot Allocation: a Valuation Analysis[1]

[2]*Lawrence W.C. Lai and Jason W.Y. Kwong

ABSTRACT

There is looming public interest in the land administration dimension of local Hong Kong transportation infrastructure redevelopment. Such interest is conditioned by the belief that franchised public bus companies were able to obtain government leasehold land parcels on favourable terms. By scrutinizing the land title documents using professional valuation techniques and available internal government documents, this paper provides further and better information for evaluating the proposition that the land parcels for depots were obtained on favourable terms from the government. This interdisciplinary paper identifies the actual sources and methods by which the franchised China Motor Bus and Kowloon Motor Bus obtained depots from the land market to develop and change their use. It also investigates if there is any evidence of government concessions in terms of land values and development permissions. The findings refute the conspiracy theory that there are such concessions. The case of the franchised public bus companies in Hong Kong should be of wider academic interest not only because, unlike counterparts in many parts of the world, they have been making a profit without direct government subsidies. This not only sheds light on whether or not there was any implicit assistance informed by the corollary of the Coase Theorem, but also on the conditions for public bus and other public transport modes to be able to provide viable alternatives to private transport.

KEYWORDS

Corollary of the Coase Theorem, bus depots, valuation, comparables, private treaty grant

[1] The broad neo-institutional economic theoretical setting is provided in Lai, Davies and Cheung (2011). For an econometric inquiry, see Lai, Chau and Cheung (2012).

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INTRODUCTION

Consider this criticism of the land administration of lease modifications in Land and the Ruling Class in Hong Kong:

> Through the workings of the lease modification system, developer conglomerates that acquired utility or public service companies have been able to exploit land assets in those companies. Idled utility sites or public bus depots have been converted into lucrative residential or commercial properties via using that system. This brings out the question of social justice and efficient use of land, the single most valuable natural resource that Hong Kong possesses (Poon 2005: p.111).

The phenomenon of big consortia with a major real estate development wing taking over public utilities (such as shipbuilding and repair; power generation, gas supply, trams, ferries, and buses) and converting sites originally used as depots or plants into property developments for private residential, commercial, and office use has been criticized in such works as Land and the Ruling Class in Hong Kong (Poon 2005) for being socially harmful. The critics tend to subscribe to a conspiracy theory of collusion between the government and business interests and have argued that these consortia have no real interest in providing public utility services save for their land resources as a land bank for real estate redevelopment at the right time.

Regarding franchised public bus transport, which has been Hong Kong's predominant mode of public transportation (by 2009, franchised buses still claimed 33% of internal transport trips as did heavy railways), Kowloon Motor Bus (KMB); New World First Bus (NWFB) (and its predecessor, the China Motor Bus (CMB), which lost its franchised routes on 1 September 1998); and CityBus (CTB) are all owned either by developers or have a strategic partnership with a developer. The "conspiracy" has been characterized as one in which the holding company or business partner of the franchised bus operator, itself a legally protected monopoly with guaranteed profits under the Profit Control Scheme, can obtain great concessions in the lease modification process, which allowed it to acquire cheaper development rights to convert land to higher value uses than to openly compete for land in public land auctions to secure leasehold interests on plots of land. This has marginalized smaller developers that lack land banks.

It is true that several bus depots have actually been redeveloped by way of lease modifications: three CMB depots in North Point and four KMB depots (in Kwun Tong; Nathan Road; Lai Chi Kok, and Yuen Long). Consider the criticism in Land and the Ruling Class in Hong Kong of the system of lease modification:

> The modification premium would be a negotiated amount and would not reflect the "contest" value as would be present in a public auction…the

> utility or public service lands were granted for a public purpose, which raises the question as to whether the operator should be entitled to turn those lands into private use in the first place (Poon 2005: p.111).

The factual question in this context is if there were any true concessions in the lease modification process by the Lands Department when it permitted these depots to be used for non-industrial purposes. A related and more fundamental question is whether such concessions formed part of an implicit consideration when the original bus franchises were granted.

RESEARCH AND SOCIAL BACKGROUND: CONCESSIONS AS PART OF THE IMPLICIT CONSIDERATIONS FOR WORSENING FRANCHISED MONOPOLY?

There is a body of international literature that has generally praised the Hong Kong economy as a successful case of laissez faire – a characterization that was seriously disputed by Poon (2005) and questioned by the late Nobel Laureate in Economic Science, Milton Friedman (2006), shortly before he passed away – and its bus market as among the most open in the world (Hibbs 1985, 1986). Besides, overseas observers (for instance, Rowlands 2009) generally found the local bus industry to be admirably profitable without the need for direct government subsidies and excellent in terms of service quality.

Interestingly, there has never been any suggestion by critics that the bus franchises, which have, since 1933, always been granted on a geographical or bundled route basis to private firms, be nationalized or replaced by a public corporation, as in the case of London Transport, or "liberalized" into an unprotected competitive market with a lot more operators, as is the case in Britain today. They simply want them to keep fares low and run more buses on all the routes allocated. However, they are now also keeping an eye on how the land holdings of public utilities are transformed into real estate developments, a process which has also happened to British bus garages. The story of the famous London Transport Bus Overhaul Works at Aldenham (Aldenham Works)[3], opened in 1956, is a case in point.

The idea of the government granting concessions in leasehold land interests, as part of an implicit consideration as a quid pro quo for the loss of the full protection of franchise interests, arose from the observation that over the years, the government's safeguards against competition for franchised bus companies (originally KMB and CMB) that initially enjoyed a geographical franchise from 1933[4] (KMB on the Kowloon Peninsula and outlying islands

[3] See DVD British Buses: the Golden Years. Home Entertainment 2004.
[4] See Figure 4 for mapping details.

and CMB on Hong Kong Island) have been successively attenuated by the legalization of "public light buses" (PLB) in 1969 (Leeds 1986: p.44); the introduction of franchised maxicabs ("green minibuses") and later non-franchised buses/coaches operating under "passenger service licences" (PSLs)[5] under Section 4(3) of the Public Bus Services Ordinance (Chapter 230, Laws of Hong Kong); and the ever expanding, government-owned, cross-harbour mass transit railway network (MTR), which recently absorbed the Kowloon Canton Railway (KCR). The most persuasive evidence of the deterioration of each bus company's full monopoly position is the formal shift from geographical franchising to route-based franchising, and the official proclamation in the White Paper on Internal Transport Policy of 1979. This ensued from the Comprehensive Transport Study (CTS) commissioned in 1973. It stated that public rail transit would be the dominant mode of public land transportation and that as a result planned development would focus on mass transit stations.

The "route franchise" system fell below 100% protection of a franchisee because the routes were opened to competition from other franchisees, PLBs, maxicabs, and PLS buses/coaches. These could operate rival routes that ran parallel to, overlapped, bypassed, crossed and re-crossed, or went beyond the franchised lines. The route franchise only safeguarded the franchisee from incursion into its assigned terminals and stops. The original geographical protection was like a blanket that ousted competitors, whereas the route franchise system was a number of protected dots, outside which competitors under PSLs could run bus services.

Theoretically, the concept of implicit consideration is derived from the theory of implicit contract. This was first developed in labour economics to explain why employers do not reduce wages when there is a slump. Neo-institutional economists have found "implicit institutions" and "implicit relation contracts," or "implicit contracts,"[6] to be significant phenomena in economics (see, for instance, Kasper and Streit 2001: pp. 99-100, 207). While such institutions and contracts are generally conceived within organizations, it is possible to expand the underlying concept to cover relations between contracting parties,

[5] A PSL can be issued for a great variety of services, namely "a tour service," "an international service," "an hotel service," "a student service," "a resident's service," "a multiple transport service," and "a contract hire service" (Transport Department 2012). There is an element of "co-competition" in that franchised competitors provide essential new market information to the franchised bus companies about the potential of new franchised routes (Lai 2004) and franchised companies obtain PSLs to operate some non-franchised public bus routes.

[6] The term, implicit contract, is not used to avoid entangling the analysis, which is qualitative, with high mathematical exposition in the literature of implicit contract. A contract must have "consideration," but not vice versa. The concept, implicit consideration, advanced here can be said to be "Coasian" in the sense that it is a means of reducing the transaction costs to better fulfill an existing contract – the explicit franchise agreement.

as in the case of labour economics or franchise agreements, the subject matter of this paper. The benefits of such contracts are not legally enforceable, as there is no explicit oral or written promise or law stating that they must be, but they are experienced by parties to a contract to the extent that if such benefits are discontinued, then a party may seriously reconsider if it wants to renew the contract.

The idea of an implicit contract has been subsequently adopted by public economists to deal with the practical issue of compensating regulated utility companies for sunken investment costs lost when their markets are opened by the government. It has been argued that under the circumstances, there is an implicit contract such that compensation is warranted (Boyd 1998). This paper seeks to transfer the theory of implicit contract to public bus franchising under the terminology of implicit considerations.

The Hong Kong Government enforces bus franchises for its franchisees while, at the same time, principally prosecuting operators of unauthorized private bus services and other types of authorized bus services that pick up or drop off passengers in franchised bus stop zones. What are the implicit benefits besides such an explicit form of contractual protection?

A good example of the implicit benefits granted to franchisees would be evidence of immunity from prosecution if a bus carried too many passengers; was not parked within an authorized bus park zone, or emitted too much smoke. Such a favour would never been granted to taxis or non-franchised red maxicabs.

Another good example of a benefit conferred under an implicit contract, which was discovered by Lai, Davies, and Cheung (2010), is that the franchisor, the state, would "automatically" reserve land, as well as plan for and build bus terminals in major catchments for passengers (i.e., at both ends of the franchised routes). Theoretically, there is no need for such terminals, and the bus can simply stop at kerbside bus stops where there is a need to let off and/or pick up passengers. Practically, a terminal allows for better bus scheduling, cleaning, and re-servicing, as well as offering a rest area for drivers.

This paper seeks to cover three basic areas of public policy and theoretical concern rarely jointly considered in the literature on the geography of public transport (**Figure 1**), namely legally created or franchised monopolies, land administration of a leasehold system, and planning controls. The first concern is economics, and it involves such policy issues as the proper regulation of public utilities that are legally protected; privatization (proponents of which rely on the findings of constant returns to scale); efficient pricing for deceasing costs or natural monopolies by Nobel laureate Ronald H Coase (Coase 1946); and theoretical issues such as the genesis of the government-protected monopolies (Coase 1959; Lai and Yu 2002) and their efficient pricing (Lai et al 2008a, 2008b).

The second theoretical concern is the question of the lease modifications of leasehold interests controlled by the government. Hong Kong has practiced a leasehold land regime since it was colonized in 1841, and this, together with statutory zoning plans, forms a peculiar dual system of development control (Lai 1998, 2010). While the issue in focus is surely of great local political interest, as indicated by a recent query by a Legislative Councillor who questioned bus depot allocation policies (Hong Kong Special Administrative Region Government 2011), it has ceased to be a parochial Hong Kong matter since China adopted the equivalent system for its "land use rights" reforms in 1993 (Lai 1995). Above all, according to the corollary of the Coase Theorem, variation in institutional arrangements (in our case ways of allocating government leasehold land interests) would affect efficiency in the use of resources. Therefore, this study is a contribution to Coasian economics.

The third concern is the operation of the statutory planning system in rationing redevelopment rights, which, in the case of Hong Kong, means an additional hurdle to redevelopment according to the Crown/Government Leases.

The looming criticism of developers in relation to the use of land assets of bus operators should not be taken in isolation but interpreted, from a public policy development point of view, in the wider constitutional context of post-colonial Hong Kong. This has witnessed "rising public mistrust of the government and intensifying grassroots grievances" (Lau and Kuan 2000: p.1024). It is hoped that this paper will provide the public and policymakers with a better-informed picture of a key dimension of everyday life in Hong Kong – bus transportation – as well as its real estate implications.

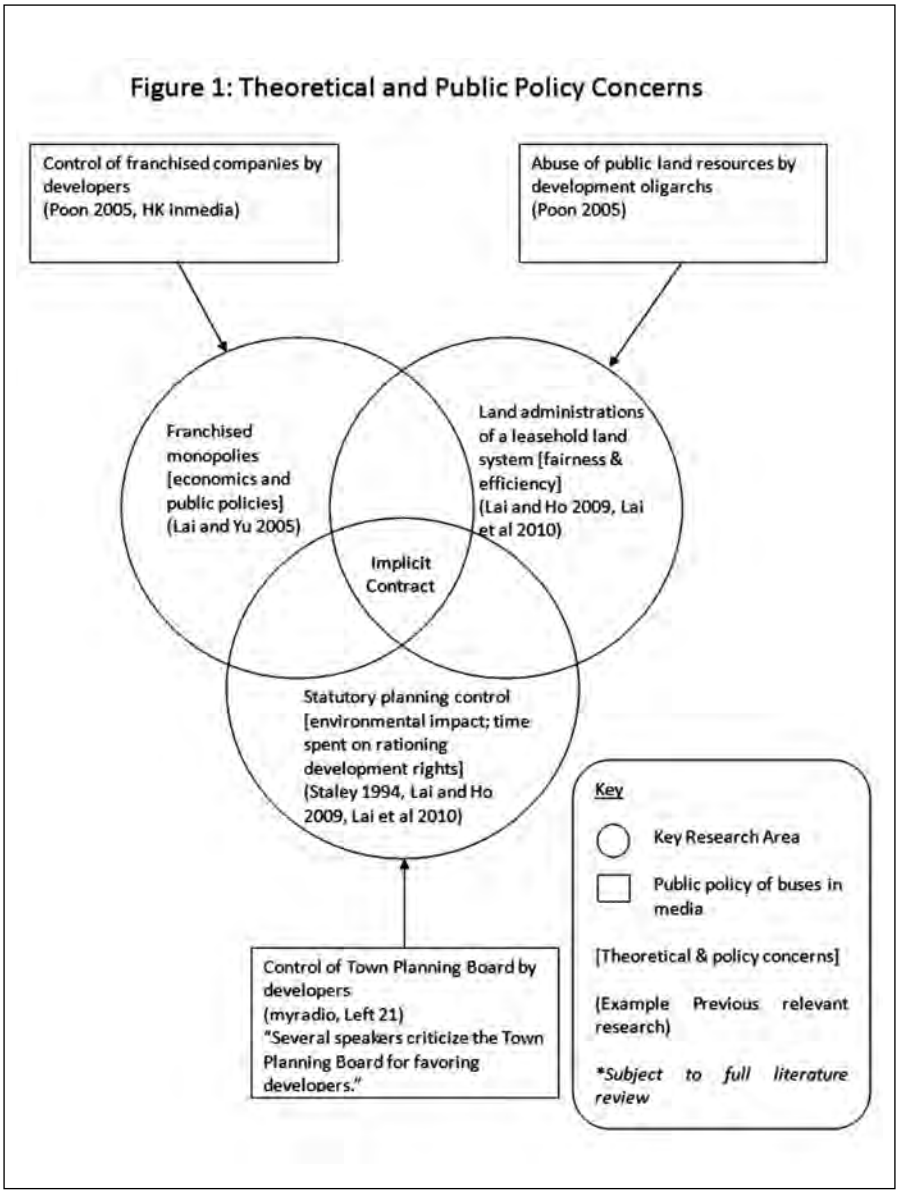


Figure 1: Theoretical and Public Policy Concerns
Control of franchised companies by developers
(Poon 2005, HK inmedia)
Abuse of public land resources by development oligarchs
(Poon 2005)
Franchised monopolies [economics and public policies]
(Lai and Yu 2005)
Land administrations of a leasehold land system [fairness & efficiency]
(Lai and Ho 2009, Lai et al 2010)
Implicit Contract
Statutory planning control [environmental impact; time spent on rationing development rights]
(Staley 1994, Lai and Ho 2009, Lai et al 2010)
Control of Town Planning Board by developers
(myradio, Left 21)
"Several speakers criticize the Town Planning Board for favoring developers."
Key
Key Research Area
Public policy of buses in media
[Theoretical & policy concerns]
(Example Previous relevant research)
*Subject to full literature review

Figure 1

The local public policy significance of this paper should be viewed in light of public opinion coloured by a sentiment highly critical of developers as anti-social oligarchs controlling the economy and helping to drive up property prices. Following a press conference in 2008, the public policy research project[7] on planning conditions for the development of public facilities and open spaces in private developments (Lai 2009; Lai et al 2007; 2009) unintentionally added to the media literature on certain business practices of developers. It so happens that these developers are also members of consortia that hold key public utility franchises (with land assets for plants) protected by the government under legislation and franchise conditions. Several opinion groups (such as "Myradio" and "Left 21") have criticized the Town Planning Board for favouring large developers. Their views were certainly conjectural, but there is a need to rigorously investigate how this relates to bus depots.

The idea unifying these concerns is the notion of an implicit consideration taken on a quid pro quo basis by the franchisor/government in return for a franchisee's services in uncertain market conditions. The difficulty of this concept is what actually constitutes implicitness. If a condition is an express term of a contract or lease then it is definitely not implicit, but explicit. The question is whether something observable can be treated as a condition of an implicit contract or a merely accidental fact. It is possible, however, to eliminate here anything that is indeed part of an applicable contract and anything for which there is no evidence of it bearing any relation to the maintenance of a franchise agreement.

However, the better answer to this question is that the purpose of using the idea of an implicit consideration is a convenient way (there are surely other ways) of analysing criticism of the existing land administrative practice. Seeking to verify the existence of an implicit consideration by looking into the terms of applicable contractual documents is a way of evaluating the practice. For if the reality was that the concessions were actually contractual, then the focus of the public should not be on land policy, but on public utility franchising. If the concessions turn out to be something other than the franchise conditions state, but clearly refer to the franchise agreements, then an implicit consideration is not refuted as an explanation.

METHODOLOGY

This paper basically adopts a case study approach that relies on the textual analysis of public documents, particularly franchise conditions, Crown Lease terms and Conditions of Surrender, and a Re-grant and contextual analysis of these documents. The case study approach is favoured by neo-institutional economist Coase (1959, 1974, 2000) in studying transport matters from an institutional economic

[7] PPR HKU 7023-PPR-2.

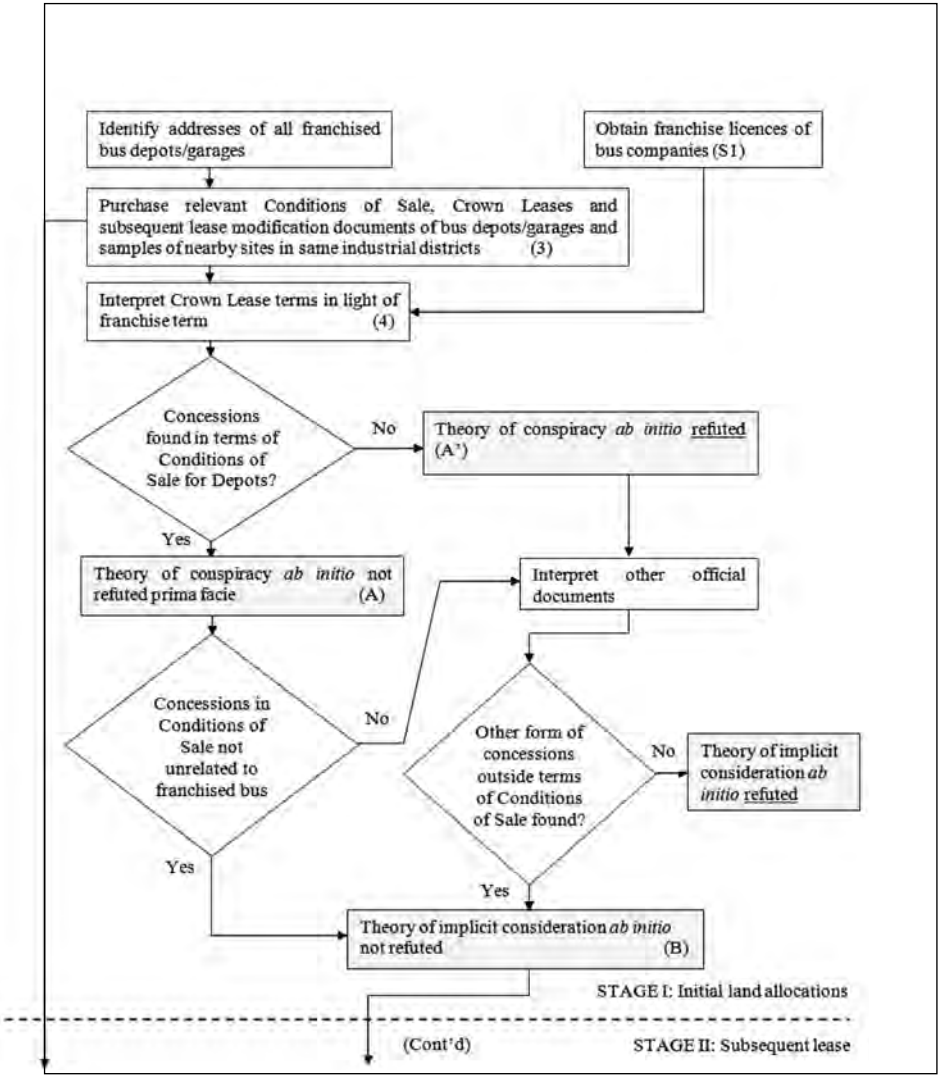
perspective. The textual and contextual interpretations require some training in law, economics, and planning. Besides, this case study is intended to engage the surveyor and hence details essential for a skeleton a valuation report are provided.

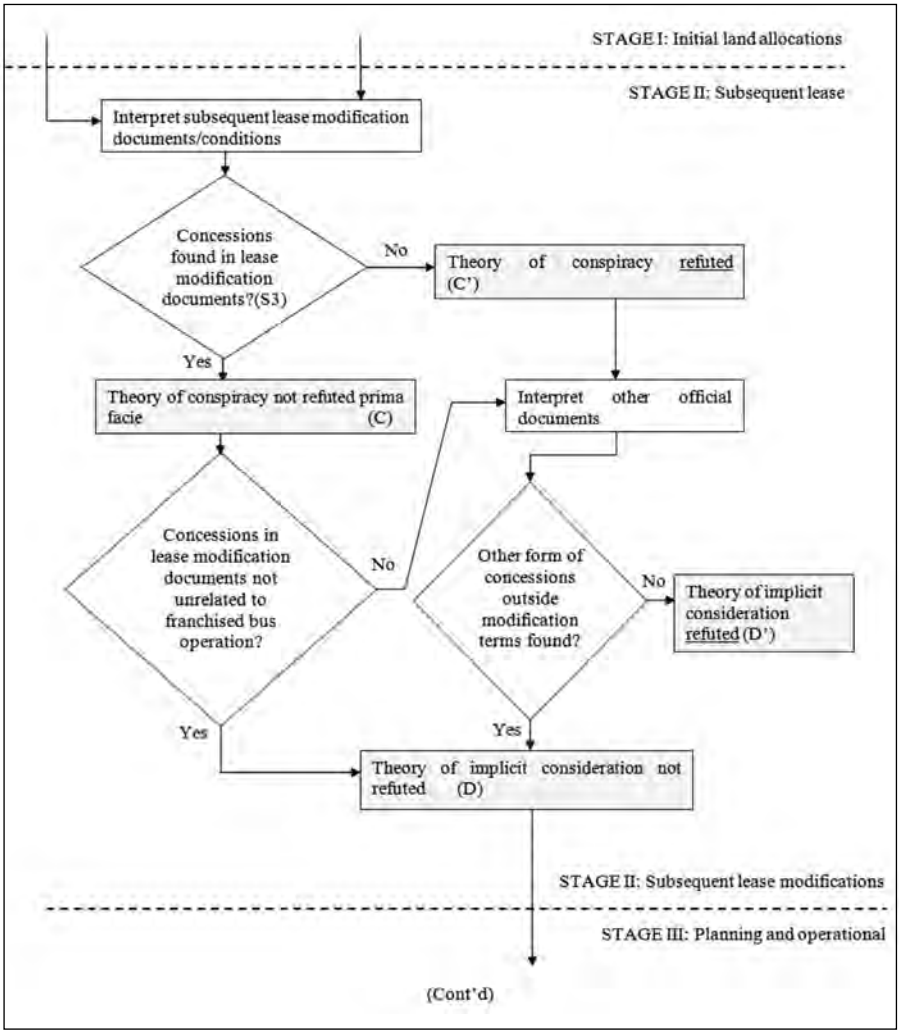
The specific objectives of this case study are to find out firstly if the conditions of the franchises of KMB and CMB from 1933 onwards provide specific requirements or concessions regarding their land acquisitions for garages, depots, and workshops. Secondly whether the terms of the Crown (Government) Leases for KMB and CMB's garages, depots, and workshops provide specific concessions regarding land acquisitions for subsequent modifications to favour other uses. Thirdly if the terms of the Conditions of Modifications/Surrender and Re-grant of the land originally for KMB and CMB's garages, depots, and workshops enjoy specific concessions in terms of premia or other conditions, compared to those of comparable sites subject to lease modifications. Lastly to find out whether planning permission for changing the use of land are easy for bus companies to obtain.

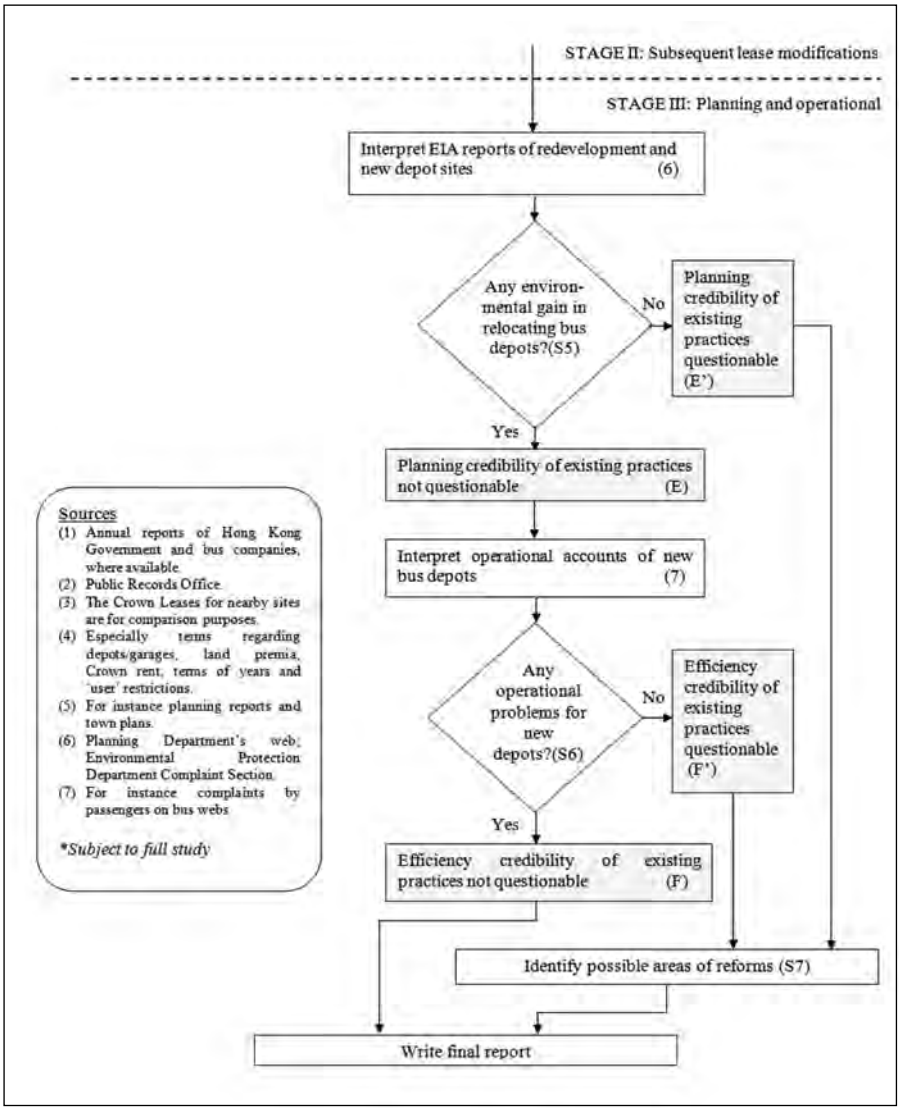
Figure 2 below shows the steps in the analysis. The specific research objectives (denoted by an S) for a comprehensive study fall into three stages of analysis. The first stage covers the original Crown Leases for the depots. The key question is whether their allocation or any of their terms represented a contractual or implicit concession to bus operators. This is the first round of verifying the existence of an implicit consideration.

The second stage covers the process of lease modification. The key question is whether such a modification in itself or any of the terms under the Conditions of Surrender and Regrant were tantamount to a contractual or implicit concession to bus operators. This is the second round of examining if any implicit consideration existed.

Figure 2: Outline research procedures




STAGE I: Initial land allocations
STAGE II: Subsequent lease
Interpret subsequent lease modification documents/conditions
Concessions found in lease modification documents?(S3)
No
Theory of conspiracy refuted (C')
Yes
Theory of conspiracy not refuted prima facie (C)
Interpret other official documents
Concessions in lease modification documents not unrelated to franchised bus operation?
No
Other form of concessions outside modification terms found?
No
Theory of implicit consideration refuted (D')
Yes
Yes
Theory of implicit consideration not refuted (D)
STAGE II: Subsequent lease modifications
STAGE III: Planning and operational
(Cont'd)


STAGE II: Subsequent lease modifications
STAGE III: Planning and operational
Interpret EIA reports of redevelopment and new depot sites (6)
Any environ-mental gain in relocating bus depots?(S5)
No
Planning credibility of existing practices questionable (E')
Yes
Planning credibility of existing practices not questionable (E)
Interpret operational accounts of new bus depots (7)
Any operational problems for new depots?(S6)
No
Efficiency credibility of existing practices questionable (F')
Yes
Efficiency credibility of existing practices not questionable (F)
Identify possible areas of reforms (S7)
Write final report
Sources
(1) Annual reports of Hong Kong Government and bus companies, where available.
(2) Public Records Office.
(3) The Crown Leases for nearby sites are for comparison purposes.
(4) Especially terms regarding depots/garages, land premia, Crown rent, terms of years and 'user' restrictions.
(5) For instance planning reports and town plans.
(6) Planning Department's web; Environmental Protection Department Complaint Section.
(7) For instance complaints by passengers on bus webs
*Subject to full study

The final stage deals with the time involved in the planning process for and the environmental and operation consequences of redeveloping and relocating bus depots. While it goes beyond the theoretical question of implicit consideration granting, this is essential for completing a study of a major type of regulated utility from a public interest point of view.

However, due to time restrictions, this paper will be limited to addressing the first research question. However, it goes beyond the scope and depth of the work of Lai et al. (2012) in terms of valuation analysis.

The work of Lai, Davies, and Cheung (2010) partially simulated Stage 1 of **Figure 2**, which is the focus of this paper. Its key finding was that the provision of depots was actually a requirement (in other words, a burden) under franchise conditions. The franchisees had to bid in the open land market for their depot sites, and there was no obligation on the part of the government to make provision for these sites. Under Section 19 of the Public Bus Services Ordinance, the current law, introduced one day before the return of Hong Kong to China, a grantee of a franchise "shall provide and maintain such premises as the Commissioner considers necessary for construction, repair and maintenance of vehicles used by the grantee in connection with its franchise and for the parking of all such vehicles when they are not in use." This mirrors the prevailing franchise licence term requiring the bus company to obtain sites (depots) for the construction, repair, and maintenance of vehicles. However, there was evidence of implicit government support for the operation of franchise buses by way of a public provisioning of land, town planning, and the construction of bus termini in areas with heavy patronage, notably franchised ferry piers and public rental housing estates.

Yet, there was no evidence that the bus and ferry operators were favoured when they acquired the land required to build their depots or shipyards (Lai, Davies, and Cheung 2010; Sham 2007). The investigation was limited in time span and did not go beyond 1972, when the first cross-harbour tunnel began operations and broke the geographical monopolies of both bus companies by allowing each company's "tunnel buses" to invade the originally insulated domain of the other. Besides, their research was constrained by limitations in funding, which prohibited a full investigation of the relevant Crown Leases or other significant land documents, notably the Conditions of Sale and archive materials.

The general hypothesis is that the government favoured the bus companies by implicit contract. The four specific hypotheses that correspond to the four specific objectives are:

> **Hypothesis 1**: There is a provision in the franchise agreement that states that the government would grant the franchisee sites for depot use.
>
> **Hypothesis 2**: The bus depots were mainly allocated by the government to the bus companies through private treaty grants (PTGs). When

they were obtained through land auctions, competitors were limited to franchised bus operators in terms of the Conditions of Sale.

Hypothesis 3: The bus company did not need to pay any premium when the terms of the Crown Leases, which restricted use to "industrial only," were modified for other uses at any site bought from the government or acquired from another source.

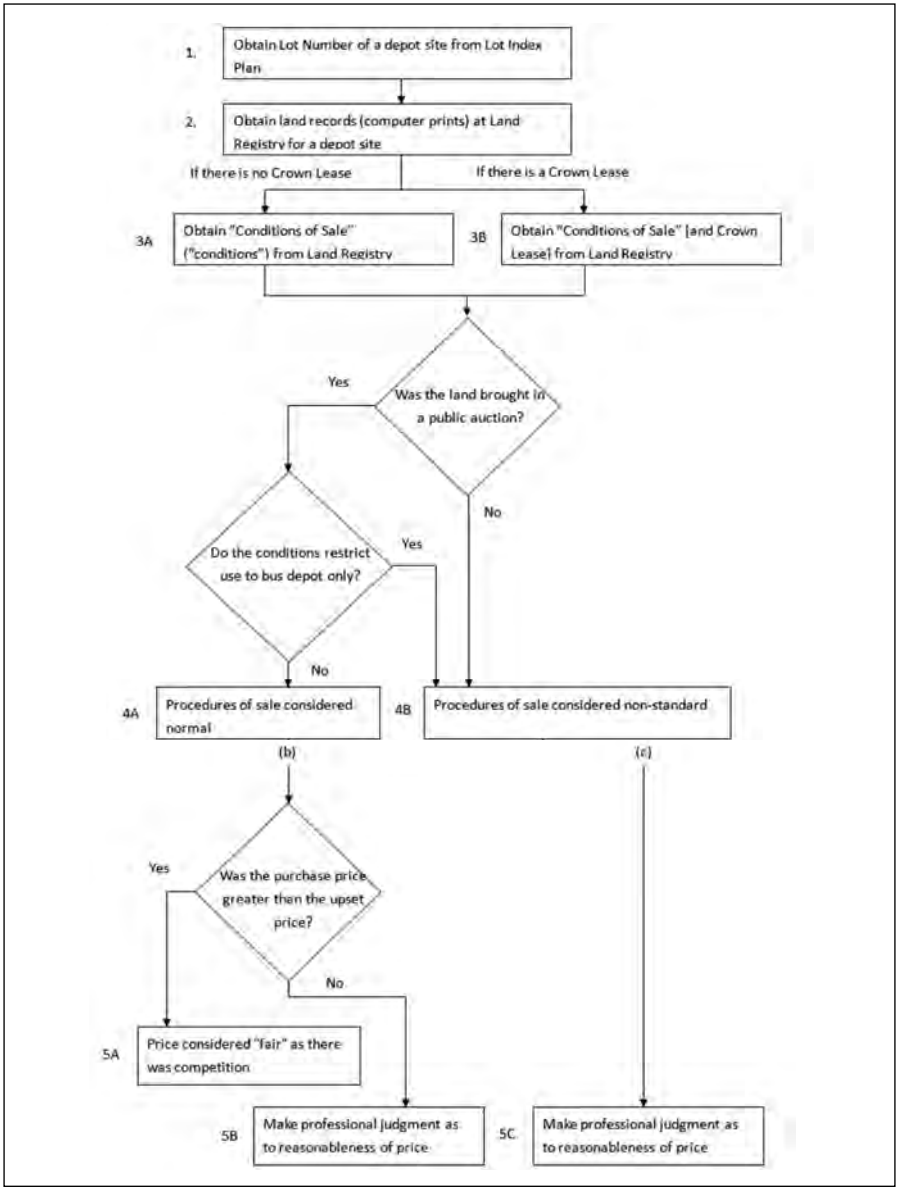
Hypothesis 4: Planning permission for a change in the use of a bus depot site, if required under the Town Planning Ordinance (Chapter 131, Laws of Hong Kong), was easily obtained by the bus company.

The first specific hypothesis was to evaluate if the availability of land to the bus companies was something undertaken by the state. It would fail if a bus company had a contractual or licensed entitlement to obtain land from the government.

The second specific hypothesis was to look into the actual mode of land acquisition by the bus company. Its structure assumed that the government would either bestow upon the bus company sites for depot use or severely restrict entry to competition if land parcels were allocated in auctions and would fail if neither condition applied.

The third specific hypothesis was to test if the government gave preferential facilitation of a change in the use of depot sites. It would be rejected if a bus company had to pay a "modification premium" commensurate with going market rates for depot land obtained from any source, as in the case of any private landowner who wishes to modify the land use restrictions in his/her land lease. The logical process of evaluating Hypotheses 2 and 3 is presented in **Figure 3**.

Figure 3: Steps taken to evaluate fairness and reasonableness of bus depot purchase prices



The last specific hypothesis was to test if the government gave preferential facilitation of a change in the use of depot sites. It would be rejected if the statutory development applications for planning permission (Lai, Ho, and Leung 2010) were always permitted in the first instance.

Corresponding to the three research objectives are four types of data that had to be obtained. Their requirements, sources, and resource implications are stated in **Table 1** below:

Table 1: Data requirements and Sources

Data required (Specific Objective)	**Data Sources**
(S1) The conditions of franchise for KMB and CMB	Public Records Office, Government of the Hong Kong Special Administrative Region (Government of the HKSAR); Transport Department
(S2) The terms of the Conditions of Sale, Crown (Government) Leases and Private Treaty Grants for KMB and CMB's garages, depots, and workshops	(a) Addresses from the annual reports of each bus company, telephone directories, specialist books on Hong Kong buses or the government's Annual Reports; (b) Lot Numbers shown in Lot Index Plans kept in the Lands Department's; (c) Land transaction records, Crown Leases and Conditions of Sale/Private Treaty Grants kept in the Lands Registry; and (d) Old Conditions of Sale not kept in Land Registry but in Public Records Office
(S3) The Terms of Conditions of the Modifications or the Surrender and Re-grant of the land originally for KMB and CMB's garages, depots and workshops	Land transaction records, Conditions of the Modifications or the Surrender and Re-grant kept in the Lands Registry
(S4) The planning permissions for change in use of bus depot sites	Planning Department's website for planning application statistics

In the drafting of this paper, scholars and experts in the field of bus transport operation, franchising and regulation and land administration were consulted. In the study, a bus depot is defined as a permanent site with building(s) and facilities to inspect, clean, fabricate, repair, and maintain buses. Sites obtained from the government that lacked major building works for parking under short term tenancy were not considered, as no exhaustive official record of such during the entire study period was maintained or found.

FINDINGS AND INTERPRETATIONS

The first major discovery was that no franchise agreement provided a government guarantee that Crown land would be made available to the franchisee for use as a garage or depot. On the contrary, the bus company had a duty to maintain its own garages. **Hypothesis 1** was therefore refuted. The finding of Lai, Davies, and Lorne (2011) was affirmed.

The second fact established was that there were three ways a bus company could obtain land for bus depot use. The first method was to purchase sites in the second-hand land market from another private landowner. KMB's depots in Lai Chi Kok (New Kowloon Marine Lot 3) and Kwai Chung (Kwai Chung Town Lot 215), both having been redeveloped for non-depot uses, were obtained this way. The seller of the first depot was Dairy Farm; the sellers of the latter were owners of agricultural (Demarcation District) lots in Yuen Long. The second method was to obtain land from the government through public auctions. This method was established as early as 1928, before KMB or CMB obtained their geographical franchises, when KMB won the bid for its depot in Mong Kok (Kowloon Inland Lot 2111). This method was formally affirmed in 1958 when the Colonial Secretariat turned down a request by KMB to obtain land through a grant from the New Territories Administration (Lai, Davies, and Cheung 2011), and was replaced in 1979, four years after geographical monopolies were formally superseded by route franchising.

The second method was initiated by a bus company, which proposed to buy a site under Crown ownership through a legal representative. The government then valued the land and determined an "upset price" for an auction, chose a date for a public auction, drafted a set of "Conditions of Sale," and auctioned the land publicly on the appointed date. The bus company could only obtain the site in question if it was the highest bidder. Bidding could be in cash or Letters A/B issued by the government in exchange for land held by indigenous villages (Nissim 1998). Our research identified 16 depot sites obtained from public land auctions. Two of these, Mong Kok (Kowloon Inland Lot 2111) and Camp Street (New Kowloon Inland Lot 2622), were purchased before World War II, while the Kwai Chung site (Kwai Chung Town Lot 215) was obtained using Letters A/B. KMB's Yuen Long depot (DD120 Lot 3543) was purchased from private landowners. **Photo 1** shows the three bus depots in North Point obtained by CMB.

Photo 1 Bus Depots North Point Marked

The third method, currently still in use, was for the bus company to obtain land through PTG. In our study, only two permanent KMB depots were obtained this way – namely the depots in Tuen Mun (Tuen Mun Town Lot 82) and Kowloon Bay (New Kowloon Inland Lot 5801). This last method was first adopted in 1979 by the government to allocate the Tuen Mun Town Lot 82 to KMB. This happened four years after the formal dissolution of the geographical franchises in 1975 by a new Public Omnibus (later Public Bus) Services Ordinance (Chapter 230, Laws of Hong Kong). The key findings on the locations of bus depots, price considerations paid by the bus companies, and present land uses are presented according to the method of their acquisition: government auction, the second-hand market, and PTG, in **Tables 2a, b, and c**, respectively.

Table 2a: Depot sites sold by government to bus companies in public auctions

	Location (bus company)	Lot No	Method of allocation by government	Purchase price [Upset price]	Current property [Redevelopment method]	Premium of lease modification or exchange
1	Chai Wan (CMB)	CWIL 88 (Ex-CWIL 33)	Sale by public auction in 1965	$1,435,000 [$1,435,000]	Bus depot/car park	NA
2	North Point (CMB)	IL 7550	Sale by public auction in 1958	$800,000 [$800,000]	625 King's Road (office building) [Modification Letter in 1997]	$430,350,000
3	North Point (CMB)	IL 5532	Sale by public auction in 1939	$63,400 [$63,400]	Island Place IL 8849 [Land Exchange (C/E NO.12353) in 1995]	$887,000,000
4	North Point (CMB)	IL 7178	Sale by public auction in 1954	$811,000 [$728,000]		
5	Wong Chuk Hang (CMB)	AIL 338	Sale by public auction in 1969	$650,000 [$650,000]	Vacant	NA

6	Wong Chuk Hang (CMB)	AIL 339	Sale by public auction in 1970	$1,060,000 [$620,000]	Vacant	NA
7	Kwun Tong (KMB)	KTIL 192	Sale by public auction in 1961	$3,710,000 [$3,060,000]	Millennium City 1 KTIL 733 [Land Exchange (C/E NO.12421) in 1996]	$464,000,000
8	Kwun Tong (KMB)	KTIL 240	Sale by public auction in 1961	$3,623,000 [$3,350,000]	Vacant	NA
9	Mong Kok (KMB)	KIL 2111	Sale by public auction in 1928	$92,300 [$92,300]	Pioneer Centre [No need modification nor exchange]	NA
10	To Kwa Wan (KMB)	KIL 6393	Sale by public auction in 1953	$651,000 [$360,000]	Merit Industrial Centre [No need modification nor exchange]	NA
11	Camp Street, Sham Shui Po (KMB)	NKIL 2622	Unknown due to war time loss of conditions of sale/grant, likely public auction	Unknown	Manor Centre and Petrol Filling Station [No need modification nor exchange]	NA

12	Shun Ning Road, Sham Shui Po (KMB)	NKIL 3602	Sale by public auction in 1950	$257,400 [$257,400]	Merlin Centre and Park [No need modification nor exchange]	NA
13	Tau Lin Pei Road, Kwai Chung (KMB)	KCTL 215	Sale for Letters B in 1971	NA	Kowloon Commence Centre [Modification Letter in 1996]	$186,550,000
14	Shatin (KMB)	STTL 241	Sale by public auction in 1984	$36,400,000 [No data]	Bus Depot	NA
15	Tuen Mun (KMB)	TMTL 80	Sale by public auction in 1974	$5,810,000 [$5,000,000]	Bus Depot	NA
16	Tuen Mun (KMB)	TMTL 81	Sale by public auction in 1974	$8,530,000 [$7,000,000]	Bus Depot	NA

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Table 2b: Depot sites sold by private individuals to bus companies

	Location (bus company)	Lot No	Method of acquisition by bus companies (Year)	Purchase price	Current property [Redevelopment method]	Premium of lease modification or exchange paid
1	Lai Chi Kok (KMB)	NKML 3	Privately acquired from Dairy Farm (1955)	No Data	Manhattan Hill [No need for modification nor exchange]	NA
2	Yuen Long (KMB)	DD120 Lot 3543	DD lots, acquired from other owners (1960?)	No Data	Yuen Long Plaza YLTL 449 [Land Exchange (New Grant 3595) in 1989]	$13,300,000

Table 2c: Depot sites granted by government to bus companies

	Location (bus company)	Lot No	Method of allocation by government (Year)	Purchase price	Current property [Redevelopment method]	Premium of lease modification or exchange paid?
1	Kowloon Bay (KMB)	NKIL 5801	Allocation by grant – tied in with franchise terms (1986)	$62,000,000	Bus depot	NA
2	Tuen Mun (KMB)	TMTL 82	Allocation by grant – tied in with franchise terms (1979)	$5,274,000	Bus depot	NA

The bus depots identified were plotted on a recent map of Hong Kong in **Figure 4**, which demarcates the de jure and de facto geographical franchise zones of the two bus companies from 1933 to 1972.

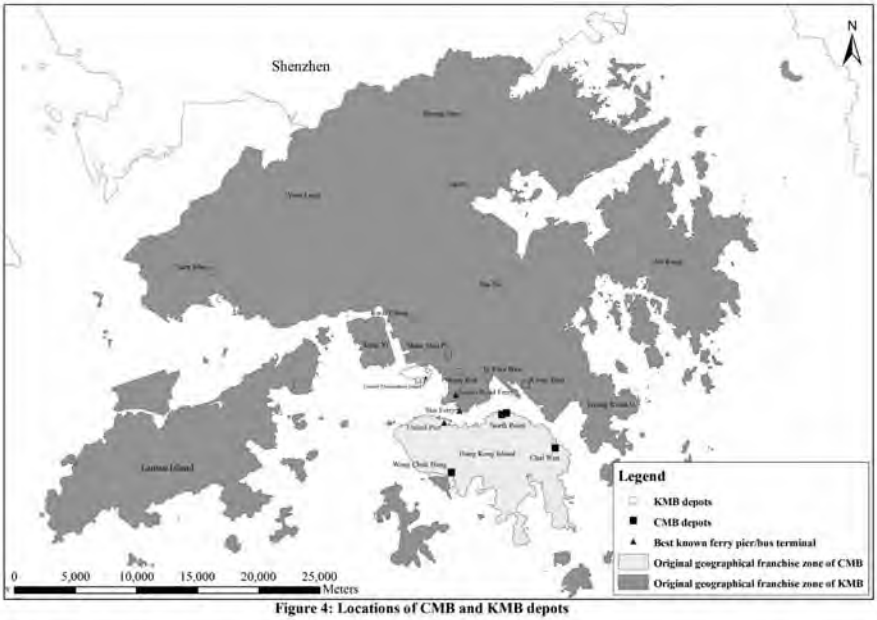

Figure 4: Locations of CMB and KMB depots

The third finding was that there was no evidence of any post-war government preferential treatment in any of the methods of depot acquisition.

A total of 16 sites were bought from the government by both bus companies for depot use. The key data for the valuation of four of them (Items 9, 11, 13, and 14 in Table 1) could not be found, even after we had exhausted our search of PRO records, due to the loss of official files or the use of Letters A/B in the land transactions. Each of the remaining 12 depots was obtained through a public land auction, and hence, there was open and fair competition for them. Indeed, the actual transaction prices were greater than the upset prices in seven out of the 16 sites examined. They were the To Kwa Wan depot (Kowloon Inland Lot 6393), which KMB bought in 1953; the North Point depot (Inland Lot 7178), which CMB bought in 1954; the two Kwun Tong depots (Kwun Tong Inland Lots 192 and 240), which KMB bought in 1961; the Wong Chuk Hang depot (Aberdeen Inland Lot 339), which CMB bought in 1970; and two of the three Tuen Mun depots (Tuen Mun Town Lots 80 and 81), which KMB bought in 1974. This means that the bus companies had to compete with other commercial or industrial operators for land and no taxpayers' subsidies were involved. The upset prices of the other five sites bought through

public auctions were also considered reasonable after taking into account "comparables" in neighbouring or similar industrial sites.

The comparables were selected and the conditions of sale obtained and examined. The opinion of a chartered estate surveyor was that for each depot, the upset price was at the market level. The "comparables" were selected primarily on the basis of geographical characteristics from land parcels on the same street block or locality, which were, more or less, of the same size and characteristics as those of the bus depot on the same street block or area. These parcels were then screened along with those for which the conditions of sale imposed the same type of land use and development restrictions AND were bought at a time closest to the time of the purchase of a comparable bus depot being retained. Then the per-metre value of the bus depot was compared to those of its comparables. When no comparable could be found in the same locality, land parcels in districts subject to the same land use restrictions sold at around the same time were chosen as comparables. In our study, the land values of five sites (Items 1, 2, 3, 5 and 12 in **Table 1**) sold at upset prices were found to be at market levels.[8]

After examining the post-war sites auctioned and obtained by the bus companies, their conditions of sale, and their subsequently issued Crown Leases, we found no restriction of use for only franchised bus operators, but rather general industrial uses. This affirmed that there was no artificial restriction on the status of potential competitors to limit competition to CMB and KMB. Apparently, when KMB applied to obtain a bus depot in 1958 by using the third method, it had experienced strong competition for the To Kwa Wan depot and known about the allure of the North Point depot (Inland Lot 7178) during an era in which Hong Kong worked hard to gain an international reputation as an export-led manufacturing economy. The government, however, upheld the public land sale method until 1979 before switching to PTG. The PTG, unlike what some members of the public might think, was, according to our analysis, not a gift because not only was the bus company required to and did pay an assessed land premium[9] but also because the terms of the land were tied in with the terms of the franchise, so that the land would revert to the government as soon as the bus companies lost their route franchises. Section 6, "Grants by Private Treaty" in the restricted Land Administration Policy of the Hong Kong Government (1986), which was prescribed from as early as 1982 until mid-1986 for sites that would house public utilities, had to be valued at full market rates.

[8] The "comparables" for five sites were, respectively: (1) KIL 9174 & 9175; (2) IL 7178, IL 7666, IL 7359, IL 7860, IL 7733, IL 7732, IL 6895SA, IL 6876, and KTIL 192; (3) IL 6155, NKILs 2622, 2621 & 2623 NKML 3, & NKPIER No. 8; (5) AIL 340, AIL 341, AIL 342, AIL 343, AIL 344; and (12) KIL 6393, IL 7069, KIL 6053, KIL 6088, IL 6895.

[9] Based on the "comparables" obtained in the same way as those for auction sites, it was judged that the premia of the sites were a discount of the market values of those comparable sites free of encumbrances.

"Sites might be granted to public utility companies for the utility purposes covered by the franchise subject to the company undertaking not to dispose of any land granted by Government or acquired on the open market and already used for such purposes without Government's permission" (Para 28: Hong Kong Government 1986: 17).[10] However, the same document also stated that CMB had refused to grant the undertaking and KMB's undertaking was no longer valid. Also, future PTGs to KMB required the "Executive Council's approval" (Para 28: Hong Kong Government 1986: 18). Pending further and better research on the evolution of this policy beyond the resources of the authors, we believe that the government has always been keen to ensure that there was a clear policy intent of not permitting concessions to franchised bus companies in the form of land grants. Any allegation of a conspiracy must be viewed in light of this clear policy.

Based on the above observations, **Hypothesis 2** is refuted. From 1928, before the creation of a franchised bus law, to 1979, well after the de facto breakdown of each bus company's geographical franchise, the government did not grant any more land to either bus company. Instead, it sold land in public auctions in which contenders often bid up land prices, and there was an incentive for the bus companies to press the government to limit competition. But the government stood firm. Therefore, there is no case to make that there was government preferential treatment or concessions to the bus companies prior to 1979. When the government adopted the new policy of PTG in 1979 – 21 years after KMB attempted to persuade it to do so – the terms of grant stipulated that the land would revert to the state when the company lost its franchise.[11] In the same vein of the concept of implicit contract articulated by Lai, Davies, and Cheung (2011), we considered the mechanism of a grant as a possible quid pro quo to the bus companies to compensate for losing their geographical monopolies. The route franchising system is, upon closer analysis, too open to competition by PLBs, which, as mentioned, emerged in the late 1960s illegally and were regulated by the 1970s. However, the greatest rival to the public bus is the Mass Transit Railway, which came into

[10] "Department of Building and Lands file reference" (16) & (40)1 in BLD 1/1307/82 II. The date of the policy for "Full Market Value Grants" was stated to be "1.6.1986".

[11] As for the PTG for Tuen Mun (TMTL 82), the three comparables in Kwai Chung (KCTL 264, KCTL 267, and KCTL 258) indicated that in 1973, the accommodation value (AV) of a car park site was about 38% of the industrial site. It was visualized that the ratio would be lower had the car park been confined to accommodating cars without car repair facilities. A comparison of the subject land and the comparables in Tuen Mun indicated that the AV of the bus depot site was about 18% of the industrial site. Taking into consideration the differential between the business of parking private cars and buses, the timing factor, the location of the depot, and the industrial land and land grant being conditional upon the licencing of the omnibus services, the premium paid for the subject lot should represent the prevailing market value. As for the PTG for Kowloon Bay (NKIL 5801), the corresponding percentages of the AV discount were 38% and 44.77% based on comparables NKIL 6306, KCTL 264, KCTL 267, and KCTL 258.

the scene from 1979.

The third finding, as shown in the last column of **Table 2a**,[12] was that the bus companies had to pay substantial lease modification premia to change the user restrictions. A total of six depots were redeveloped after lease modifications and/or land exchange. These included CMB's three depots along or near Kings Road in North Point (Inland Lots 7550, 5532, and 7178), one of KMB's Kwun Tong depots (Kwun Tong Inland Lot 192), KMB's Kwai Chung depot (Kwai Chung Town Lot 215), and KMB's Yuen Long depot (DD120 Lot 3543). None of these sites was obtained by way of a PTG and all were either bought from the government through auctions or from private owners. Comparables were considered, and the premium was not considered unreasonable. **Hypothesis 3** is, therefore, refuted.

The fourth discovery was that there was no sign of a universal grant of immediate planning permissions for planning applications for a change in use. Not all of the six planning applications by CMB and KMB were instantly approved.

Immediate planning permissions were granted to KMB's Kwun Tong depot (Kwun Tong Inland Lot 192) for each of the four rounds of applications (first round with Kwun Tong Inland Lot 240) in April 1992, September 1994, November 1994, January 1997, and February 1998; KMB's Kwai Chung depot (Kwai Chung Town Lot 215) in May 1994; CMB's North Point depot (Inland Lot 8849, re-granted upon the surrender of Lots 5532 and 7178) in December 1995; and King's Road (Inland Lot 7550), which was earlier approved in the first instance in two rounds (March 1994 and December 1995). The second round of planning applications for the Kwai Chung depot, however, failed. Three other cases suffered initial and even subsequent rejection. The planning application for CMB's North Point depots (Inland Lots 5532 and 7178) succeeded during its review application in September 1992. But KMB's Lai Chi Kwok depot's (NKML3) third, fourth, fifth, and sixth rounds of application (in February 1998, August 2000, July 2001, and February 2002) were all approved in the first instance after two previous unsuccessful applications and reviews (in July 1996 and December 1995).

Therefore, **Hypothesis 4** is refuted. However, while one could not say that these few applications were exceptionally difficult to approve (and in any event, the conversion of an industrial use into a non-industrial use should not have been too controversial on environmental planning grounds), one may still say that it was relatively easy for KMB and especially CMB to get through the planning system, despite what Lai and Ho (2009) found. The easier CMB land conversion, however, could not reasonably be argued to be an anticipatory compensation for her loss of 36 lucrative routes in 1993 on a

[12] All dollars are in Hong Kong Dollars (HKD). (1 USD = 7.8 HKD).

close analysis of the institutional design of the Town Planning Board. Transport Department was only one voice in the Town Planning Board, an independent statutory body subject to strong influence by Planning Department.

Table 3: Time taken for obtaining planning permissions for change in use of bus depots

Depot (Bus company)	Date first planning application made	Date final planning permission granted	Time taken (Number of years) to obtain final planning permission from date of first application (About)
North Point (CMB) [Inland Lot 7550]	22/5/1992	15/12/1995	3 years
Lai Chi Kwok (KMB)	4/11/1994	11/2/2002	7 years
Kwun Tong (KMB) [Kwun Tong Inland Lot 192]	20/3/1992	6/2/1998	6 years
Kwai Chung (KMB)	5/11/1993	20/5/1994	1 years
Kings Road depot (CMB) [Inland Lots 5532 & 7178, which became Inland Lot 8849]	17/3/1993	15/12/1995	2 years

CONCLUSION AND DISCUSSION

All four hypotheses on possible government preferential treatments of franchised bus companies were refuted. (In other words, Stage I in Figure 2 was completed.) All in all, there is evidence from franchise terms, land transaction mechanisms, and other records to defeat the conspiracy theory about government concessions to bus companies when it allocated individual bus depots, but this matter should be subjected to a further valuation study (Stage II in Figure 2) on the premia of lease modifications for a few depots for the sake of comprehensiveness. Any possible concession under PTG could be treated as an implicit consideration of the less exclusive route franchising system, which has been in place since 1975. However, this is just a conjecture, and even if it were valid, it has little significance in terms of numbers, as only two KMB depots were involved. In any event, s.20 of the Public Bus Services Ordinance expressly disallows the use of bus depots for non-bus operational uses or for carrying out such uses outside these depots so that bus depots could be "idled" for other purposes. Poon's (2005) criticism could not be substantiated yet.

Besides the two subsequent stages of research shown in **Figure 2**, the effect of the 1975 changes to the land allocation policy on the number and spatial distribution of permanent bus depots, as well as open air parking yards under STT, is an interesting economic geography question and this has been covered by Lai et al (2013).

Our initial presumption, informed by a Coasian theory of implicit considerations, shaped the hypotheses tests. However, the evidence collected indicated that other than the replacement of the public auction mode by the private treaty grant mode in land administration, there was no demonstrated preferential treatment of the franchised bus companies. Besides the provision of planned bus termini, the stated change in the land policy was an implicit consideration that did not involve any equity issue, as redevelopment was ruled out. How does the new depot allocation policy fare economically? On one hand, one may argue that this ban on redeveloping sites obtained by way of grant would not be conducive to economic efficiency, as the bus companies and the government would lose valuable intelligence on factor (land) costs and the development potential of the land. On the other hand, as a price-regulated monopoly, this arrangement may stimulate Schumpeterian innovation, which involves a downward shift of the cost curve (Lorne and Lai 2011, Lai

"Except with the written permission of the Commissioner, a grantee shall not: (a) use any premises provided and maintained in accordance with section 19 other than for the construction, repair, maintenance or parking of vehicles used by the grantee in connection with its franchise; or (b) undertake or permit to be undertaken the construction, repair or maintenance of vehicles used by the grantee in connection with its franchise, or the parking of such vehicles when they are not in use, other than in premises provided and maintained in accordance with section 19."

and Lorne 2012). Empirical evidence for this was provided by Lai, Chau, and Cheung (2013), who discovered that both franchised bus (as well as ferry) companies enjoyed scale economies.

It is worth examining the global picture of acquisition, decommissioning, and redeveloping depots in terms of timing, sequence, and location in relation to the actual operational needs of the bus companies. The results of such an examination would alleviate doubts about the strategic behaviour of bus companies in obtaining new depots by PTG and/or STT to replace those used for redevelopment. This would enable us to judge if any of the redeveloped depots was actually "idled" and reallocated for real estate profits or really redundant/in surplus and, hence, ripe for redevelopment. For such an examination, however, the collection of actual bus fleet and operational data is essential. Due to resource limitations, we did not attempt this task, which awaits further and better inquiry.

This case study should have important public policy implications not only for land administration practices, but also for the regulation of franchised transportation informed by the corollary of the Coase Theorem. It should also make a theoretical contribution to the economic understanding of the genesis and evolution of the franchised public transport operation as a legally protected monopoly.

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Surveying & Built Environment

Pillbox 315 on the Gin Drinker's Line

Lawrence WC Lai*, YK Tan**, George CY Leung***, and Daniel CW Ho****

ABSTRACT

This technical paper[1] describes the conditions of and recent survey findings for Pillbox No. 315 on the Gin Drinker's Line and makes recommendations on its heritage grade. This survey is the first[2] professional land survey of a Gin Drinker's Line pillbox.

[1] This paper is the second in a series of technical papers on individual pillboxes along the Gin Drinker's Line. The first was that by Tan (2011) in this journal.

[2] The first professional land survey of the Gin Drinker's Line defence system was that done for the Shing Mun Redoubt. See Lai et al. (2011). The land surveyor was Dr. Ken S.T. Ching. Some of the numbering of the pillboxes needs to be corrected following discovery of detailed sketches of the pillboxes and Shatin coastal search light shelters of this Line in the web for "Japan Center for Asian Historical Records" (http://www.jacar.go.jp). There is no record of PB315 in this useful source, however.

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THE LOCATION OF THE PILLBOX AND SURVEYS

The first author was told by second author that a Gin Drinker's Line pillbox (PB), identified by Lai et al (2009) from aerial photos,[3] still existed north of a 170 metres knoll near Kowloon Reservoir. The location of the PB was at what used to be Blockhouse No.28 of the Anderson Line, built in anticipation of an attack by China against Hong Kong (Weir, 2012). A shelter and some buildings can be spotted to the southwest and southeast, respectively, of the PB in the 1945 RAF aerial photos of the area. A war diary[4] (of 2 Royal Scots) mentioned that a Company Headquarters was located at the junction of Golden Hill and Tai Po Road. Therefore, it would appear that PB315 formed part of the defensive complex in the Kowloon Reservoir defence area along Tai Po Road.

On 4 January 2012, the authors and Tim Ko visited this PB with some former students. Mr. Ko told them that AMO staff were aware of the existence and location of this PB, which was to the north of a vacant Water Supplies Department site along Tai Po Road (Piper's Hill section) (**Figure 1a**), which commands a view of the main dam of the Reservoir. A "land search" at the Survey and Mapping Office established that the PB is within Government Land Allocation to the Water Supplies Department GLA-TW 262.

A second site visit was made in 24 January 2013 with a surveyor, colleagues, and guests of the Department of Real Estate and Construction in preparation for a detailed site survey. The survey was subsequently conducted under the supervision of the third author from 8 February 2013 to 9 March 2013 using traverses from government control points along Tai Po Road according to the conventional survey method by total stations. Funding for this land survey was provided by a Teaching Development Grant from the University of Hong Kong for the Common Core Course "Property Rights, Built Heritage, and Sustainable Development in Hong Kong." Independent follow-up field measurement exercises were conducted in April and May 2013 by the second author.

Figure 1a

Figure 1b

[3] See, for instance, RAF Photo 4111 681/5 dated 10 November 1945.

[4] WO 172 1690. We thank Rob Weir for this piece of information. (see http://discovery.nationalarchives.gov.uk/SearchUI/Details?uri=C946057)

Figure 1c

Figure 1d

THE GENERAL INTERNAL LAYOUT OF THE PILLBOX

A pillbox is a strong defensive shelter equipped with machine guns. This PB is definitely PB315, as the number was cast in concrete at its tunnel entrance (**Figures 2a, b**).

Figure 2a

Figure 2b

The internal condition of PB315 was very good when it was inspected. It is a large pillbox with three firing loopholes arranged in two chambers or compartments separated by a wall of about 3 feet or (92 cm) thick.

The smaller, northern front chamber has two firing posts with two apertures or loopholes (**Figures 3a, b**): one facing NNE (in the direction of the dam of the Kowloon Reservoir (**Figure 1b**)) and the other NNW. It covers Golden Hill Road and the area around the dam of Kowloon Reservoir. This chamber is separated from the main chamber by a three-foot thick wall. Its design ensured that the third firing post in the main chamber could still fire even if both posts in the front chamber were put out of action by direct hits by relatively small caliber ammunition and, of course, not involving any chemical or similar agents.

The bigger main chamber to its south, which connects to a backroom, has just one aperture (**Figure 3c**) facing

NW (in the direction of the dam of the Kowloon Byewash Reservoir (**Figures 1c and 1d**)) and remnants of the hooks that held folding beds for soldiers. The main chamber of PB315 was also its living area, which was much bigger than those in other mainland side pillboxes. From the number of hooks, we deduced that a total of nine folding beds could be mounted on three side walls. Compared to other mainland pillboxes manned by ten soldiers with only six beds, PB315 seems to have been able to accommodate more than ten soldiers. Due to the provision of a firing post to cover access (now called Cheung Yuen Road) and the dam of Kowloon Byewash Reservoir, PB315 is asymmetrical in shape. This enabled the PB to provide full firing coverage of the locality without any "blind" area.

A metallic rack was found along a wall of the chamber. This might have been used to mount the telephone system for the commander in the command post. This post was normally located in the rear chamber in other pillboxes for better protection. Because this area was partly separated from the front chamber by a concrete wall three feet thick, it can occupy the central region of the PB with more space (**Figure 3d**).

The interior of the pillbox is quite wet during the rainy season. During our surveys, rainwater dripped down from the roof of the pillbox. Many water drops also formed on the roof due to the condensation of moisture.

Figure 3a

Figure 3b

Figure 3c

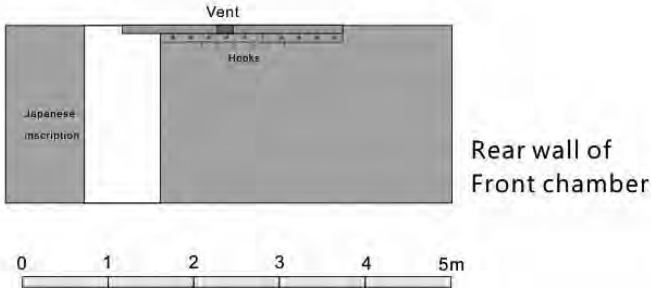

Figure 3d

Figure 3e

Figure 3f

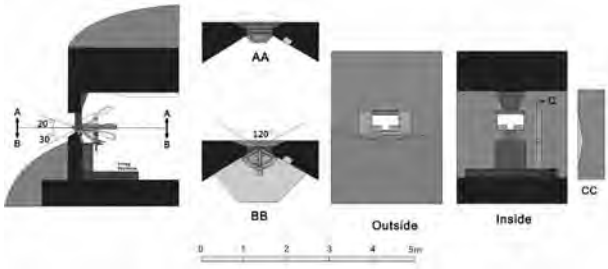

Figure 3g

Although it has lost all steel gates, doors, and fittings, the structure of the PB, including its entrance tunnel, was intact. It retained one ventilation vent or chimney (**Figure 4**). It was clean and enthusiasts have placed concrete plates over the three apertures to prevent earth from coming into the PB when it rained. The surface of the PB was intact (**Figure 5**) and there was no removal of the steel bars from within the surface concrete of the PB, as had happened to PB313 (**Figures 6a, 6b and 6c**). As such, PB315 is a highly valuable military heritage building, as almost all the pillboxes along the Gin Drinker's Line had been blown up by the military during the 1950s. At present, only three other PBs, namely PB313 (**Figures 6a, 6b and 6c**), PB314 (**Figures 7a, b and c**), and PB426 (**Figure 8**), have survived. PB426 is occupied by squatters and PB314 is hard to reach, as it is high up on a slope along Golden Hill Road.

Figure 4

Figure 5

Figure 6a

Figure 6b

Figure 6c

Figure 7a

Figure 7b

Figure 7c

Figure 8

The horizontal layout and the three vertical sections of the PB loopholes based on the land survey by the third author are shown in **Figures 9 and 10**. An artist's impression of the horizontal plane and a vertical profile of the PB based on the second author's follow up survey are shown in **Figure 11**. From **Figure 10**, we can see that the roof of the pillbox is three metres thick. Its floor slopes gently towards the tunnel, which dips towards the entry trench. This is obviously to prevent flooding of the pillbox and for anti-grenade purposes.

The reinforced concrete roof and walls were both about 3 feet (92cm) in thickness. However, some areas around the firing loops were only about 1 foot (30cm) thick.

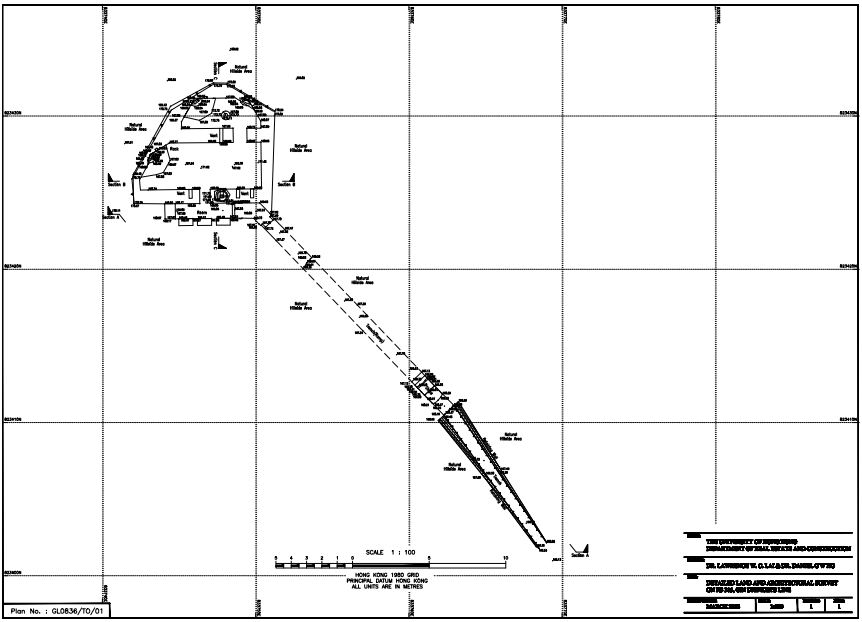

Figure 9

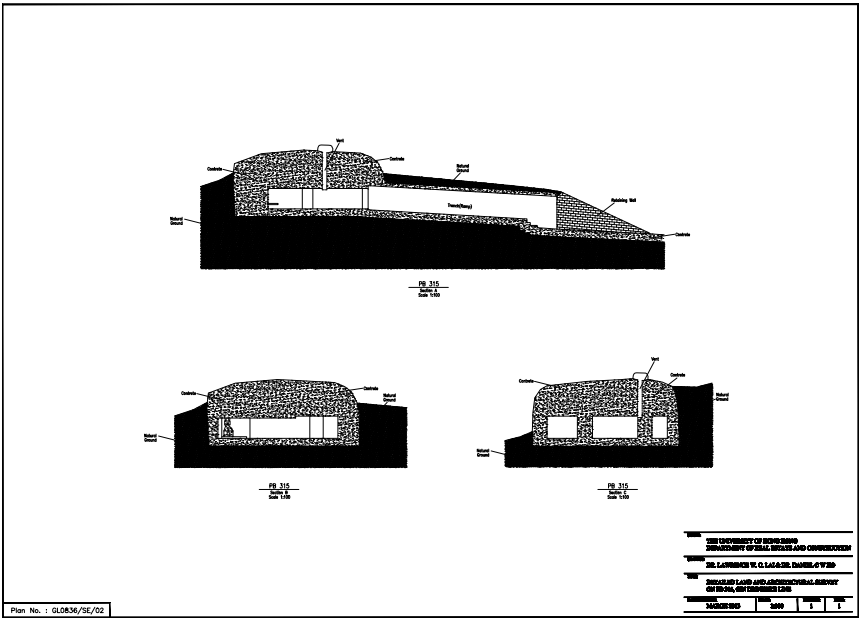

Figure 10

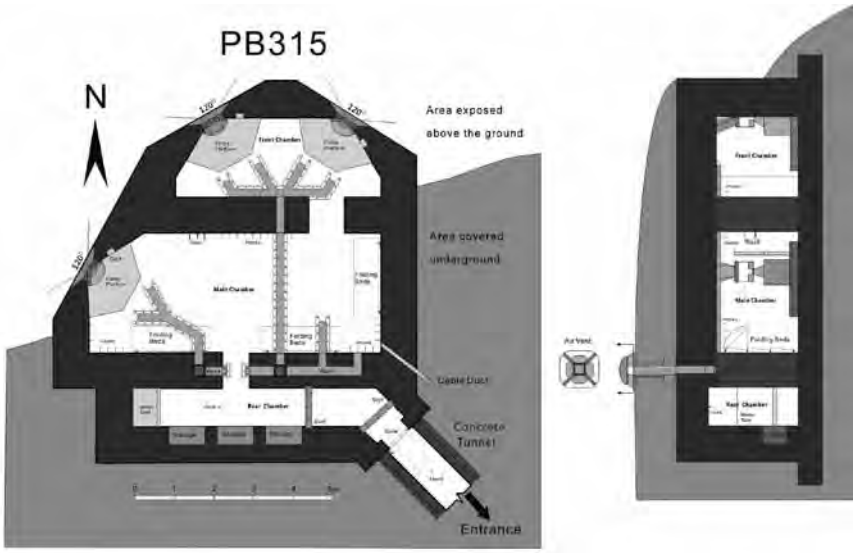

Figure 11

THE FIRING LOOPHOLES

Unlike their Island counterparts, Gin Drinker's Line PBs had far smaller loophole openings on the outside. The V-shaped opening of the loophole in this PB on the outside is very shallow (just 15 cm). A smaller loophole opening surely reduced the risk of a direct hit. The front walls around the firing loops were the thinnest and weakest points of all the pillboxes constructed along the Gin Drinker's Line due to an "open from the inside" design. This allowed a wide arc (120 degrees) of fire.

The firing loophole or loop measured around 60cm x 50cm. Inside the pillbox, a 70cm high semi-circular concrete stand was constructed below each firing loop for the installation of a machine gun mount, which provided the pillbox with additional protection. Above the firing loop was a triangular-shaped reinforced concrete structure connected to the roof.

A 12cm x 150cm slot was found on the wall to the right of every firing loop. Its function probably was to prevent the machine gun's ammunition belt from making contact with the wall when it was rotated all the way to the right. As in the case of other pillboxes along the Gin Drinker's Line, a half hexagon-shaped platform was constructed around the firing post (**Figures 3a, b, c**).

Also, unlike the loophole in an Island pillbox, which was equipped with steel shutters, a mainland pillbox only had a steel beam fixed to the top of the opening to stop/deflect bullets when they hit the top parts of the loophole (**Figure 3e**). A hole and a slot found on the walls to the right and left of the aperture behind the steel beam, respectively, suggested that something

to shut the opening could be fixed or removed to protect the crew (**Figure 3e**). Two bolts were found on the wall to the left of each loophole. These do not exist in an Island PB (**Figure 3f**). A triangle-shaped concrete structure located at the bottom of the loophole was probably used to plug the gaps around the machine gun mount. Details of the lower section of the loophole were unclear, as it was covered by mud washed into the PB. Sections of the loophole are shown in **Figure 3g**.

THE BACK ROOM AND ENTRY TUNNEL

All pillboxes along the Gin Drinker's Line also had "back rooms" behind their "combat areas". Such a room was surrounded by thick concrete walls and connected to the entry, which was the best-protected area in the whole pillbox (**Figure 12a, b, c**). It could shelter soldiers when they came under heavy fire and allowed them to escape if needed. Storage space was built inside the wall for ammunition and supplies. A water tank was usually installed in the back of the storage area to provide cooling water for the machine gun.

The entrance to the pillbox (**Figures 13a to 13e**) was located on the side of the "back room," which was the only way to enter and exit. Two slots were found on the roof and along the wall in front of the entrance. Compared to other pillboxes, these slots might have been used to install a pair of roller doors to prevent attackers from penetrating into the structure.

The layout of the entry tunnel system is presented in **Figure 13e**. The entrance was connected by a concrete trench constructed at an angle from the entrance to prevent fire along the tunnel or trench from penetrating the entrance.

Figure 12a

Figure 12b

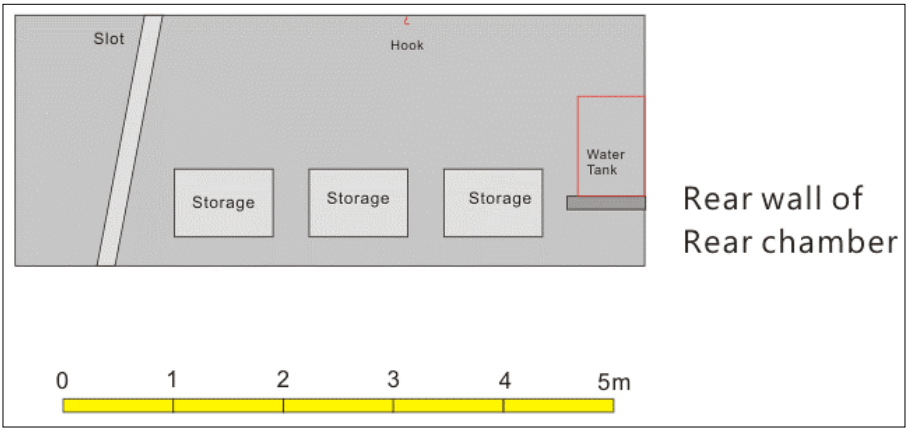

Figure 12c

Figure 13a

Figure 13b

Figure 13c

Figure 13d

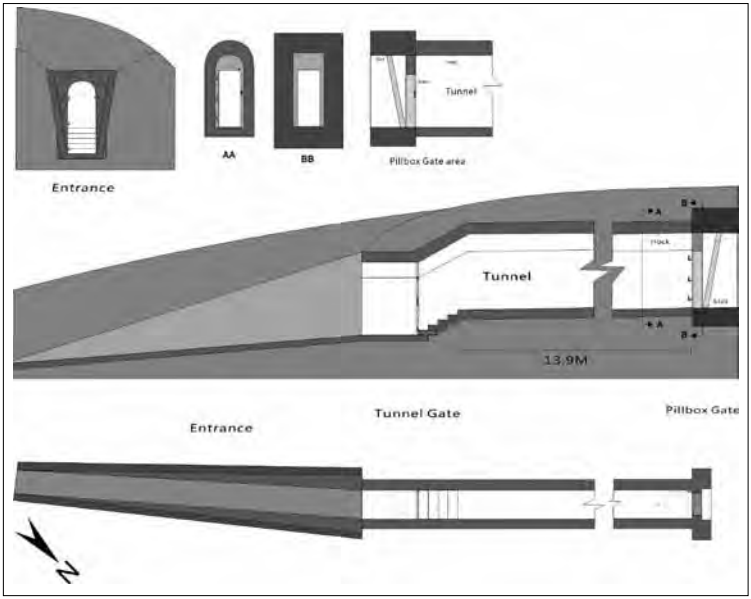

Figure 13e

VENTILATION

The internal wall separating the "combat area" from the "back room" also doubled as the pillbox's ventilation system. A 20cm x 20cm duct was built horizontally inside the 90cm thick wall just under the roof. It was connected to a vertical duct that passed through the roof to the vent shaft above. Whereas the horizontal ducts in other GDL pillboxes were built into the separation walls, thus creating weak points along the connection zone between the top of the wall and the roof, the horizontal duct of PB 315 was built into the pillbox roof and connected to the vent openings on the wall below. Several metal ducts were mounted on the roof to channel outside air to the pillbox. The bolts mounting the ventilation ducts on the roof were still visible (**Figures 14a, b, c, and d**).

Figure 14a

Figure 14b

Figure 14c

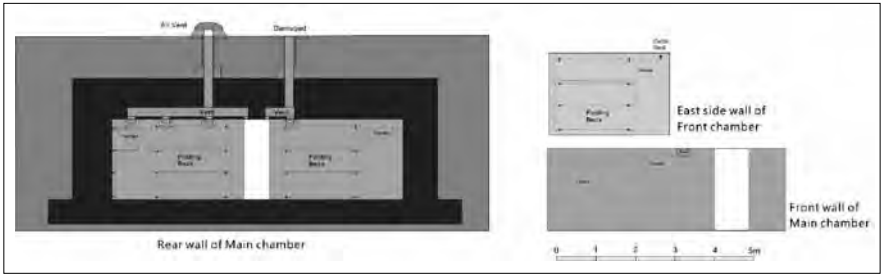

Figure 14d

The surviving ventilation shaft on top of PB315 looks like a flat mushroom from the ground level and, hence, was difficult to spot from the air and far away (**Figure 4**). This design is rare in surviving PBs or shelters in Hong Kong, but resembles those found in 1949 RAF aerial photos of PB 419 (Lai et al. 2009, p.30). Note that pillboxes in Hong Kong used natural air flows for ventilation via a vent shaft built high above the PB roof (**Figure 14e**). Exhaust air in the pillbox is expelled via the shaft and replaced by fresh air coming in from the entrance and loopholes. No mechanical ventilation was required. However, this design might not be efficient to remove all fumes from the combat area, nor was the pillbox gas-proof.

Figure 14e

DEFENCE HISTORY

The design of PB315 is unique and different from that of other mainland pillboxes. It has a much bigger main chamber with better protection. It was capable of housing more soldiers (nine beds) than other pillboxes (normally six beds each). A shelter and another building could be found nearby, as shown in RAF aerial photos taken over the area in 1945. The beaten areas of the PB covered a wide sector, including the dam of the Kowloon Byewash Reservoir, the lower reaches of Golden Hill, and the dam of the Kowloon Reservoir, across which Golden Hill Road led to Smugglers' Ridge and is now part of Tai Po Road (**Figure 15**). These factors reflect on the importance of PB315 as the final major strong point to block the Japanese advance from the north along Tai Po Road or from Golden Hill. It might have also been used as a headquarters for the area's defence.

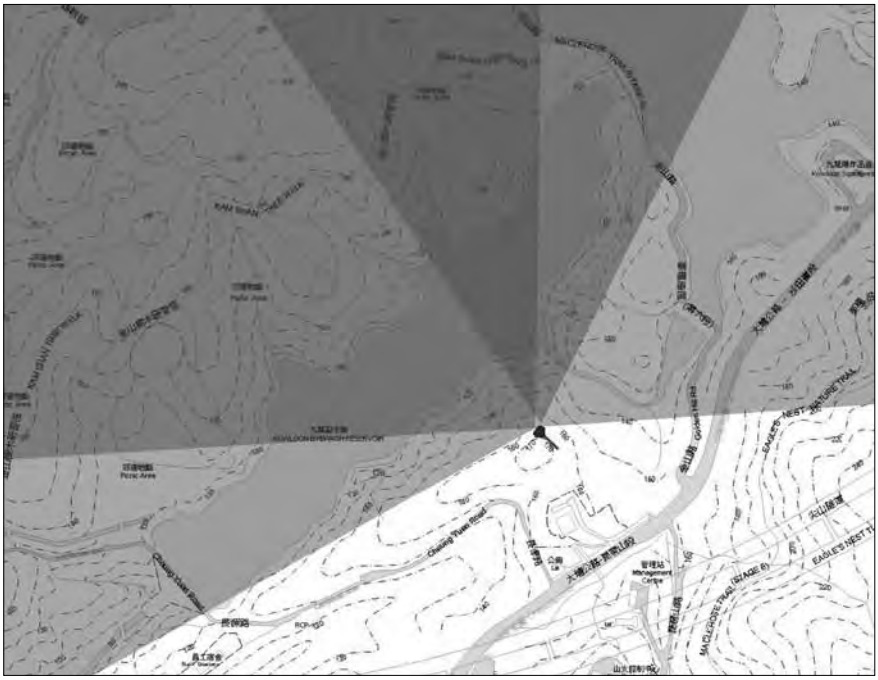

Figure 15

The war diary of the 2nd Battalion of the Royal Scots mentioned that on the morning of 11 December, the Punjab reserve company was in the vicinity of PB315. According to the diary,[5] at 1050, 10 December 1941, the 2/14 Punjab stabilized the line from PB315 to the front of the Filter Bed (along Tai Po Road). Then, at 1140, the company commander of the Reserve Company of the 2/14 Punjab reported "one platoon position at PB315". However, no war diary reference to manning or fighting of this pillbox was found. It was likely that any crew who manned this PB was from D Company or 2nd Battalion Headquarters (HQ) Company of the Royal Scots. Since PB315 was at the far rear of the Shing Mun Redoubt, it was possibly manned by D Company, which acted as a reserve until the early morning of 10 December 1941. Also, since the PB protected the 2nd Battalion's HQ at the Filter Beds farther down Tai Po Road and was located at some distance from the defence area of D Company north of the ridge of Golden Hill, it could also have been manned by spare hands from the HQ Company.[6] This is just speculation that awaits verification by military historians. Our findings should provide them with accurate geographical information.

[5] WO 172/1690. Courtesy, Mr. Rusty Tsoi.
[6] Courtesy, Mr. Rusty Tsoi.

Some Japanese inscriptions were found by the second author along the tunnel walls at the tunnel entrance and the front chamber (**Figures 16a, b, c**). They were probably left by Japanese soldiers during the Battle of Hong Kong. One dated the event as "16 12 9" and the other "16 12 10", which, respectively, means 9 and 10 December, 1941. The 16 stood for the 16th year of the then-Japanese emperor's reign, which began in 1926 (**Figure 16c**).

Figure 16a

Figure 16b

Figure 16c

OVERALL CONDITION

The current condition of PB315 is quite good. However, some parts need more attention. Landslides due to rainwater have blocked almost all of its loopholes and some mud has washed and seeped into the pillbox from the loopholes and buried the firing posts. So much water entering the pillbox from the ventilation holes suggests that damage to its ventilation system has occurred. Two big trees are growing on top of the pillbox. Their weight has placed much stress on its superstructure. The roots of the trees have likely further damaged the pillbox structure. A lot of water was found inside the pillbox after a series of rains. Some rebar inside the wall has been seriously corroded and has caused spalling of concrete (**Figure 17**). A large landslide on the slope below the pillbox occurred recently which suggests that the slope may not be very stable. There is a need to carry out proper structural maintenance work and repairs in order to conserve this heritage piece.

Figure 17

RECOMMENDATION FOR HERITAGE GRADING

Unlike other Gin Drinker's Line pillboxes, which were either destroyed after the war or are too remotely located from the urban areas, PB315 is in almost intact form within a government closed area. It has suffered comparatively minimal damage and has so far lost only its metal fittings. It is the only Gin Drinker's Line pillbox and tunnel structure that still remains more or less intact. It witnessed troop movements by both the Allies and Japanese during the Battle of Hong Kong and is, therefore, a unique sample of military architecture and an important historical site. It has great conservation value for memorial and educational purposes.

This pillbox merits heritage Grade 1 protection and rehabilitation to promote built and historical heritage appreciation for the following reasons:

1) It has a history of more than 75 years as a part of the Gin Drinker's Line, which was completed in 1937/1938, and was part of Hong Kong's chief defensive line, which saw action during the Second World War. Thus, it has local, national, and international historical significance.
2) This pillbox is a rare surviving example of a WWII pillbox and its accompanying tunnel system.
3) This pillbox is located within government land and a water catchment area with nearby building structures (Water Supplies Department's quarters[7], **Figure 18**) that can easily be converted into a Gin Drinker's Line or even a Battle of Hong Kong tourist centre/ museum.
4) As PB315 is located near Tai Po Road, it is a very accessible pillbox for the public.
5) Rehabilitation would not be too costly, as the structure is small, simple, and still in good condition.

Figure 18

[7] It could well be an ex-British officer house built before the war.

ACKNOWLEDGEMENTS

The authors are grateful to Mr. Rusty Tsoi for sharing information from the war dairies of the Royal Scots.

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Surveying & Built Environment

PB 3 during the Battle of Wong Nai Chung Gap: From the Japanese Perspective

Kwong Chi Man, Tsoi Yiu Lun

ABSTRACT

This paper attempts to revisit the intensively-studied Battle of Wong Nai Chung Gap by looking at the previously-unseen Japanese archival sources from the National Institute for Defence Studies, Japan and field inspection. Previous accounts about the Battle, mostly based on the British sources, could not match the damage observed in field studies. On the other hand, the events described in the Japanese material can be supported by field observations as well as the recent GIS survey of the battlefield. Not only does this shed new light on our understanding of the Battle itself, this article also illustrates the need for researchers to conduct both detailed fieldwork through GIS and surveying techniques and thorough archival research.

INTRODUCTION

At least one British account records that PB 3, a British pillbox that was located near Black's Link on the south-western side of Wong Nai Chung Gap, did not open fire during the battle between the British and the Japanese forces on 19 December 1941 (Lai, 2001). As part of an investigation to the battle, Lawrence Lai et. al. (2009, 2011) have pointed out the need to accurately to measure the defensive structures of the major engagements during the Battle of Hong Kong in December 1941 and create accurate maps. Using GIS and land surveying techniques, Lawrence Lai and his team have recreated the firing zone of PB 3 (Lai, 2011). Based on this breakthrough, this paper tries to investigate the action of PB 3 during the chaotic battle by looking at previously-unseen Japanese sources, notably the War Diaries of the 38th Division, the 230th Regiment (hereafter as 230th Rgt), and the attached artillery unit, as

well as the reminiscences of the Anglo-Canadian forces. Results from archival study and on-site inspection suggest that PB 3 was one of the first British posts that responded to the penetration of the Japanese forces into the Gap in the early morning of 19 December. Although it was neutralized early on by the Japanese forces, it alarmed other British forces in the Gap and thus contributed to the heavy casualties sustained by the Japanese forces during the battle.

The use of Japanese sources to supplement the existing accounts not only helps clear up the history of the Battle of Wong Nai Chung Gap and highlights the Japanese superiority in firepower during the battle, but also contributes to the preservation effort by identifying the damage on the surviving structure.

JAPANESE LANDING ON 18 DECEMBER

On 8 December, Japanese forces entered Hong Kong from the Hong Kong-China border in the New Territories. Although the British forces had conducted a successful demolition campaign in the New Territories, they were unable to delay the Japanese advance for more than three days because of the fall of the Shing Mun Redoubt. After the British withdrawal from the mainland, Hong Kong Island came under siege. Between 12 and 18 December, Japanese heavy artillery intensively shelled the defences and the facilities on the northern shore of the Island. When the British garrison refused twice to surrender, Japanese forces landed on the Island in the evening of 18 December.

Contrary to the common perception about the Battle, the post-battle report of the 23rd Army admitted that the Japanese forces had made little provision for the capture of Hong Kong Island. The staff of 38th Division expected that, should they land on the Island, the garrison would soon surrender. It was expected that the three Japanese regiments (228th, 229th, and 230th Regiments) in the Division would reach the line between High West and the Royal Naval Dockyard by dawn the day after landing on the northeastern coast of the Island. Specifically, 228th Regiment (Rgt) would land at Tai Koo, 229th Rgt at Aldrich Bay, and 230th Rgt at North Point. From Japanese sources, one can see that the Japanese made little or no attempt to conduct a coordinated thrust for Wong Nai Chung Gap. All three regiments were therefore to land on the broad front between North Point to Shau Ki Wan and would then swing towards the City of Victoria like a door closing across the whole of Hong Kong Island. The plan was not as such an attempt to "cut off" the two British brigades on the Island. In actual movement, 229th Rgt moved towards Chai Wan and then the Taitam area through the Mount Parker area, pushing the East Infantry Brigade (under Brigadier Cedric Wallis) towards the West Infantry Brigade (Brigadier John Lawson of the Canadian forces). The East Brigade consisted of 5th Bn. 7th Rajput Regiment, 1st Bn, Royal Rifles of Canada, B and D Companies (Coy) of 1st Bn, Middlesex Regiment, and 1st, 2nd, and 3rd Coy of Hong Kong Volunteer Defence Corps (HKVDC), while the West Brigade consisted of 2nd Bn, 14th Punjab Regiment, 2nd Bn, Royal Scots, A, C, Z Coy of 1st Bn, Middlesex Regiment, and 4th,

5th, 6th, 7th Coy of HKVDC.[1] At 19:00 on 18 December, after an intense pre-landing bombardment, the first wave of Japanese forces left the mainland in its inflatables and moved towards North Point, Taikoo, and Aldrich Bay. The invaders were spotted by the Rajput battalion (Lt. Col. Cadogan-Rawlinson), which had suffered only minimal losses during the fighting on the mainland. At around 20:00, the Indians opened fire on the Japanese boats, but it was too late to prevent the landing. The first wave of the 230th Rgt landed at North Point at 20:15 and gradually pushed the Rajputs towards Choi Sai Woo near Braemar Hill. On its left, 228th Rgt landed near Taikoo Dockyard and also engaged with the Rajputs in hand-to-hand combat. Further left was 229th Rgt, which engaged with 1st Bn, Royal Rifles of Canada and generally moved towards Mount Parker.

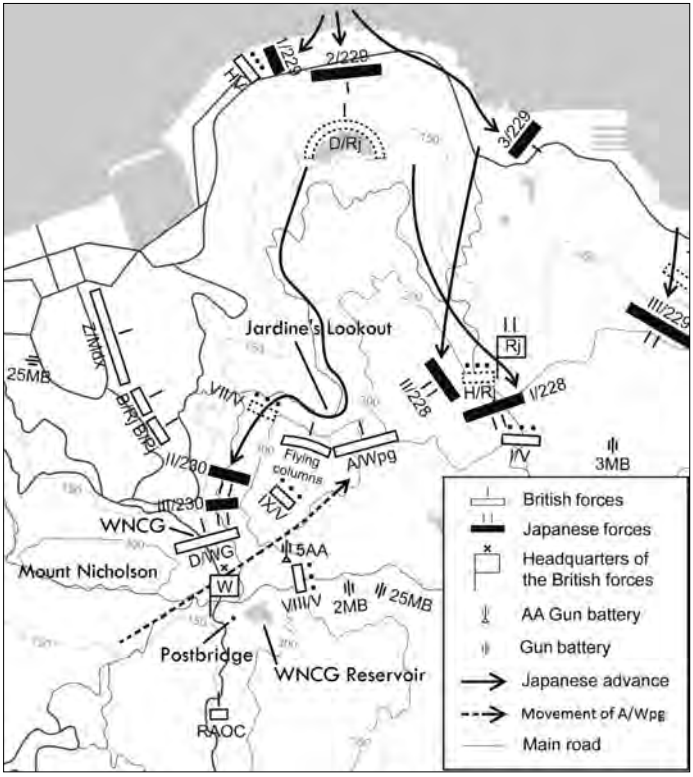
MOVEMENT OF THE 230TH REGIMENT

West Brigade responded to the Japanese landing by sending reinforcements towards North Point, Taihang and Jardine's Lookout. Brig. Lawson attempted to form a continuous line stretching from Causeway Bay to Jardine's Lookout through Taihang, which was still being defended by the B Coy of the Rajputs, later with troops from the Middlesex, Punjab, and Winnipeg battalions. Meanwhile, Brig. Wallis tried to contain the Japanese advance towards Chai Wan by ordering C Coy of the Royal Rifles to counter attack and the shelling of the northeastern Coast. Just as the British were attempting to contain the Japanese advance, the Japanese 230th Rgt was stuck near the North Point Power Plant, where the Hughesiliers[2] and the remnants of a platoon from the Middlesex battalion fiercely resisted until the afternoon of the 19th. Besides, B Coy of Rajputs put up a stiff resistance near Taihang and launched several counterattacks.

To bypass the enemy stronghold and exploit the gap opened by the collapse of D Coy of the Rajputs, Col. Shoji Toshishige of 230th Rgt decided to change the plan and move southwards instead of southwestwards into Taihang. He chose to move even more southwards when one of his company encountered stiff resistance from 7th Platoon of the Hong Kong Volunteer Defence Corps (HKVDC) north of Jardine's Lookout. Col. Shoji, who determined to outflank the perceived strong enemy forces on Jardine's Lookout, moved southwards on the uphill side of the HKVDC positions. Thus, he led his two battalions (the third serving as reserve in Kowloon) onto Sir Cecil's Ride, the only mountain path that was supposedly covered by the British forces. Although Shoji nominally had two battalions under him, at that time there were only four companies (around 800-1,000 men) moving along Sir Cecil's Ride with him. They belonged to the 3rd Battalion (the Noguchi battalion, consisting of two companies, 9th and 12th Coy) and the 2nd Battalion (two companies).

[1] "Dai sanjuhachi shidan Honkon kōryakusen sentō shōhō," Shina-Shina shihen: nanshi-15, Archive of the Institute for National Defence Studies, pp. 202-211; for the general situation and the British order of battle, see Kwong Chi Man, Tsoi Yiu Lun, Eastern Fortress: A Military History of Hong Kong (Hong Kong: Hong Kong University Press, 2014), pp. 186-7.

[2] Its official designation was 2nd Independent Platoon, HKVDC.



*All units on the map are infantry units.
** WNCG: Wong Nai Chung Gap

Fig. 1: The advance of the 230th Rgt into Wong Nai Chung Gap (simplified), 2100, 18 December-0330, 19 December

In pitch dark, the Japanese forces were unaware of the whereabouts of the British forces, and they marched very slowly along the Ride in two ranks. They also went undetected when marching through the line west of PB 2 held by a section of D Coy of Winnipeg Grenadiers; the section probably moved to their daylight position from Sir Cecil's Ride prior to dawn, leaving the Ride undefended. The advanced element of the 230th finally reached the southern end of Sir Cecil's Ride, in low ground northwest of Wong Nai Chung Reservoir at around 03:30-04:30 in the early morning.[3] This can be shown by the maps contained in the War Diaries of the 3rd Coy HKVDC as

[3] About the British deployment in the Gap, see "Edited War Diary of No. 3 HKVDC," Hong Kong Public Records Office HKR S225-1-48-2. For Japanese actions, see "Hohei dai nihakusanju rentai Honkon kōryakusen sentō shōhō," RIS, NIDS, JACAR, C13031788000.

well as of the 230Rgt (Fig. 2.1, 2.2 and 3). The troops of the 230th were the packed columns spotted by Lt. Bevan Field in PB 1 in the early morning of 19 December.[4]

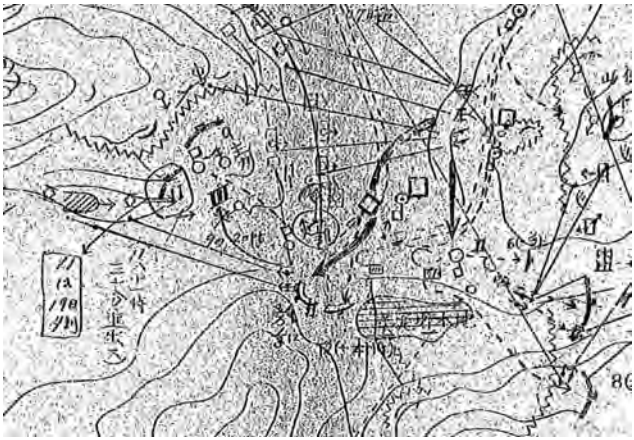


Fig. 2.1

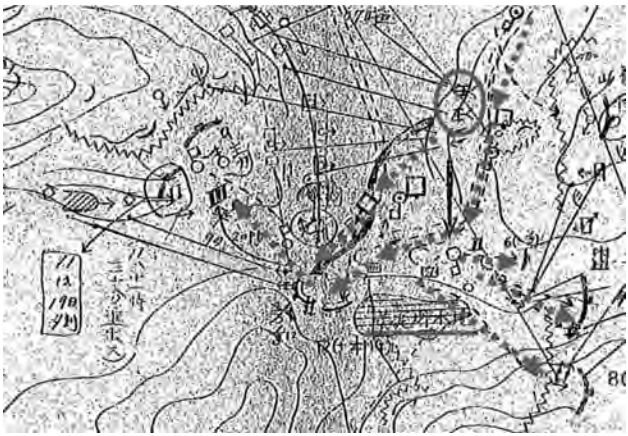


Fig. 2.2

Fig. 2.1 and 2.2: Map in the War Diary of the 230 Rgt showing the action in Wong Nai Chung Gap. Movement of troops shown by dashed line and thick black arrows. Thin arrows showing artillery/machine gun fire. The two rapid-firing guns that accompanied the 230 Rgt were also shown. Two machine guns attached to the 3rd Bn were also shown near the guns. The red dashed line in 2.2 shows the movement of the Japanese troops. The underlined Kanji read "Concrete Reservoir (英泥貯水池)". "Dokuritsu sokushahō dai go daitai dai san chutai sentō jōhō (Combat Report of the 3rd Coy of the 5th Independent Rapid-firing Gun Battalion)," RIS, NIDS, JACAR, Ref: C13031807100.

[4] Phillip Bruce, *Second to None: The Story of the Hong Kong Volunteers* (Hong Kong: Oxford University Press, 2001), p. 245.

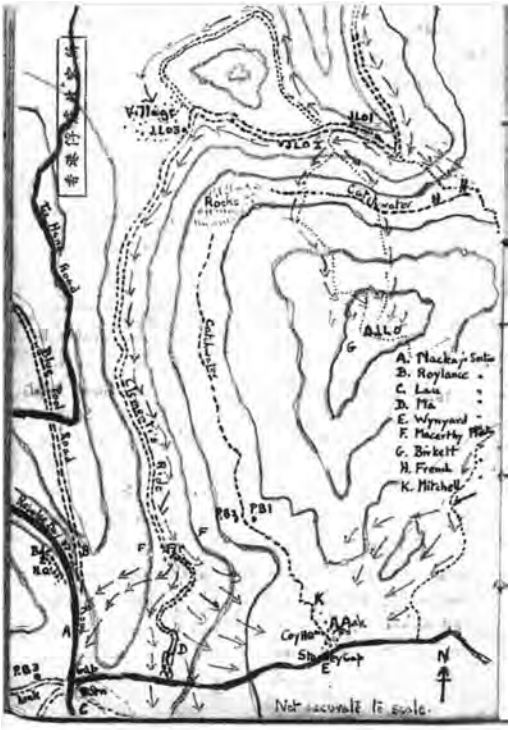


Fig. 3: Map in the War Diary of 3rd Coy HKVDC showing the movement of Japanese troops near the end of Sir Cecil's Ride. The movement of the Japanese troops is shown by the arrows. They largely match with the description of Fig 2.1 and 2.2. "Edited War Diary of No. 3 HKVDC," Hong Kong Public Records Office HKR S225-1-48-2.

BRITISH TROOPS IN THE GAP

As Lawson had deployed most of his troops to Jardine's Lookout, the Gap was only lightly defended on the early morning of 19 December. D Coy of the Winnipeg Grenadiers battalion was guarding the northern entrance of the Gap with its 16th platoon serving as a "Flying Column" and redeployed to Stanley Gap. 3rd Coy HKVDC. Lt. B. C. Field with 19 men of No 9 Platoon were holding PB 1 and 2 on the southwestern slope of Jardine's Lookout. PB 3 was above the eastern entrance of Black's Link on the western side of Wong Nai Chung Gap. Outside PB 3, there were a number of positions housing several sections of HKVDC soldiers (Lai, 2011). The police station on "Police Station Knoll" at the southern entrance of the Gap (around 50m southeast of PB 3) was only guarded by policemen. South of the police station was a mansion called Postbridge, owned by Mr. George Tinson, a civilian barrister.

It was manned by troops from the Royal Artillery and Hong Kong Royal Naval Volunteer Reserve. Brig. Lawson had tried to establish an all-round defence for the Gap, but there were gaps between units due to the broken terrain.

FIRING ARC OF PB 3

Before discussing the events from the British and Japanese accounts, it is necessary to see if PB 3 could spot and fire at enemy emerging from the direction described above; the end of Sir Cecil's Ride between Wong Nai Chung Gap Reservoir and towards Police Station Knoll. Through line of sight analysis and other surveying methods, Lawrence Lai and his team found that although PB 3's arc of fire did not cover PBs 1 and 2, Sir Cecil's Ride, Blue Pool Road, the West brigade Headquarters in the Gap and the southern section of Wong Nai Chung Gap Road, it did cover the Police Station and the northern part of the Reservoir (Lai, 2011).

Destruction of the PB 3

According to the War Diary of 230th Rgt, after reaching the southern end of Sir Cecil's Ride, at 03:30 Col. Shoji decided to take action against Mount Nicholson and Jardine's Lookout and redeployed his battalions[5]:

> …the 3rd Battalion (the Noguchi battalion) will be on the right wing, and its frontage should be extended from the three-way junction near the northern side of Jardine's Lookout (near Blue Pool Road) in order to attack Mount Nicholson…
>
> …the 2nd Battalion (two companies) will be on the left wing, and should coordinate with the 3rd Battalion by attacking Jardine's Lookout…

In short, the 2nd Battalion was to attack the rest of Jardine's Lookout from the west[6], and the 3rd Battalion, which was near the southern end of Sir Cecil's Ride, was to take Mount Nicholson from the southeast.[7] At this time, most of Shoji's troops were still marching along Sir Cecil's Ride and moving southwards. From the records (see below), 2nd Bn did not participate in the subsequent battle, even after the silencing of PB 3, instead turning northwestward to attack Stanley Gap and Jardine's Lookout. No attempt was made to organize a coordinated attack between 230th Rgt and other regiments. Thus, only two companies of the 3rd Bn and the attached machine gun from the Machinegun Company of the battalion (around 250 men in all)[8] would be present during the early part

[5] "Hohei dai nihakusanju rentai Honkon kōryakusen sentō shōhō," op. cited.

[6] As the two battalions were deployed along Sir Cecil's Ride, 2nd Battalion was actually on the western side of Jardine's Lookout. Thus, it attacked the area from west to east.

[7] "Hohei dai nihakusanju rentai Honkon kōryakusen sentō shōhō (Report of the Action of the 230th Infantry Regiment during the Invasion of Hong Kong)," Rikugun ichihan shiryō (RIS), National Institute for Defence Studies (NIDS), Japan Centre for Asian Historical Records (JACAR), C13031788000.

[8] At that time, the 3rd Bn had 34 officers and 768 other ranks. It had four infantry companies and one machinegun company. The companies of the regiment were mostly at half strength: for example, 4th Coy had only four officers and 125 men.

of the Battle of Wong Nai Chung Gap. Accompanying the 230th Rgt was the 3rd Coy of 5th Independent Rapid-firing Gun Battalion (hereafter as 3/5 IRGB) equipped with eight Type 94 37mm rapid firing guns. According to the War Diary of 3/5 IRGB, two sections of Type 94 guns (one gun for each section, led by Corporal Yamanaka Isami and Sergeant Ito Kinichi) were attached to the 3rd Bn, 230 Rgt. Together there were one officer and 68 men to transport the dissembled guns and ammunitions.[9] Type 94 was a flat-trajectory gun extensively used by the IJA as close-support and anti-tank weapon. During the battle of Hong Kong, the Japanese forces expended at least 6,856 rounds of Type 94 ammunition. Among them, 3,630 were HE (high explosive) shells and 3,226 were AT (anti-tank) shells.[10] This weapon gave the Japanese a distinct advantage in firefights during the Battle of Hong Kong, as it enhanced the firepower of the Japanese infantry formations at short and medium ranges. On the other hand, the British, equipped only with rifles, Bren guns, grenades, and 2-inch mortars, lacked such a weapon in their infantry formations.

According to Evan Stewart's account, PB 3 had not opened fire while the rest of the British forces in the Gap were engaged. As Lai (Lai, Ching, Ko, et. al., 2012) pointed out, Stewart noted that "P.B. on Black Link, close to Gap, did not open fire, for some unexplained reason – possibly not occupied!".[11]

The defenders of Postbridge, who also witnessed the early phase of the battle, described the events as follows[12]:

> 05:45 Met hand grenades and MG fire, no casualties although we shouted our identity to the firers thinking they were further Indian or Canadian troops. Took temporary cover in a nullah round a corner.
>
> 06:00 Capt. Avery, H.K. Regt. R.A., now turned up from "POST BRIDGE" and after investigation with Lt. Cmdr Dulley (the HKRNVR party) we were surprised to hear that it was the Japanese who had fired on us.
>
> 06:20 Joined forces in "POST BRIDGE" with the 3 British Officers and 15 or so Indian Other Ranks of the HKSRA already there under the command of Major Crowe...
>
> 06:45 Japs seen running westwards along a ridge to the WONG NEI CHONG Police Station, but army officers ordered withholding of fire because the figures might not have been Japs and they were considered out of range.

[9] "Dokuritsu sokushahō dai go daitai dai san chutai sentō jōhō," RIS, NIDS, JACAR, Ref: C13031807500.

[10] "Dai sanju hachi shidan Honkon kōryakusen sentō shōhō: fuhyō (Attachment of the Report of the 38th Infantry Division about the Invasion of Hong Kong)," RIS, NIDS, JACAR, C13031769200.

[11] Lai (2011) also pointed out that Stewart did not repeat this remark in his *Hong Kong Volunteers in Action* (2005).

[12] "Post Bridge House, Lt. J. C. MacDougall, RNVR," WO 106/2401A, Appendix H, National Archives, UK.

On the other hand, the War Diary of the 3rd Coy, 5th Independent Rapid-firing Gun Battalion contained the following description[13]:

> At dawn... the Yamanaka section (Corporal Yamanaka Isami) was under heavy fire from the valley at the front (facing west)... on its rear right, it was fired upon by a pillbox on Jardine's Lookout, and on its left it was also attacked by the enemy from Mount Nicholson. However, the Yamanaka section remained effective...
>
> At that time (marked on the map as 05:40)[14], the Noguchi battalion (3rd Bn, 230th Rgt) started to deploy. The 9th Coy (of the 3rd Battalion, 230 Rgt) was deployed in a position 20m to the left of our position (moving south-westwards, more to the west) to prepare its assault against Position One (they named the Police Station as Position One). However, the 9th Coy was fired upon by a pillbox 60m (米) away to the left (Position Two, see Red Circle in Fig. 4.1). As the assault of the 9th Coy was effectively blocked, the Ito section (Sergeant Ito Kinichi) started to fire at the left embrasure of Position Two, which was suddenly silenced at around 06:00. Seizing the opportunity, 9th Coy moved forward and captured Position One...

After its initial success, 9th Coy continued to advance towards the enemy position across the valley...after we utilized our firepower to the full, the enemy position was silenced and dead bodies could be spotted near the Gap. At around 06:40, 9th Coy successfully captured the position... (Fig. 1)

Summarising from the above accounts and Fig. 2 and 4, only 9th Coy participated in the initial attack against the Police Station. It was deployed in the area near the end of Sir Cecil Ride (largely the present-day Park Place and Girl's Guide Centre), giving it a front of around 100 meters for an attacking force of around 100 men, who were organised into three platoons that may not have all been in the attack line. When the company was being deployed, it was fired at by PB 3, and at least one gun of 3/5 IRGB fired at PB 3, which ceased fire afterwards.

The Japanese text itself is vague about the location from which the distance of "60m" was calculated. It could be calculated from the guns or from the Police Station, which was largely half way between the guns and PB 3. The map (Fig. 4.1), however, shows that the distance between the guns and Position Two was 60m. The so-called "60 meters" distance between the guns and PB 3 shown on the map was potentially problematic. As the War Diary of the 3/5 IRGB and the attached map noted, the two guns under Yamanaka and Ito received fire from three directions. Judging from the record and the map, it is possible that the two guns were deployed along Sir Cecil's Ride, slightly north of the Wong Nei Chong Gap end. This position allowed the guns to fire at PB 3 but also put them, as Lawrence Lai's study shows, within

[13] "Dokuritsu sokushahō dai go daitai dai san chutai sentō jōhō," RIS, NIDS, JACAR, Ref: C13031807000.
[14] The sunrise time on 19 December was 06:27.

PB1's beaten zone. As also illustrated by the study of Lawrence Lai, the occupants of PB 3 could train their guns against the Japanese forces coming from the west side of the pillbox near the police station and Wong Nai Chung Gap Reservoir (Lai 2011). Before the emergence of the heavy growth now in the area, the Japanese guns would have a clear line of fire against PB 3 some 50-100m away from their position northeast of the station. The Japanese record also suggests that they were shooting at a pillbox (tochika) with rapid-firing guns. From the Japanese map, the position of the "pillbox" they shot at was the same as that of PB 3 located by Lai (2011). In short, as the above accounts suggest, 9th Coy 230th Rgt approached the Gap from the northeast of the police station at around 05:40. The defenders of Postbridge were first attacked by the troops from the 3rd Battalion 230 Rgt (the only unit in the vicinity) when the latter was attacking the Police Station, and they witnessed the assault of the 9th Coy across the Gap against PB 3 later. Between the two events, PB 3 exchanged fire at close range with 9th Coy as well as the Japanese rapid-firing gun platoon.

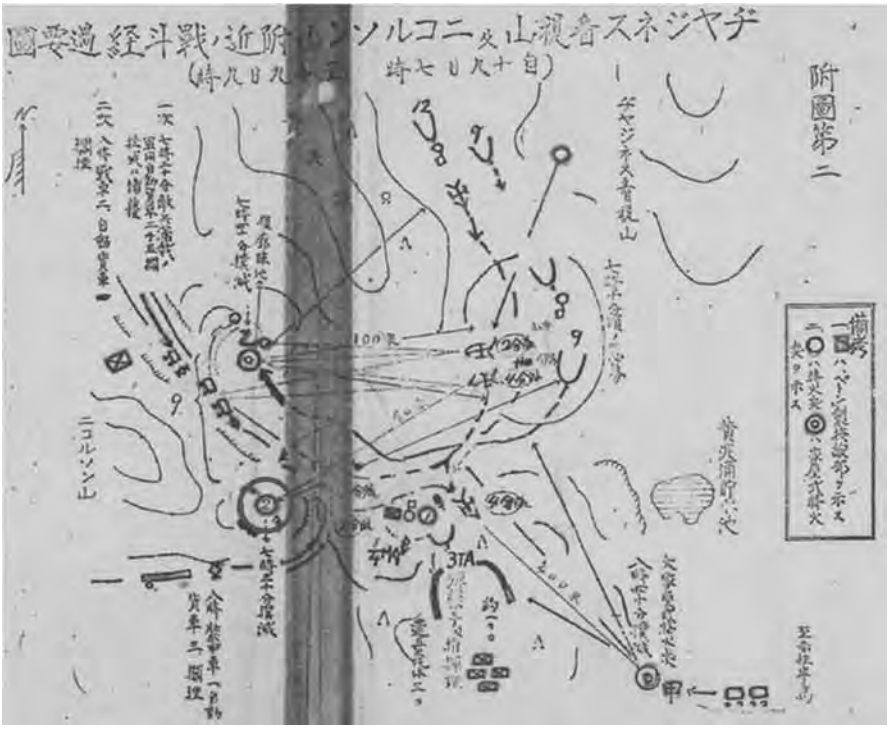


Fig. 4.1

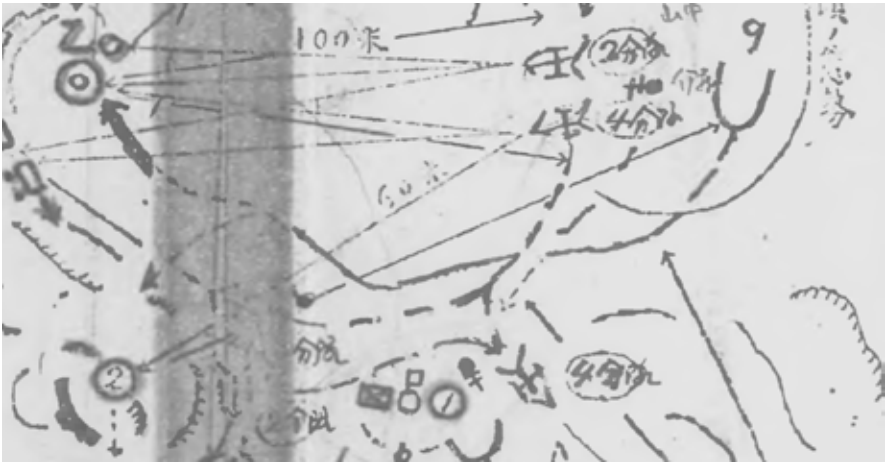


Fig. 4.2

Fig. 4.1 and 4.2: The map in the record of 3rd Coy, 5th Independent Rapid-firing Gun Battalion depicting the early phase of the Battle of Wong Nai Chung Gap. Fig. 4.2 is a magnified version of the "Position One" and "Position Two" mentioned in the Japanese War Diary. Source: "Dokuritsu sokushahō dai go daitai dai san chutai sentō jōhō," RIS, NIDS, JACAR, Ref: C13031807100.

The Japanese account is supported by the evidence found during a site inspection conducted by the authors in April 2013.[15] In all, three groups of battle damage could be identified. First, the eastern embrasure of PB 3 had three identifiable scars (Fig. 5), caused by small calibre guns larger than rifles or automatic weapons. Second, unlike the other two embrasures, the mounting of the Vickers heavy machine gun in the eastern embrasure was destroyed, and only remnants can be seen (Fig. 6). Third, inside PB 3, a shell hole of around 40 cm in diameter can be seen on the western wall of opposite the damaged embrasure (Fig. 7). Four smaller signs of damage were also found nearby. Shrapnel damage can also be seen on the inner sides of the damaged embrasure. Looking out from the pillbox through the damaged embrasure and in front of the damaged wall, one can see the mansion of No. 1 Wong Nai Chung Gap Road, previously the site of the police station, part of Tai Tam Reservoir Road and the end of Sir Cecil's Ride. A straight line can be formed between the police station, the embrasure and the damaged wall, which may suggest that the damage was done by a shell coming from the direction of police station and entering the embrasure. Bullet damage can also be found on the periscope shaft on top of the pillbox.

[15] The author would like to express their gratitude to Mr. Cheung Tsun Lam and Mr. Cheung Kit On, who participated in the excursion and contributed the photographs.

Neither grenade launchers nor mortars could damage the interior of PB 3 in the way that it was damaged. In addition, there were no known mortar units in the area. The Japanese infantrymen were equipped only with grenade launchers that could not hit targets further away than 50m. Thus, the three kinds of damage to PB 3 were more likely caused by flat-trajectory weapons such as the Type 94 gun or heavy machine guns. In addition, the Japanese mentioned that they had aimed at "an embrasure (jū-gan)" and the "pillbox" was "suddenly silenced". However, it was impossible for the two guns of 3/5 IRGB to cause the damage inside PB 3 (the third group of damage) if they fired from the position on Sir Cecil's Ride, as the damage was more likely caused by fire from the direction of the Police Station. This can be explained. The War Diary of 3/5 IRGB noted that after silencing Position Two (PB 3) and the capture of the Police Station by the 9th Coy, the two guns under Yamanaka and Ito were repositioned to the Station and the latter one engaged with the trucks coming from the west and was facing that direction throughout the day.[16] The area near PB 3 changed hands during the next two days. The penetrating round damage could have been caused during this subsequent fighting.

Fig. 5: Damaged eastern embrasure of PB 3

[16] "Dokuritsu sokushahō dai go daitai dai san chutai sentō jōhō," RIS, NIDS, JACAR, Ref: C13031807000.

Fig. 6: Destroyed Vickers MG mounting in PB 3 (Compare with the mounting in Fig. 7)

Fig. 7: Damaged wall behind the attacked embrasure (No similar damage of this size can be found in the pillbox)

POSSIBLE OCCUPANTS OF PB 3

Archival research up till now has not been able to find out the exact occupants of PB 3 in the morning of 19 December 1941. However, there is evidence to suggest that the pillbox might not be unoccupied as Stewart thought. Harold Atkinson, a trooper from 16th Platoon D Coy (Commanded by Lt. Eric Mitchell), 1st Bn Winnipeg Grenadiers, suggested during an interview after the war that he and his platoon had used PB 3 as accommodation right before the Battle. Lt. Mitchell's platoon occupied a "pillbox right on the corner of Wong Nei Chong Gap, right adjacent to the police station" when it was withdrawn from the mainland during the night of 13 December.[17] The platoon, which was later designated as one of the three "Flying Columns" directly commanded by Brig. Lawson, was ordered to move in the evening of the 18th for Jardine's Lookout, but Atkinson did not specify in his account whether there were any stay-behind personnel. Thus, while PB 3 might be occupied by members of D/Winnipeg, the number of its occupants was likely small. As for the weapons available for the occupants of PB 3, the Japanese did not specify whether they were fired on by machineguns or other weapons, and no evidence suggests that there was a Vickers Heavy Machinegun in PB 3 from either sides' sources. In short, detail about the occupants of PB 3 and the weapons they used remains uncertain until more evidence surfaces.

CONCLUSION

Deducing from the damage to PB 3 and the accounts from all sides, it can be established that a brief firefight took place between PB 3 and the 3rd Battalion 230th Regiment and its attached artillery. During the firefight, the Japanese silenced PB 3 by rapid-gun or machinegun fire, or a combination of both. Alternatively, the Japanese could have destroyed the automatic weapon in action in PB 3 (if any) through a direct hit, forcing the defenders to abandon the pillbox. After PB 3 was silenced, the Japanese captured Wong Nai Chong Gap Police Station and establish a position in the southern entrance of the Gap with rapid-firing gun support, keeping all British reinforcements from the south at bay.

This short article illustrates the importance of bringing the Japanese perspective into the discussion of the Battle of Hong Kong using official Japanese records. The Japanese account revealed the fight between PB 3 and 230th Rgt during the early phase of the battle for the Gap, and provided important clues about the action of PB 3 and the fate of its defenders. On the other hand, the surviving British accounts are less clear on PB 3 because those who had written them were not on the spot during the battle. The Japanese accounts are also supported by the GIS and mapping studies over the area around PB 3 as well as site inspections. This article also suggests

[17] "Harold Angus Martin Atkinson: Experiences as a Prisoner of War, WW2," 940.547252. HAR. HKPRO, pp. 10-11.

that the Japanese had no plan to separate the East and West brigades through a thrust towards Wong Nai Chung Gap. However, because of the decision of Col. Shoji, two battalions of 230th Rgt went into the Gap along Sir Cecil's Ride, the only gap in the British line to contain the Japanese advance. The events ensured surprise for both the Japanese and the British. With superior firepower and, more importantly, numerical superiority, the Japanese were able to establish their forces firmly at both the northern and southern entrances of the Gap and seize the initiative for the rest of the battle.

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Surveying & Built Environment

Disposition Effect in the Housing Market – Empirical Evidence from Hong Kong

K.W. Chau[1], S.K. Wong[2], and C.Y. Yiu[3]

ABSTRACT

"Disposition effect" is a term coined by Shefrin and Statman (1985) to denote the tendency of investors to sell winning assets for nominal gains and keep losing assets to avoid nominal losses. More and more empirical studies have confirmed the disposition effect, but most are in securities trading and many are experimentally based rather than based on actual transaction data.

In the housing market, the disposition effect implies lost aversion: homeowners suffering nominal loss tend to hold on to their housing units longer than homeowners with nominal gain. The effect in the housing market can be tested by observing the holding periods of losing and winning transactions. However, empirical tests must control for other factors that may also affect holding periods. This study uses a rich data set to study the disposition effect in Hong Kong's housing market. The result contributes to understanding the factors affecting homeowners' decisions to sell their housing units and helps explain the correlation between price and transaction volume. Evidence of the existence of disposition effect also contributes to testing Kahneman and Tversky's Prospect Theory (1979) explaining phenomena that appear inconsistent with standard economic rationality. The results also have practical implications for practitioners (e.g. real estate agent in targeting potential customers, developers in site assembly and investors in negotiation with sellers) and policy makers (e.g. estimating the time and cost of urban renewal and the mobility of households).

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KEYWORDS

Disposition Effect, Prospect Theory, Housing, Hong Kong

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INTRODUCTION

The disposition effect implies lost aversion and therefore losing homeowners tend to hold on to their housing units longer than winning homeowners. That is the holding period of housing units that are sold at a profit tend to be shorter. The effect can be tested by observing the holding periods of losing and winning transactions. However, other factors also affect holding periods and empirical tests must control for them. First, information asymmetry between owner and seller is likely to increase as the housing unit becomes older due to more possible latent defects of the building structure. Therefore, transactions of older units become less frequent and thus the age of a housing unit would appear to have a positive impact on holding period. Another physical characteristic that may affect information asymmetry is "sea view". Whether or not a unit possess a sea view can be easily observed. Since many previous studies suggest that a sea view is a valuation attribute, buyers and sellers are on a more level playing field for such units. Second, smaller family moving costs are usually lower. For example, single people or young couples without kids are more mobile as they do not need to worry about looking for new schools and can usually adapt to a new neighborhood easily. Concomitantly, extended families with children and/or elderly people are least mobile because of schooling needs and because elderly people are usually more resistant to change. Assuming that larger families live in large units, size may be a positive impact on holding periods. Third, owner occupiers may behave differently to non-occupying owners since the latter do not incur moving costs.

This study is one of the very few to use market data to study disposition effects. The large volume of repeat sales data in Hong Kong allows us to use transaction data to study the disposition effect in Hong Kong's housing market. The result not only contributes to our understanding of the factors that affect homeowners' decisions to sell their units but also helps explain the correlation between price and volume. Evidence of the disposition effect also contributes to testing Kahnemann and Tversky's prospect theory (1979) as an explanation of phenomena that appear inconsistent with standard economic rationality. Beside a homeowner's backward looking behavior, there are other factors that may also affect the timing of his or her decision to sell. Since we need to control for these factors, a side product of this project is to identify and test these additional factors. The result will have practical implications for practitioners (e.g. real estate agent in targeting potential customers, developers in site assembly and investors in negotiation with sellers) and policy makers (e.g. estimation of mobility of families and urban renewal).

LITERATURE REVIEW

"Disposition effect" is a term coined by Shefrin and Statman (1985) to denote the tendency of investors tend to sell winning assets for nominal gains and keep losing assets to avoid nominal losses. Nominal gains or losses are normally measured as the difference between current sale price and the initial purchase price. The interesting feature of the disposition effect is that sale decisions are driven by how much one has gained/lost, rather than how much more one will earn/lose if one chooses to keep the asset.

Many researchers (e.g. Camerer 2001) regard Kahneman and Tversky's (1979) prospect theory, or more specifically, the loss aversion axiom, as one of the most compelling explanations for the disposition effect. This theory basically postulates that 1) people are risk-averse over gains but risk-seeking over losses, and 2) they are more sensitive to losses than gains. While it seems trivial to explain sale decisions by postulating these asymmetric risk attitudes, Barberis and Xiong (2006) analytically show that prospect theory can sometimes lead to results opposite to the disposition effect in a two-period case. So the logical linkage between prospect theory and the disposition effect is not as trivial as it may seem. Tveda (1999) provided other psychological explanations, such as a certainty effect, ego-defensive attitudes, regret theory, mental compartments, cognitive dissonance and over-confidence. Similarly, Nofsinger (2005) regarded the disposition effect as the consequence of avoiding regret and seeking pride among investors. In addition to prospect theory and psychological reasoning, institutional constraints can also result in the disposition effect. In the housing market, for instance, down payments or mortgage repayment are important constraints on sale or purchase decisions. If the asset value falls below the loan value, owners may be less inclined to sell their property in the case of a recourse mortgage loan. Stein's (1995) down payment model has often been used to explain the asymmetric response of trading volume to rising and falling markets.

More and more empirical studies have confirmed the disposition effect, but are mostly in securities trading. The earliest one may be Schlarbaum et al. (1978), who examined 75,000 trades from a national brokerage house in the period 1964 to 1970, and found that investors were quick to sell winners. This result was found well before the term 'disposition effect' was coined. After Shefrin and Statman's (1985) paper on the disposition effect, Ferris et al. (1988) found evidence from the stocks in the NYSE and AMEX markets in the period December 1981 to January 1985. Some experimental studies, such as Weber and Camerer (1998) and Heilmann et al. (2000), also confirmed the disposition effect in experimental securities trading. More recently, Odean (1998) and Grinblatt and Keloharju (2001) further confirmed the disposition effect in more recent stock trading series in the US and Finland, respectively. For example, Odean (1998) studied 10,000 trading accounts from a nationwide discount brokerage in the period 1987 to 1993 and found that investors held losing stocks twenty days longer in median than winning stocks. However, there have been very few studies about the disposition effect in housing markets. Ong (2000) found that the probability of reselling increases as property price increases which is consistent with the prediction

of prospect theory. Genovese and Mayer (2001) studied the disposition effect in the Boston housing market. They found that owners set their asking prices higher when they face a nominal loss (i.e. market price below purchase price). They also showed that a 10% loss on a property would result in a 0.097 to 0.195 percent reduction in the probability that a property is sold in any given week. However, their focus was on the time on the market, i.e. the period between the date of listing and the date of sale. Since listing a property for sale through property agents virtually costs nothing to the owner, the choice of listing date can be quite arbitrary. Owners need not pay any fees as long as transactions do not take place. Moreover, buyers can also search for sellers. When prospective buyers have targeted for specific type of housing, it is quite common for property agents to approach the owner of unlisted property for the buyers. In this case, a transaction can occur without any listing. Because of the problems of using listing dates, we focus on holding periods, i.e. the period between purchase date and sale date, as in other studies on the stock market. In contrast to Grinblatt and Keloharju's (2001) paper on what makes investors trade, this paper aims to study what makes housing owners hold. Neo, Ong and Somerville (2005) suggest the alternative reference point of measuring loss. They found that the relevant reference point for measuring the change in the value function is not the initial nominal purchase price, but rather the highest value. Ong, Sing, and Teo (2007) found that while loss aversion is evident for non-distressed sellers, the effect of equity losses for distressed borrowers is not as clear. Ong, Neo, and Tu (2008) found that there is a disposition effect for non-foreclosure properties, where individual homeowners are reluctant to sell if the sale results in a loss.

RESEARCH DESIGN

We test the disposition effect by examining the factor that affects the holding period (the period between the date of the 1st and 2nd sale of the same property). Since the second sale will realize the loss or gain during the holding period, the existence of the disposition effect implies that the holding period will be longer (shorter) if the second sale realizes a loss (profit). There are, however, other factors that may affect the holding period besides that implied by prospect theory, which need to be controlled.

First, the age of the housing unit may have a positive impact on the holding period since information asymmetry between owner and seller is likely to increase as the housing unit ages due to more possible latent defects in the building structure. The problem of information asymmetry would make any transaction more difficult and thus argue for a longer holding period *ceteris paribus.*

Second, following the same line of argument, a housing unit with a sea view is likely to have a shorter holding period since the attribute of a sea view is valuable and also easily observable. Therefore both seller and buyers have the same information about this attribute. It follows that buyers and sellers are on a more level playing field for such units. That is, the attribute of a sea view may have a negative impact on holding period *ceteris paribus.*

Third, the moving costs of smaller families are usually lower. For example,

single people or young couples without kids are more mobile as they do not need to worry about looking for new schools for their kids and can usually adapt to a new neighborhood easily. On the other hand, extended families with elderly people are least mobile as elderly people are usually more resistant to change. Since information on the size of households is not available, we have to rely on the assumption that that larger families live in large units. On that assumption size may have a positive impact on holding periods.

Fourth, owner occupiers and non-occupying owners may behave differently since the latter does not incur any moving cost. To eliminate sales by non-occupying owners (rented units), we will examine the land search records and eliminate the following transactions from the empirical analysis

(a) units with a lease registered two years before the sale
(b) units held by limited companies
(c) units held by banks (foreclosed properties).

However, this may not eliminate all rented housing units since for some units it is possible that leases are not registered with the land registry. Before 9 July 2004, legislation in Hong Kong protected tenants in limiting rental increases when leases were renewed. More importantly, tenants had the right to renew the lease unless the landlord had legitimate reasons (such as self consumption) not to do so. Therefore most housing units transacted before 9 July 2004 were not rented units. If they were, they would have to have been transacted at lower price levels. Therefore this study will only use data up to 9 July 2004.

Three regression models will be estimated in the empirical analysis. Model 1 is the simple sign effect model which divides winners and losers by means of a dummy variable (as shown in equation (1)) to test whether profit/loss (i.e. sign) imposes a difference in the holding period. In line with the studies in behavioral economics, winners (losers) are defined as the positive (negative) difference between the log selling price P_2 at the second sale t_2 and the log purchase price P_1 at the first sale t_1:

$$HP_i = \phi_0 + \phi_1 L_i + \sum_{j=1}^{J} \beta_j X_j + \sum_{t=1}^{T} \alpha_t D_t + \varepsilon_i \quad (1)$$

Model 1:

where

HP_i is the holding period (in months) between the 1st and 2nd sale (i.e. t_2-t_1);

L_i is a dummy variable which equals 1 if an owner has suffered a nominal loss (i.e. $P_2 - P_1 < 0$) and zero otherwise;

X_j are property characteristics, including building age, sea view and flat size in floor area;

D_t is a series of time dummy variables, which equal 1 if the purchase took place at time t and zero otherwise;

ϕ_1, β_j, α_t are coefficients to be estimated; and

ε_i is a white noise error term.

The coefficient of losers, ϕ_1, tests any sign effect on holding decisions among housing owners. A positive and significant ϕ_1 implies holding the losers longer in housing markets (i.e. supports the disposition effect hypothesis). The coefficients of property characteristics, β_j, test the effects of information asymmetry on the holding period (building age and sea view) and moving cost (flat size as a proxy for family size). Lastly, the coefficients of time dummies, α_t, control the sampling bias resulting from the reduction in the observed holding period as time progresses.

It is possible that the magnitude of loss/gain may also play a role in determining the holding period. This can be tested by Engle and Ng's (1993) joint test for asymmetry of holding period in Model 2 below. This model includes interactive terms of losers' dummy, L_i, and the magnitude of profit/loss, $|p_{2,i} - p_{1,i}|$ as shown in equation (2).

Model 2:

$$HP_i = \phi_0 + \phi_1 L_i + \phi_2 L_i \times |p_{2,i} - p_{1,i}| + \phi_3 (1 - L_i) \times |p_{2,i} - p_{1,i}| + \sum_{j=1}^{J} \beta_j X_j + \sum_{t=1}^{T} \alpha_t D_t + \varepsilon_i \quad (2)$$

where

$p_2 - p_1$ is the difference between sale and purchase log prices (i.e. the extent of loss/gain).

In Model 2, the coefficient ϕ_2 and ϕ_3 test the asymmetry utility function suggested by Prospect Theory. The results are consistent with Prospect Theory if ϕ_2 is significantly larger than ϕ_3.

Model 3:

Finally, the loss dummy L_i may be endogenous if the long term trend of residential prices has been increasing over time. That is the longer the property has been held (larger HP_i), the higher the chance of making a profit ($L_i = 0$). Therefore, a two-stage least squares (2SLS) regression is applied with the Rating and Valuation Department's market wide residential price index as an instrumental variable for predicting L_i.

DATA

We choose transaction records of apartment units in Tai Koo Shing (one of the largest housing estates in Hong Kong) for the construction of the dataset for our empirical analysis for three reasons:

(1) The apartments units in Tai Koo Shing are within the same housing estate with similar design, enjoying the same facilities with similar amenities. The housing estate has 12,698 housing units in 61 residential buildings which are built on a relative small area of approximately 3.5 hectares. The homogeneity of the housing units will minimize the number of factors that need to be controlled in the empirical analysis.

(2) Housing units in Tai Koo Shing are very actively transacted with on average 10% of the total stock changing hands every year. This generates a large volume of data for empirical analysis.

(3) Tai Koo Shing is one of the older housing estates in Hong Kong, completed between 1977-1987. The long history of Tai Koo Shing ensures that there is a large variation in holding periods.

Our data sample consists of 7,186 valid pairs of repeated sales. Summary statistics of the data are shown in Table 1.

Table 1 Summary Statistics of Variables

Variables	Symbols and (Units)	Mean	Std. Dev.	Minimum	Maximum
Holding Period	*HP* (months)	40.53	33.51	0.00	168.00
Selling Price	P_2 (HK$ Million)	4.23	1.92	0.01	19.80
Purchase Price	P_1 (HK$ Million)	3.98	1.83	0.70	16.80
Profit / Loss	$Log(P_2)$-$log(P_1)$	0.06	0.41	-6.41	1.50
Age	*AGE* (months)	202.23	59.26	54.00	341.00
Floor	*FLR (No.)*	14.77	7.75	1.00	30.00
Gross Floor Area	*GFA* (Square Feet)	798.86	167.29	350.00	1,408.00
Full Seaview	*FSV* (dummy)	705.00			
No. of Pairs of Repeated Sales	*N*	7,186.00			

The average holding periods are very different when owners are making a profit or a loss. For example, losers held about 58 months on average in the estate, while winners held 31 months. The average difference amounts to 27 months between winners and losers. In addition, the number of transactions for losers is less than that for winners (there are 2,542 transactions making losses ($P_2 - P_1 < 0$), and 4,644 transactions making profits), which agrees with the prediction of the behavioral model of avoiding regret and seeking pride.

EMPIRICAL RESULTS

Table 2 shows the results of running Models 1 and 2.

Table 2 Empirical Results of Models 1 and 2

MODELS 1 and 2				
Dependent Variable: Holding Period (in Months), $t_{2,i} - t_{1.i}$				
Method: Least Squares Included observations: 6,945				
	MODEL 1		MODEL 2	
Variable	Coefficient	P-value	Coefficient	P-value
ϕ_0	-46.6908	0.0000	-48.34927	0.0000
L_i	23.6046	0.0000		
$L_i \times \lvert log\ P_{2,i} - log\ P_{1,i} \rvert$	-	-	38.64839	0.0000
$(1-L_i) \times \lvert log\ P_{2,i} - log\ P_{1,i} \rvert$	-	-	-6.313615	0.0000
AGE	0.3886	0.0000	0.412709	0.0000
FLR	0.0225	0.5201	0.034976	0.3300
GFA	0.0467	0.0000	0.048205	0.0000
SV	-9.4386	0.0000	-9.307211	0.0000
Time dummy coefficients are omitted here				
Adjusted R-squared	0.5901			

Firstly, the results confirm the disposition effects in both models; namely that owners hold 19-23 months longer for transactions making losses in comparison with making profits. Both sign and size effects are statistically significant. However, loss-making transactions, though imposing a positive impact on holding periods, have a different strength in comparison with profit-making transactions. The size effect of losses is almost three times stronger than that of profits.

Other housing characteristics also have significant impact on the holding period. For example, AGE, GFA and FLR have a positive effect on the holding period, although FLR is not significant. A full seaview, on the contrary, has a negative effect. The results agree with Akerlof's lemon postulation that high quality products are more unlikely to be traded due to asymmetric information between owners and potential buyers. The positive sign of GFA can also be explained by the higher moving costs of a larger family.

Table 3 shows the results of Model 3 (2SLS Model). After taking into account general market trends, the disposition effect becomes more serious. Losing transactions in the estate were held, on average, 35 months longer than profitable transactions. The size effects between profit and loss, however, are closer. Results of other variables are similar to Model 2, although the insignificant variable FLR has changed sign.

Table 3 Empirical Results of Model 3

Dependent Variable: HP				
Method: Two-Stage Least Squares				
Sample: 1 15235 IF SALE_NO>0 AND ROOF=0				
Included observations: 6945				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ϕ_0	-45.0930	5.3049	-8.5003	0.0000
$L_i \times \lvert log\ P_{2,i} - logP_{1,i} \rvert$	34.8772	3.2131	10.8548	0.0000
$(1-L_i) \times \lvert log\ P_{2,i} - logP_{1,i} \rvert$	28.8474	2.2624	12.7507	0.0000
AGE	0.3219	0.0063	50.8639	0.0000
FLR	-0.0014	0.0365	-0.0378	0.9699
GFA	0.0384	0.0024	15.7125	0.0000
FSV	-7.7473	1.3133	-5.8990	0.0000
PSV	4.8237	1.2940	3.7279	0.0002

Instrument list: C RVD_OLD>RVD_NOW
(RVD_OLD>RVD_NOW)
*ABS(LOG(RVD_NOW/RVD_OLD)) (1-(RVD_OLD>RVD_NOW))
*ABS(LOG(RVD_NOW/RVD_OLD)) AGE FLR GFA PSV FSV

It requires sufficient profit to compensate for moving costs before trading houses. Table 4 shows the results of relaxing the assumption of the purchasing price as the reference point. The higher moving costs are considered, the smaller the difference in holding period between winners and losers. This provides a good candidate for further study on the reference point of disposition effects.

Table 4 Reference Points and Holding Period Difference

Model 1	10% moving costs	20% moving costs	30% moving costs
ϕ_1	14.8783	8.8683	4.8292

CONCLUSIONS

We tested prospect theory with real estate market data. The results suggest that house owners' decisions to sell or hold their housing units are affected by the purchase price of their units. After controlling the factors that may affect how long a household will hold their house, there is strong evidence that house owners are less willing to sell if they lose money after selling the units but more ready to sell if the selling price is higher than their original purchase price (which is sunk cost). This backward looking rather than forward looking behavior in making a decision to sell a housing unit is seemingly irrational and not in line with standard rationality assumptions in economics but is, however, in line with the prediction of prospect theory. In addition, we found that smaller households are more mobile; older units are more difficult to sell due information asymmetry and, likewise, units with less information asymmetry, such as those with sea views, are more liquid.

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