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THE UNIVERSITY OF HONG KONG

TWO TYPES OF DEVELOPMENT APPLICATION:

AN EMPIRICAL TALE

A DISSERTATION SUBMITTED TO

THE FACULTY OF ARCHITECTURE IN

CANDIDACY FOR THE DEGREE OF

BACHELOR OF SCIENCE IN SURVEYING

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION

SHA YAN YI, JANICE

HONG KONG

APRIL 2009

DECLARATION

I declared that this dissertation represents my own work, except where due acknowledgement is made, and it has not been previously included in thesis, dissertation, or report submitted to this University or any other institution for a degree, diploma or other qualification.

Signed   : _____

Name   : _____Sha Yan Yi, Janice_____

Date   : _____April, 2009_____

Witness by : _____

(Professor Lawrence Wai-Chung Lai)

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Janice Sha

April 2009

Hong Kong

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ABSTRACT

As a first attempt to extend the ideas and probit modeling research of Lai and Ho (2001a, b, c; 2002a, c; 2003), Chau and Lai (2004) and the B.Sc. and doctoral students of Lai, including Yung (2001), Ngai (2002), Chan (2003), Yu (2003), Chau and Lai (2004), Chan (2004), Kou (2004), Wan (2004), Ip (2005), Kwok (2005) and Li (2006), this dissertation investigates the congruence or otherwise between the pattern of decisions for s12a and s16 applications under the provision of the Town Planning Ordinance.

The s12a and s16 applications were made by developers respectively for permission for rezoning and planning applications. Five empirical hypotheses in relations to rezoning and planning applications under Green Belt zoning in Hong Kong were tested, using non-aggregate development control statistics of 95 and 1031 sets of observations with respect to Green Belt Zones in Hong Kong from 1 January 1998 to 9 March 2009, respectively for s12a and s16 applications.

The hypotheses were tested in relation to the preference of the Town Planning Board (TPB) for degree of urbanization of the application sites, the size of the proposed development and different types of applied uses.

Results showed that location, development scale and types of use are statistically speaking significant factors in shaping the decisions of the TPB when vetting planning applications but insignificant in handling s12 applications' decisions. Thus, it is concluded that the decisions on s12a applications were driven probably by some other factors not observed. The concern of s12a applications with s16 one can only be described as non contradictory rather than compatible.

Table i - <u>Summary of hypotheses, test results and implications</u>

Hypotheses Regarding Development Applications for Uses in Green Belt Zones	Test Results	Theoretical/ Policy Implications	Consistency Implications
I. All development applications made under s12a and s16 of TPO in sub-urban and rural areas are associated with lesser chance of being approved than those in old urban regions. a) rezoning applications b) planning applications	 - Hypothesis is not yet refuted. - Hypothesis is not yet refuted.	Old urbanized areas appeared to stand a higher chance to be approved than the sub-urban or even rural areas.	Consistent
II. Both planning permission and rezoning approval decisions in respect of all uses in GB zones show no preference on the larger development. a) rezoning applications b) planning applications	 - Hypothesis is not yet refuted. - Hypothesis is refuted.	Decision-makers may be affected by rent-seekers in the consideration of planning permission as they prefer larger development. The decisions are go against the "limited development" planning policies.	Not contradictory

III. The probability of obtaining planning permission and rezoning approval for the development of VTH in the GB Zones would be greater than applying for ordinary residential development.		TPB treats development applications for different uses in an asymmetric manner that preferring VTH to ordinary residential development.	Consistent
a) rezoning applications	- Hypothesis is not yet refuted. It is more difficult to obtain rezoning approval for RES zones.		
b) planning applications	- Hypothesis is not yet refuted. It is easier to obtain planning permission for VTH development.		
IV. Applying for public uses which are provided for promoting general public benefit are always associated with a greater chance of getting approval, regardless the proposal is submitted under s12a or s16 of TPO.		TPB relies on the "promoting public benefit" planning policy in considering planning application but uphold the "presumption against development" intention in determining rezoning applications.	Not contradictory
a) rezoning applications	- Hypothesis is refuted.		
b) planning applications	- Hypothesis is not yet refuted		

V. Applying for unproductive private uses is related to a lower chance of getting planning permission as well as rezoning approval.		N/A	N/A
a) rezoning applications	- Hypothesis is left untested		
b) planning applications	- Hypothesis is refuted		

Table ii - <u>Probit analysis of decision function (s12a applications in Green Belt Zones)</u>

Zone	N	β_0	NT	SA	DATE	VTH	RES	GIC + OS + ROAD	STO	Log - Likelihood	Percentage correct prediction
GB	906	-0.16418* (2.70833)	-0.54547* (-2.88982)	2.2E-06*** (1.72860)	0.04611 (0.50472)	0.35174** (2.45110)	0.17238 (1.07512)	0.28297** (2.08270)	-0.16418 (-0.96868)	-583.876	26.89%

* Statistically significant at 1% confidence level   ** Statistically significant at 5% confidence level

*** Statistically significant at 10% confidence level

Table iii - <u>Probit analysis of decision function (s16 applications in Green Belt Zones)</u>

Zone	N	β_0	NT	SA	DATE	VTH	RES	GIC + OS + ROAD	STO	Log - Likelihood	Percentage correct prediction
GB	39	2.69736 (1.90394)	-3.23902* (-2.88982)	6.22E-06 (1.55117)	-1.40347 (-1.52614)	1.05297 (0.98560)	-1.53411** (-1.79790)	-0.41184 (-0.78665)	N/A	-13.0532	43.74%

* Statistically significant at 1% confidence level   ** Statistically significant at 10% confidence level

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LIST OF ABBREVIATIONS

C/R   Commercial/ Residential Uses

DPA   Development Permission Areas

GB   Green Belt

GFA   Gross Floor Area

GIC   Government, Institution and Community

HK   Hong Kong Island

HKPSG   Hong Kong Planning and Standard Guidelines

I   Industrial

KLN   Kowloon Peninsula

LSE   Least Squares Estimation

MLE   Maximum Likelihood Estimation

NT   New Territories

OI   Outlying Islands

OS   Open Space

OST   Open Storage

OZP   Outline Zoning Plans

PUI	Public Utility Installations
RES	Ordinary Residential Development
SA	Site Area
SSSI	Site of Specific Science Interest
TPB	Town Planning Board
TPO	Town Planning Ordinance
U	Undetermined Uses
VTD	Village Type Development
VTH	Village Type House

CHAPTER I

INTRODUCTION

What is Town Planning?

Conventionally, according to Dror, planning is defined as 'the process of preparing a set of decisions for action in the future directed at achieving goals by optimal means.' (Jarvie and Agassi 1969, 162)

Planning involves making and evaluating each of a set of interrelated decisions before action is taken, in a circumstance that unless certain action is taken, a desired future state is not likely to occur, and that if proper action is gone through, the likelihood of a favorable outcome can be augmented. (Bristow 1984) Planning is always suitable to put into different aspects of our lives to achieve a better future while planning in this paper refer to town planning, which is concerned with the use of land.

Towns and cities are neither God-given nor 'natural'. (Greed 1996) Formation of cities is a "corollary development" (Branch 1985) in the man's social evolution where a majority of people crowded together in a settlement in which urbanization turned up. The Industrial Revolution in 1840s, a remarkable turning point to the world, led to a vast change in the world economy, from agrarian to industrial and commercial, facilitating the pace of urbanization and growth of cities.

However, associated problems also arose from the rapid expansion of cities. An enormous growth of urban population, especially derived from rural-urban migration, result in an abnormal high density of development and overcrowding in cities under the constraint of limited land resources. Hence, town planning is necessary to optimize total social benefit generated from an overall efficient use of land.

"Town Planning is the art and the science of ordering the land-uses and sitting the buildings and communication routes so as to secure the maximum level of economy, convenience and beauty."

(Keeble 1952, 37)

Town Planning is a profession dealing with the techniques, activities, procedures, and management of government intervention in spatial and socioeconomic affairs in terms of policy issues of the concern over efficiency in resource allocation in the presence of "market failure". (Lai 1997, 2) It is not a straightforward subject which provides a definite answer or a fixed set of rules. (Department of Environment 1972) Instead, it subjectively depends on what one wants to achieve and how one want to live.

Town planning process helps to define what the community sees as appropriate uses of land and provides ways to ensure land is used in a proper way (Civic Exchange 2006) so to achieve the most beneficial land uses for the provision of a quality living environment, facilitating the economic development and advancing the "health,

safety, convenience and general welfare of the community"[1] by

means of guiding and controlling development and the use of land.

Such a government regulatory activity is often justified on the

grounds of social benefit or public interest. (Lai 1997)   The

objectives of town planning seem to be equivalent to the "social

welfare function" in welfare economies as justified by the Pigovian

microeconomics. (Lai 1997)   On the other hand, town planning also

mean a regulation on the use of the land.   For this, some may suspect

that town planning is a trade-off of private property rights in the name

of public interest.

Undoubtedly, the town planning system is tilted towards public

interest and overwhelms private rights.   However, as Roger Bristow

argued, the land market is imperfect and planning can help to

minimize transaction cost.   On condition that it is effective and

efficient by getting sufficient public participation and enforceable

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[1] Town Planning (Amendment) Ordinance, Chapter 131, Laws of Hong Kong

planning control, a comprehensive town planning can always give some certainty to landowners and residents as to what will happen in their neighborhood and it can be said as a protection for private rights to some extent.

Town planning Framework in Hong Kong

A more precise description of town planning in Hong Kong should be "land-use planning" (Bristow 1984). It represents an administrative process of (re)designing the environment. It also implies the government intervention in regulating environmental changes, principally through influencing the development process in order to ensure adequate forward planning policies and development control mechanisms are given to meet the social and community needs. By these means it seeks to achieve the objective which is: "to promote the health, safety, convenience and general welfare of the community" as declared in the Hong Kong Town Planning

Ordinance[2] (TPO).

Forward planning is a process that the government planning assigns property rights over land while the assigned property rights will be enforced by the government planner through the process of development control. (Lai 1997) These can be verified by the existing town planning system. Currently, the town planning system is functioning on two separate levels: the administrative planning system and the statutory planning system.

The administrative planning system is an internal government system used to create broad plans and detailed layout of some specific area. Territorial and sub-regional development strategy and districts plans are produced at this level by the Planning Department, which is the major administrative and executive body for land use planning and control. The plans drafted in this planning system are non-statutory nature.

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[2] Town Planning (Amendment) Ordinance, Chapter 131, Laws of Hong Kong

The Administrative Planning System

Territorial Development Strategy and the "Hong Kong 2030 Study"

Sub-regional Development Strategies (e.g. Metroplan, Lantau Concept Plan)

District

Broad planning aspects

More detailed planning aspects
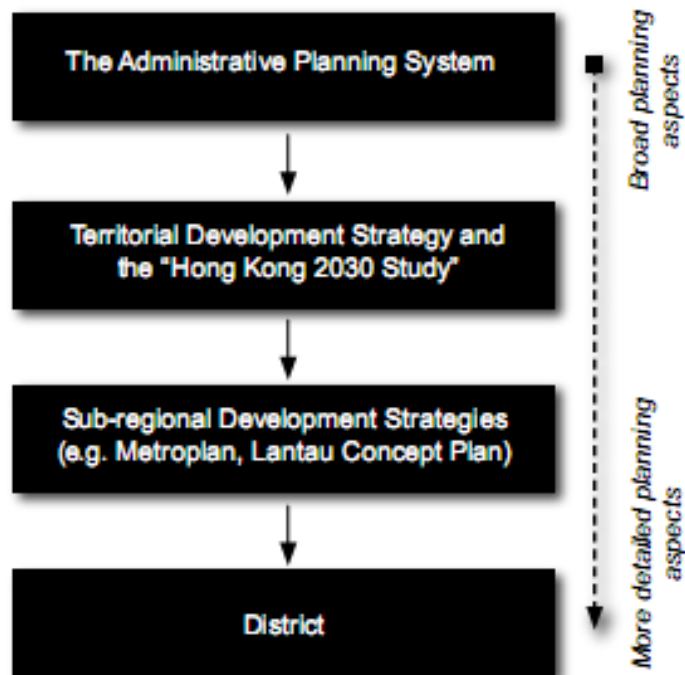
(Source: Civic Exchange 2006)

Chart 1 – Levels of planning within Administrative Planning System

While for the statutory planning system, it is empowered by the TPO. Under the TPO, statutory plans, including the Outline Zoning Plans (OZPs) and Development Permission Area Plans (DPA plans) (which are prepared for the areas in New Territories and will be replaces by OZP ultimately), are published by the Town Planning Board (TPB).

Chart 2 – <u>Different types of statutory plans within Statutory Planning System</u>

Both types of statutory plan indicated what is intended to be planned in a district and all public and private developments must be in accordance with the plans. As the plans are published in the Government Gazette, the public is able to know what can be done within their own land, provided that the land is covered by a plan.

Generally, Hong Kong is divided into 6 different sub-regions[3] and 119 areas for preparing plans. Each area is zoned for various

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[3] They are (1) Hong Kong Island, (2) Kowloon, (3) Sai Kung and Islands, (4) Sha Tin, Tai Po and North, (5) Tsuen Wan and Kwai Tsing and (6) Tuen Mun and Yuen Long.

defined uses as shown in the annotated zoning map, and (re)developments within the zones are restricted to them. Other than those uses which are always permitted as marked in the Plans, planning permission must be applied before the realization of the development proposal.

For the institutional framework of the town planning in Hong Kong, basically, the TPB is authorized to handle all the land usen planning matters. It is a statutory body performing specific planning functions through delegated authority under the TPO from the Chief Executive-in-Council. It is mandated to prepare draft plans and granting the planning permission for (re)developments in the urban areas.

The Planning Department is the executive arm of the TPB. It is responsible for creating, monitoring and reviewing town plans, planning policies and associated programmes for the physical development of Hong Kong. It acts on behalf of the TPB to create

draft plans.

Other government or non-government bodies will also involve in the town planning process by providing technical advice to the TPB on matters such as transport, environment, engineering and land administration.

The Evolution of the Town Planning Ordinance

"To promote the health, safety, convenience and general welfare of the community by making provision for the systematic preparation and approval of plans for the lay-out of areas of Hong Kong as well as for the types of building suitable for erection therein and for the preparation and approval of plans for areas within which permission is required for development."

Long title of the Town Planning

(Amendment) Ordinance 2005

Town Planning in Hong Kong is greatly influenced by the British Town Country Planning Act of 1932 (Bristow 1984) as Hong

Kong Island had been a British Crown Colony since 1842 under the Treaty of Nanking and later the Kowloon Peninsula also since 1860 under the Convention of Peking. It is inaugurated with the enactment of the first piece of legislation related to town planning. The TPO was legislated in 1939, but due to the Second World War (1939-1945), it was not brought into effect until 1947 and the first meeting of the TPB was only convened in 1951.

At the establishment, the initial mission of the Governor appointed to the TPB solely was to prepare draft plans for the future layout of existing and potential urban areas, based on the aim "to promote the health, safety, convenience and general welfare of the community" as declared in the Ordinance

After undergoing a series of evolutions of the town planning and policies, and in concert with various amendments to the TPO, the planning and development of the land in Hong Kong are now jointly managed by the TPB and Planning Department. The Town Planning

(Amendment) Ordinance runs to twenty-six sections from fourteen sections and contains provisions dealing with different planning aspects such as the making of plans, planning permission and enforcement for the whole territory.

There are continuous additions and alternations to the TPO, or rather, there are three major turning points which constitute the current Ordinance. There was no major change to the TPO after its enactment until the first turning point in 1974, when the provisions for the operation of a planning application system were integrated into the TPO.

In 1974, two sections, the Section 16 and 17, are introduced to outline the procedures for obtaining planning permission from the TPB in case of the proposed developments fall outside the permissible uses in the column 1 of it belonged zonings in the related OZPs. The two sections are for planning application and planning review respectively. In case of a refusal of the planning permission

by the TPB, the applicants may apply to the Board for a final review

of its decision according to the s17.   These processes are vitally

important for the land holders to grasp the development rights of their

land which are strictly limited by the statutory plans.

A further progression of the planning application system was

made by setting up the Town Planning Appeal Board in 1991, which

is added into s17a of the Ordinance.   By the section, applicants can

now appeal to the Appeal Board for the disagreement to the decision

of the TPB in respect to his planning application.

Apart from the introduction of the appeal system, the 1991

amendment empowered the TPB to makes plans for any areas of

Hong Kong, no matter it is urban or rural land.   Also, the amended

ordinance implemented a direct enforcement provisions into it.

Regarding to the section 23 of the Ordinance, the Authority, the

Director of Planning, may issue an enforcement notice, a stop notice

or a reinstatement notice in respect of an unauthorized development

under the Development Permission Area (DPA) Plan. It is an offence if the land holders do not comply with the notices. However, the areas which are governed by OZPs without a history of DPA plans are not under control of the Section and they are still rely on the indirect enforcement provided by the s16(1)(d) of the Building Ordinance, which has already come into effect in 1959.

Subjecting to the problem of "black box operation" and little public involvement in the planning system in Hong Kong, there was an intention to prepare a new piece of town planning legislation. Hence, the recent and revolutionary amendment to the TPO was brought by the Town Planning (Amendment) Bill in 2003 after the public consultation in 1996, which contributed to the Town Planning (Amendment) Ordinance in 2005.

In order to enhance the openness and transparency of the planning procedures and planning application system, as well as strengthen the planning enforcement control against unauthorized

developments, the Town Planning (Amendment) Bill was introduced into the Legislative Council for the revision of the .   Regarding to the Bill, the formulate and emend the Ordinances are:

i.   To expedite the plan-making process

ii. To streamline the planning approval process

iii. To enhance the transparency of the planning system

iv. To recover costs for processing planning applications

v. To strengthen enforcement control against unauthorized developments not permitted under the Ordinance

So as to hasten the plan making process, it was proposed to standardize the plan making process by regulating the plan exhibition period, hearing, approval, amendment and replacement process as explicitly stated in law.   Also, public participation in the plan making process is encouraged by allowing applications for amendment of plans and to planning permissions so as to enhance the efficiency of the Board for streaming the planning approval process.

For this, the section 12 is formulated to permit the public to apply for amending the statutory plans.

Moreover, no matter whether applications for planning permission are made under section 16 and 17 or amendment of plan under section 12, three weeks of public comments must be provided to invite public involvement and improve the transparency of the planning system.

Rezoning and Planning Applications

Under the Town Planning (Amendment) Ordinance, the planning system now allows two kinds of development applications under s12 and s16. Notwithstanding that both are adopted by the developers in seeking to change land uses for (re)development, the two systems are fundamentally different in nature.

S12a Rezoning Applications

Any zoning or other restrictions explicitly stated in the statutory plans, include the OZPs and DPA Plans, must be strictly followed. If anyone is not acted according to the Plans, (s)he is offending the law of Hong Kong.   However, the uses or restrictions set out in the Plans may be deemed obsolescent and inappropriate for use. They may not be the optimum use of the land, and hence, restricting the potential of the land for (re)development.   Under the provisions of section 12(a) of TPO, the general public, include any person or organizations, can propose changes to the draft Plan, DPA Plan and Approved OZP anytime when (s)he considers it is needed. It is a proposal for altering the development restrictions stated in the statutory plans, which include applications for rezoning and tightening or loosening the control parameters such as plot ratio and height restriction specified in the Notes of the Plans.

Therefore, some developers, who are also members of the public, may make use of the s12(a) of the Ordinance to apply for

changing land use of a piece of land if the proposed use does not fall within any zones that specify in the Plan.

In fact, as the intention of s12a applications is not aimed at (re)development of a particular area, the TPB will not approve specific developments under the Section, unless it is related to the overall land uses or general parameter.

S16 Planning Applications

Even the proposed (re)development is a coincidence of the zoning drawn on the Plans, the developer or land lease holders may still need to obtain planning permission. There are some uses always permitted as specified in Column 1 in the set of "Note" in the Plans while uses fall into the Column 2 are required to get the approval from the TPB.

If the proposed uses of the planned development fall into the Column 2 of the Plan or as is required under the "Remarks" section of

the Notes in the Plans, the developers need to apply to the TPB under

Section 16 of the TPO even the land lease permits the uses. The

Board will base on the individual merits for each case to deliberate

granting approval (with or without conditions) or not within 3 months,

which is similar to the application process of S12A applications.

In case of rejection by the TPB, the S16 applicants may process

forward to the planning review and appeal under the section 17(a)

and 17(b) of the TPO respectively.

Amendment of Plan (s.12A)

Applicant to obtain the *consent* of or *notify* the "current land owner" of the application site; or take reasonable steps to do so

Planning Permission (s.16)

Applicant to obtain the *consent* of or *notify* the "current land owner" of the application site; or take reasonable steps to do so

TPB receives the application and the prescribed application fee

TPB to *publish* the application for *3 weeks* for *public inspection and comments*

TPB to *publish* the application for *3 weeks* for *public inspection and comments*

TPB to hold a meeting to consider the application

TPB to hold a meeting to consider the application; the applicant may *attend and be heard*

Applicant may apply for a review under s.17 if he is not satisfied with the TPB's decision

TPB to *publish* the application for *3 weeks* for *public inspection and comments*

TPB to hold a meeting to consider the review application; the applicant may attend and be heard

If TPB *accepts* the proposed amendment *in whole or in part*, the amendment will be incorporated into a draft plan for exhibition in accordance with the provisions of the Town Planning Ordinance

Applicant may appeal the decision to the Town Planning Appeal Board under s.17B if still not satisfied with the decision

3 months *2 months* *3 months*

(Source: "Town Planning Annual Report 2004", Town Planning Board)

Chart 3 – <u>Procedures for processing Application for Amendment of</u>

<u>Plan and Planning Permission</u>

Research Context

This dissertation is a logical extension of the prior research on planning applications and zone separation in Hong Kong by Tang and Tang (1999), Tang and Choy (2000), Tang, Choy and Wat (2000) using Logit models and Lai and Ho (2001a, b, c; 2002a, c; 2003), Yung (2001), Ngai (2002), Chan (2003), Yu (2003), Chau and Lai (2004), Chan (2004), Kou (2004), Wan (2004), Ip (2005), Kwok (2005) and Li (2006) using Probit models.

Such research covers (1) identification of factors for predicting success in planning applications, (2) measurement of zone separation, (3) assessment of the effectiveness of the planning system in tackling externalities, (4) verification of economic theories of the behavior of planning authorities and (5) evaluation of public participation.

Table 1– <u>Summary of previous s16 applications research</u>

	Author	Tested Zonings	Implication (Category)	Methodology
1	Tang and Tang (1999)	C/R, I, R(A), R(B), R(C)	Proposed residential development with a larger gross site area is associated with a greater likelihood of being approved. (1)	Logit model
2	Tang and Choy (2000)	R(A)	The chance of get approval for commercial-office development in R(A) zone is affected by the proposed development scale, number of previous attempt, timing of decisions and existing market supply. (1)	Logit model
3	Tang, Choy and Wat (2000)	R(A)	The chance of get approval for commercial-office development in R(A) zone is positively affected by provision of loading facilities, frontage, distance to MTR station and previous attempt; negatively affected by provision of car-parking facilities and larger development. (1)	Logit model
4	Lai and Ho (2001a)	GB	The building-free "green belt policy" made a big concession to the "small house policy". (1)	Probit Model

5	Lai and Ho (2001b)	R(A), R(B), R(C)	No significant rent-seeking activities are found in the TPB's decision on planning permission in the residential zones. (1)	Probit Model
6	Lai and Ho (2001c)	GB, U	TPB tends to rejected proposal applied for larger development scale in GB and U zones. (1)	Probit Model
7	Lai and Ho (2001d)	CDA, C/R, GIC	The similar and dissimilar zones with identical uses are in fact similar in considering the planning application of the common column 2 uses. (2)	Probit Model
8	Yung (2001)*	CDA, R(A), R(B), OU(CRA)	Site area, demand for and supply of hotel rooms and zonings are significant to affect the planning permission for hotel development. (1)	Probit Model
9	Lai and Ho (2002a)	I	The probabilities of applying for office uses in I zones are dependent on the rise and fall of the manufacturing factors. (1)	Probit Model

10	Lai and Ho (2002c)	STO	The planning permission system is market and size neutral towards the container-related uses. (1)	Probit Model
11	Chiu (2002)*	RES	No rent-seeking activities are found in the planning decision of the TPB. The current planning system does not provide certainty and reduce negative externalities. (3, 4)	Probit Model
12	Ngai (2002)*	AGR	TPB prefers VTH uses but bias to STO uses in AGR Zones. It does not show any preference to the container uses nor larger development in the decision of s16 applications. (1)	Probit Model
13	Kwan (2002)*	I(D), U	I(D) and U zones are inseparable with respect to industrial use. (2)	Probit Model
14	Lai and Ho (2003)	CDA, GIC, GB	TPB is not responsive to exogenous territory-wide housing policy for planning applications in CDA, GIC and GD zones. Rent-seeking activities are found in the planning permission mechanisms in CDA zones. (1)	Probit Model

15	Chan (2003)*	AGR	TPB prefers the VTH uses and larger development in AGR Zones. The planning decisions is also affected by the site accessibility and the overall economic environment of Hong Kong. (1)	Probit Model
16	Liu (2003)*	STO, U	TPB's planning decision on STO and U Zones are found to be anti-market. The two uses are inseparable in with respect to container-related uses but separable with respect to non-container-related uses. (2)	Probit Model
17	Yu (2003)*	CA, CPA, GB, SSSI, REC, RPA	Applying for community or utility uses in recreation and conservation related zones are related to higher likelihood to be obtained planning approval. The planning decisions are in accordance with the planning intention to be more likely to reject the use which generate adverse environmental impacts in the tested zones. (1).	Probit Model
18	Chau and Lai (2004)	AGR	TPB has shown a dislike for large-scale development and applications in Sai Kung in regard to s16 applications while a preference for the small house development in AGR zones. (1)	Probit Model
19	Yung (2004)**	AGR, CA, CDA, C/R, CPA, GB, GIC, I, I(D), OS, OST, RES, REC, SSSI, U, VTD	The similar and dissimilar zones with identical uses are non-separable in considering the planning application of the common column 2 uses. (2)	Probit Model

20	Chan (2004)*	I(D), R(D), STO	STO zones and [I(D) and R(D)] zones are separable with respect to open storage uses. For STO Zones, warehouse and open storage uses are more likely to be approved than non-open storage use. Larger sites for open storage uses are more likely to be approved. (1, 2)	Probit Model
21	Kou (2004)*	Mai Po Buffer Zones	TPB is generally against development in the Mai Po Buffer Zones. But large development is not easier to be rejected within the Zones. Location also do matter, planning application in Buffer Zone 2 is more likely to be approved than Zone 1. (1)	Probit Model
22	Wan (2004)*	I, OU, OU(B)	Uses, location and exogenous policies are decisive factors which will affect the planning decision of TPB. But development scale is not a concern to the TPB. (1)	Probit Model
23	Lai and Chan (2005)	RES	Older urban estates with fewer owners are more likely to form owners' corporations (OC) as described by Mancur Olson's group theory. (N/A)	Probit Model
24	Ip (2005)*	GB	Degree of urbanization, development scale and types of applied use are influential in vetting planning applications in GB Zones of New Town. (1)	Probit Model

25	Kwok (2005)*	I, OU(B)	I and OU(B) Zones are inseparable with respect to commercial and office uses. Planning applications in Sha Tin and applied for residential or office uses tend to have a higher chance to be approved for the two test zones, regardless of the development size. (1, 2)	Probit Model
26	Chan (2006)*	C, CDA, C/R, GIC, R(A), R(B), R(C), R(E), VTD, OU	The lower percentage the request of the development restriction relaxation, including GFA, plot ratio, height restriction and site coverage imposed by the OZP, the higher change to get planning approval. (1, 4)	Probit Model
27	Li (2006)*	I	The applied uses and current market situation will affect the TPB's planning decision, regardless of the site scale and location. (1)	Probit Model
28	Ng (2006)*	CDA	TPB are insensitive the location, degree of urbanization of the site, applicants and exogenous policies in considering planning application in CDA Zones. Rent seeking activities are revealed from the planning decision of TPB in the Zones. (1, 4)	Probit Model

*   The paper is unpublished undergraduate thesis from The University of Hong Kong

**   The paper is unpublished postgraduate thesis from The University of Hong Kong

This dissertation takes one step further by examining the s12a rezoning application in addition to s16 applications for the GB Zones to check whether there are any factors affecting success rates in seeking the s12a and s16 applications approvals.

On top of that, it is anticipated that s16 applications should be approved more easily than rezoning requests. The logic is that s16 applications are asking for permission for uses specified under the Column 2 in the Note of the Plan. In other words, the uses are already allowed in the existing plans, subjected to the approval with or without conditions by the determination of the Board. On the other hand, rezoning is applying for uses out of the consideration in the original zoning plans. It represents a larger extent of interruption to the original plan and creating greater incompatible impact to the neighboring area compared with the use applied in s16 applications.

Nevertheless, in 2002, there is a case of a developer whose application had been rejected to build a hotel on the Industrial zone in

Tsuen Wan under the S16 application.   The developers then made a

second attempt through s12a applications and the Board granted an

approval to the same proposal in name of rezoning

The public can have no idea as to how the TPB can arrive at

such an apparently illogical decision in that the same proposal can

obtain two contradictory decisions under the two development

application systems.

As there is no explicit administrative nor statutory guideline

for the decision of the TPB on the planning and rezoning applications,

there is a research gap to study if there is any relationship between

the decisions for the two kinds of planning applications from the

"black-box operation" of the Board.

Objectives of the Study

This dissertation seeks to:

    i. scrutinize the current institutional/ legal framework for planning applications

    ii. investigate the intention and aspiration of zoning policies

    iii. dissect the factors in the rezoning and planning permission proposal which contribute to the success or failure of the applications,

    iv. verify the compatibility of the TPB's decision between s12a and s16 applications

    v. examine the use of development control data

    vi. develop a model for evaluating and analyzing the data

Significance of the Study

Till now, there is no study focusing on s12a rezoning applications. At the same time, more developers seek to use the rezoning mechanism as a second attempt to get approval for development after the failure of the s16 applications. Hence, there is a need to evaluate the s12a applications after s16 one. This dissertation tries to make a start in identifying the factors for predicting success in rezoning applications. It will also measure the separation between the two types of development applications and to point out a weakness in the development application mechanism.

Moreover, the study asks for a system review so as to reduce transaction cost of redevelopment, give some kind of certainty to the private property rights of land and facilitate a better planning of the community in order to achieve the goal of maximizing economic and social welfare.

Framework of the dissertation

The dissertation will be divided into five chapters.   Following this introduction, the next chapter will examine the purposes and functions related to the zoning policies from reviewing the previous related studies.   The chapter will also give a brief overview to the green belt policy in the existing legal system.   Then, for the two following chapters, the methodologies used by previous scholars in interpreting development control data will be investigated first.   The chosen methodology (i.e. probit modeling) and the data used will also be shown.   Then, the five established hypotheses will be tested and the results will be interpreted and analyzed.   The last chapter will conclude the findings and significance of this study.   Limitations of the study and areas for further research will also be discussed.

CHAPTER II
LITERATURE REVIEW

This study evaluates the current s12a rezoning application system and measure it separateness with the s16 planning application system. In order to have a well-knowledge foundation for the investigation, literature concerning the natures and purposes of the zoning policies, especially the certainty and flexibility provided by the zoning systems will be firstly reviewed, followed by the examination of the green belt policy in Hong Kong.

Zoning Theorem

Zoning is a key instrument of planning regulation (Lai 1994b, 77) for both pre and post planning stages. During the plan drafting stage, zoning is a "prescriptive" means (Faludi 1987, 197) by which the town planner reserves adequate land in suitable locations for future development (Lai 1994b) and implements the comprehensive or master plan under the "planning theory of zoning" (Faludi 1987, 197). While at the plan

implementing stage, zoning acts as a kind of "development control", which

is a government process (Lai 1994b) for regulating the future uses of land

by specifying what should happen in the plans.

As according to Lai (1994b), zoning is intended to achieve the

followings:

- to promote socially desirable, economically efficient and

  environmentally responsible development which avoids

  harmful externality effects and promote positives ones

- to separate incompatible uses, which generate negative

  externalities which harm each other

- to integrate compatible uses, which generate positive

  externalities so that they are mutually beneficial

- to integrate public goods like roads and open space in suitable

  locations

In order to satisfy the aim of creating a better and desirable living environment, Lai (1994b) believed that zoning must be carefully planned and organized in light of the principals of:

- to separate incompatible production of consumption activities via exclusive use zoning with or without buffer areas

- to integrate compatible production and consumption activities via mixed use zoning

- to stipulate positive and restrict negative external effects via development control measures such as planning conditions, environmental performance standard

Two paradigms of Zoning

The rationale of zoning system is to arrange various zones in spatial terms on a zoning plan rationally and specify what can and cannot be developed on them. Although it aims at promoting a better physical environment for the general public, at the same time, it also represents

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certain government delineation and/ or restrictions of private rights over land within certain spatial confine. (Lai 1994b)

For this reason, there is always controversy over the positive or negative nature of zoning. Among all, it can be grouped under two paradigms — the Pigovian and Coasian zoning.

For the Pigovian Paradigm, which is first published in the book "The Economics of Welfare" by Professor Arthur C. Pigou in 1920, zoning and planning is always justify as an effective tool to regulate market failure, namely "externalities", "social cost" and "public goods", under the theses of welfare economics. They perceive a positive role for government or state regulation of the land market as it can boost the positive externalities and minimize the social cost of the community as a whole.

On the other hand, the challenger came into view forty years later by the paper "The Problem of Social Cost" by Ronald Coase in 1960. The Coase Theorem, invented by George Stigler and recognized by Coase

himself, declared that

> *"If property right is clearly delineated and if all costs of transactions are zero, then resource use will be the same regardless of who owns the property rights."*
>
> *Stigler (1966, 113; 1987, 120)*

The theory emphasizes that market can always internalize externalities itself by trading and contract within the related parties, whereupon, zoning is undesirable, unnecessary and useless in improving efficiency of land resources allocation.

Undeniably, the government intervention always implies the incursion of additional transaction costs for policy formulation, implementation and treatment. However, an absolute free market which vacuumed all government interventions also does not mean a perfect solution all the time.

As expound by Coase in the paper of "The Nature of Firm" (1937), the market also incurs some other types of transaction cost such as the contract formulation cost and the target searching cost.   Two decades later, in the sequel, "The Federal Communications Commission" (1959), he further clarified that free market solution is not always the best way to deal with the land-use allocation.

> *"...if many people are harmed and there are several sources of pollution, it is more difficult to reach a satisfactory solution through the market... As a practical matter, the market may become too costly to operate.   In these circumstances, it may be preferable to impose special regulations.   Thus, the problem of smoke pollution may be dealt with by regulations...which confine manufacturing establishments to certain districts by zoning."*
>
> *Coase (1959, 29)*

Accordingly, some neoclassical economics studies tried to insinuate that Pigovian zoning and Coasian zoning can be integrated by showing that they are mutually consistent in two distinct levels and

co-operate with each other to enhance land value.

It is suggested that the government formulated environmental policies under the Pigovian Paradigm should be used in the large, while the small numbers case should be let by the voluntary solution under the market forces as proclaimed by the Coasian Paradigm. (Lai 1994b)

In other words, according to the Coasian approach, when enormous transaction costs are associated with the operation of a free market, it is always prefer to have some regulations to promote trade, even it is less efficient than the market. (Lai 1994a) That means, the role of government is just like a facilitator to regulate the market activities so to establish and create a healthy environment for the market to operate smoothly and efficiently.

By such definition, the government, which attenuates the rights, also acts as the political protector of the property rights of its subjects and to delineate certain rights over land so to speed the way for market

activities. (Lai 1994b, 89) In the presence of transaction cost, clear delineation of rights over land is the prerequisite of the operation of the market; while zoning, as a forward planning or development control, is an essential element of the theory of the state as a polity with boundaries. (Lai 1994b) Therefore, zoning helps to delineate the boundary of land, that is, to define the right to exclude others in the use of land and avoid uncertainties in order to support the usage of the private property right of land.

In short, some may conclude that zoning, which attenuates the uses of private lands, is an institution of exclusive property rights as it indicates an "incomplete assignment of property rights". (Fischel 1978) By the coalition of the visible hand (the government action) and invisible hand (the free market), transaction cost can be minimized and Pareto efficiency can be attained.

Trade-off between Certainty and Flexibility of Zoning

"To most real estate brokers and some land economists, zoning is a means of maximizing the value of the property."

Babcock (1977, 126)

Certainty by Zoning

Zoning relates to land as property. Property in hand is surrounded by a good deal of mystique. (Faludi 1986) In order to utilize the zoning tools efficiently to facilitate the real estate market operation and promote maximum use of the valuable land, the purpose of zoning should be preventing change, so as to make real estate investment a more predictable and less risky endeavor and therefore more profitable in the long run. (Maantay 2001)

Statutory land-use plans are attempts to achieve certainty by both setting long-term planning policies at the initial stage and delineating restricted planning rights. Developers favour such regulations and restrictions as they constitute a safeguard against the unpredictable

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noxious changes of the adjacent areas which may depreciate the value of the properties.

Flexibility for zoning

In the imperfect real estate market, there will not be an definite answer for the preference of the presence and degree of zoning, which is a primary tool for the government to regulate land uses.   The only way to ascertain the solution is to conduct a cost analysis to compare market operation and an alternative institutional arrangement.   As Lai (1994b) mentioned,

> *"...whether zoning is "good" or "bad", "effective" or "ineffective" must be case specific, content specific, system specific and comparative rather than a general a priori categorical or universal question"*
>
> *Lai (1994b, 92)*

However, as Faludi (1987) pronounced, zoning regulations are "legal enactments" whose preparation and policing should not consider in individual cases. It is an observable fact that zoning policies are a general guideline for the whole field of property development. If so, it is not applicable to the optimal "case specific" solution of zoning. This will then go against the postulate of minimizing transaction costs as the general zoning principals will not always fit every individual site.

> *"The name of the zoning game…is the opportunity for change"*
>
> *Getzels and So (1988, 435)*

> *"The mark of flexible planning is to allow plans to evolve."*
>
> *Faludi (1987, 209)*

Indeed, zoning is a dynamic process. (Munneke 2005) There is always an allowance for flexibility in the ordinary urban zoning structure so to enable the change of general zoning plans to accommodate the individual cases. (Faludi 1987)

"The hallmark of zoning is the opportunity for individuals to petition for relief-to seek a change –from the general comprehensive plan"

Babcock (1979, 433)

As zoning rules are drawn generally and applied to innumerable pieces of property, there are always land parcels that are bizarre and inconsistent with the standard pattern and may not fit with the suggested land uses.

More importantly, zoning is a kind of "a proto-planning theory". (Faludi 1986, 258)   It is related to prejudge planning issues, whereas land use allocations can never be made under precise policies, given the extreme variety in the physical environment.   A gap was then opened up between the definition of the situation when the plan was produced and how that situation appears now.   This will contribute to the undervaluation of usages and misallocation of resources.   Leiden – Oxford comparison also shows that plans are not immutable while

departures are inevitable and uncertainty can never be eliminated. (Faludi

1986)

To overcome these problems, departure from the standard model of

zoning helps to avoid harsh or unreasonable deprivation of the use of

private property by permitting some flexibility. (Faludi 1986)   Otherwise,

another kind of unfairness may then be imposed upon the land owners as

they cannot maximize their gain from their own exclusive income

generating right. (Mandelker 1981)

> *"The direct means of achieving flexibility in the rigid*
> *planning system is re-zoning."*
>
> Faludi (1987, 199)

Re-zoning helps to include an element of flexibility in between by

enabling the private sector to amend the existing plans, provided that

approval by state authorities is required.   It is a kind of British-style

development control, which imposes control by a "back door basis"

(Faludi 1987, 199), thus, the authority is simultaneously keeping a strong

bargaining position.

Factually, zoning systems across the world, albeit different, always offer a provision of relaxing zoning regulations in a wholesale fashion. For instance, the American "Amendments", "Variances" and "Conditional Uses" dogma, the Australian "Consent Uses" scheme, the Dutch "Altering or Waiving Plan" regulations and the Hong Kong's S16 and S12a Applications.   These allowances offer a chance for the private sector to seek for an off-tracking uses that is tailor made for the unique characteristics of the land.

<u>A Holistic Approach to Certainty and Flexibility</u>

"re-zoning — represents a even more outspoken recognition of uncertainty."

Faludi (1987, 201)

Meanwhile, by introducing a mean to depart from the standard zoning rules, mingling the straitlaced zoning plans and malleable

re-zoning applications is simply a tension between certainty and flexibility (Sorensen 1994, 200). Hence, some may protest against rezoning as it spoils the certainty created by the rigid planning system.

"Instead of exploiting certainty, flexibility is an intelligent adaption to uncertainty."

(Faludi 1986, 255)

Faludi explained that, by accepting uncertainty and giving forethought to the matter, flexibility helps in achieving as much certainty as is possible in a world in flux. The reason is that it is impossible to fully replace the rigid standard zoning by the case-by-case assessment of each piece of land to adapt flexibility and promote efficiency by minimizing transaction costs. Hence, there should be an asymmetry between the overall zoning ordinance and individual decision. (Faludi 1986) The re-zoning system, in this case, allows a private citizen to petition for legislative change by request. (So 1979)

So as to secure flexibility as a mean to enhance certainty instead of generating uncertainty and create a situation in which market forces can operate freely within predefined limits, there must be some rules to reduce the quandary derived by re-zoning application.

To enhances certainty and flexibility concurrently, the discretion to grant or deny the private sector's proposal of change should be exercised openly, honestly, and on the basis of as through and as full a participation as possible. (So 1979) Consequently, it is suggested that zoning administration of granting or refusing zoning approvals should follow the principle of equal protection of the law, which requires comprehensiveness and uniformity of application of zoning laws. (Faludi 1986)

That means that the mark of flexible planning is to apply the *stare decisis* principle to pursue legal certainty by mean of "when deciding similar matters, to follow the previously established rules unless the case

is distinguishable because of the facts or because of the changed social,

political or economic conditions".

Moreover, due to the dynamic market change, every zoning

changes and subdivision approvals should be "consistent" with the local

general plan as they represent a change of the underlying plan. (Faludi

1986)   In other words, it is to ensure continuity when plans are evolved

and prevent the intolerable planning uncertainty bought by the re-zoning

mechanism.

Zone Separation

The prerequisite of reducing the uncertainty of the flexible re-zoning

is the consistent decision of the planning authorities on the issue of

planning application.   However, many scholars proved that the behavior

of the authorities is always haphazard.

Sorensen (1994) pointed out that zoning then merely expresses guidelines which the environmental authority gives to itself — for its own convenience so to speak — and from which it is at liberty to depart. This view is further justified by the concept of zone separation, which was first proposed by Lai and Ho (2001d). Their study identified the overlapping nature of major classes of zoning. There is high degree of overlap in column 1 and column 2 uses among various zoning classes.

In order to test the behavior of planning authorities, various zones can be grouped into distinct classes according to the nature of their particular uses. Zones can be said to be similar, mainly due to their resemble nature, such as commercial/residential (C/R) and Industrial (I) are the typical classes of zones for conducting business; on the other hand, zones are considered to be dissimilar as they are specifically for private or public uses, which are fundamentally different in nature. (Lai and Ho 2001d)

It is expected that the authorities' decision should be consistent for the approval or rejection of the S16 applications for the same uses of similar zoning classes, and vice versa. However, Lai and Ho (2001d) concluded that the label of zoning class may not always be a definite indication of its distinctiveness from another with a different or similar label. Proofing by the probit analysis in measuring the degree of separation between the two dissimilar zones, the Commercial and Residential (C/R) zones and Government, Institution and Community (GIC) zones, it is found that the the zones with different label are inseparable with respect to the common uses of school and petrol filling station.

The empirical finding implies that the discretion decisions of the TPB are not consistent at all. (Chan 2004)   Uncertainty is then brought out by the undefined approving criteria. The potential high value uses are then be ambiguous.

Study of the Planning Application in Green Belt zones

The Green Belt (GB) Zone is an important zoning class in Hong Kong. It is highly likely to be the by-product of the colonial history of Hong Kong and the response to the recommendation of the report by Abercrombie (1948). (Lai 1999) Tracing back to purposes of the UK's GB policy, they are: (1) to check urban sprawl; (2) to prevent the merging of neighboring urban areas; (3) to safeguard the countryside from urban encroachment; (4) to preserve the setting and character of historic towns; and (5) to assist in urban regeneration by focusing the redevelopment of existing urban centres. (Rydin 1993)

Coming back to the Hong Kong case, according to the clause 4(1)(g) of the TPO, the TPB is empowered to prepare town plans with specified statutory land use zones to promote conservation or protection of the environment. Hence, in the current statutory plan system, there are 5 major conservation zones dissected: (1) Country Park, (2) Coastal Protection area, (3) Sites of Special Scientific Interest, (4) Green Belt and (5) Conservation area.

As indicated by the source and general principal of the planning strategies in Hong Kong, in the Chapter 10 of the Hong Kong Planning Standards and Guidelines (HKPSG)[4], the GB Zone, as one of the conservation zones, is designated to "primarily conserve the existing natural environment amid the built-up areas/at the urban fringe, to safeguard it from encroachment by urban type development, to define the limits of urban and sub-urban development areas by natural features, to contain urban sprawl as well as to provide passive recreational outlets, with a general presumption against development."

Such a restrictive policy is so-called "green belt policy" as expressed in the explanatory statements to statutory plans. (Lai 1999) The tight land-using right is also demonstrated by the Schedule of Uses attached in the Notes of the statutory plans, which is also part of the statutory document.   It can be seen that all kinds of buildings construction are required to apply for permission before development.

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[4] Latest Edition (December 2007)

Electronic version available at "http://www.pland.gov.hk/tech_doc/hkpsg/english"

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use Barbecue Spot Country Park* Government Use (Police Reporting Centre only) Nature Reserve Nature Trail On-Farm Domestic Structure Picnic Area Public Convenience Tent Camping Ground Wild Animals Protection Area	Animal Boarding Establishment Broadcasting, Television and/or Film Studio Burial Ground Cable Car Route and Terminal Building Columbarium (within a Religious Institution or extension of existing Columbarium only) Crematorium (within a Religious Institution or extension of existing Crematorium only) Field Study/Education/Visitor Centre Firing Range Flat Golf Course Government Refuse Collection Point Government Use (not elsewhere specified) Helicopter Landing Pad Holiday Camp House (other than rebuilding of New Territories Exempted House or replacement of existing domestic building by New Territories Exempted House permitted under the covering Notes) Petrol Filling Station Place of Recreation, Sports or Culture Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Religious Institution Residential Institution Rural Committee/Village Office School Service Reservoir Social Welfare Facility Utility Installation for Private Project

Table 2- Schedule of Uses for GB area in Ting Kok OZP no. S/NE-TK/14

As illustrated by the non-statutory explanatory statement to the Draft Ting Kok Outline Zoning Plan no. S/NE-TK/14, which is the area received most of the s12 applications, the policy considerations for decision planning and rezoning approval of such uses are vividly illustrated:

> *"The planning intention of this zone is to primarily for defining the limits of urban and sub-urban development by natural features such as foothills, lower hill slopes, spurs, isolated knolls, woodland and vegetated land and to contain urban sprawl as well as to provide passive recreational outlet. There is a <u>general presumption against development</u> within this zone. Nevertheless, <u>limited developments</u> may be permitted if they are justified on <u>strong planning grounds</u>. Developments requiring planning permission from the Board will be assessed on their individual merits taking into account the relevant Town Planning Board Guidelines."*
>
> *Draft Ting Kok OZP no. S/NE-TK/14*

As implied by the planning intention, it is expected that development should avoid declared potential area for conservation uses. In order to restrict the urban encroachment to the conservation areas, the principle of "general presumption against development" is achieved by strict development controls, which only permits very few uses other than those that are necessary to manage the resource, and the permitted development is subject to the scrutiny of the TPB, based on the principles of "limited developments" and "strong planning ground".

However, as there is no reference to what (a)"limited developments" nor, (b)"strong planning ground" referred to, Lai (1999), Lai and Fong (2000) and Lai and Ho (2001c) attempted to derive their behind meanings by the probit analysis of the previous s16 applications.

(a) Limited Developments

Lai and Ho (2001a) and Ip (2005) measured the "limited developments" in terms of size of development or impact, which can be quantified by the applied uses, location and floor space of the proposed

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development as they will directly affect the size of impact to the existing

natural environment.

For the dimension of proposed usage, by the probit analysis of the

"small house policy", it found that the New Territories exempted house"

(or so-call "small house"), which is only provide for the "indigenous

villagers", is associated with a greater likelihood of being approved by the

TPB than the ordinary residential development in GB zones. (Lai 1999)

For this, Lai (1999) concluded that the government has made a big

concession in the "green belt policy" in favor of the continuation of the

"small house policy", in which the small houses are not excessive in scale,

height and environmental impact and compatible with the rule of "limited

development" in the GB zones.

Apart from those, location is also a material concern for the TPB in

approving planning applications. As tested by Ip (2005), planning

applications made in more urbanized areas were easier to get approvals

than those made in the less urbanized Rural Areas for planning application

in GB zone as development in the zones located near or in the urbanized

districts should exert less significant impact on the natural environment

than in rural zones.

However, another substantial indicator of the scale of development,

the proposed Gross Floor Area (GFA) of the planning applications, was

shown to be negative but did not significantly affect the chance of getting

planning approval in the study of Lai and Ho 2001a.   Apparently, the

"limited development" policy is in ambiguous.

(b) <u>Strong Planning Ground</u>

As state in the HKPSG, a proposal to amend the conservation zones

or to replace such areas with a different use, which imply permission to

essential development without subjecting to TPB's approval, may only be

considered in exceptional circumstances.   In these circumstances, it must

be clearly shown that alternative development sites have been considered

but have had to be rejected for sound reasons, such as critical timing, prohibitive cost or technical limitations.

However, such a general guideline is not concrete enough to provide information on the criteria of development applications to obtain TPB's approval. As there is no written statement providing information on the favorable conditions for the s16 applications, the reason for rejection may drop a hint to the statement of "strong planning grounds" that the proposed development is required to justify.

Rank	Type of reason	Proportion (%)
1.	Against "planning intention"	71.66
2.	Approval would set bad precedent	52.55
3.	Traffic problems	40.76
4.	Incompatible with adjoining uses	31.21
5.	Drainage and sewage problems	28.03

Source: Lai & Fong (2000)

Table 3 - Top five reasons used by the TPB for rejecting development applications in GB zones by proportion

The aggregate studies above shows the common grounds for rejecting planning applications for houses in GB zones. The grounds implied that the proposals with sufficient provision of positive benefits or absence of harm to the community may warrant a higher chance to be approved by the TPB.

CHAPTER III

HYPOTHESES AND METHODOLOGY

In this chapter, the five hypotheses for testing the consistency between the two types of development applications will be introduced and justified. Subsequently, there will be a comprehensive review of various kinds of data and statistical models. The suitable one will be selected for testing the hypotheses.

HYPOTHESES

With the availability of planning application statistics collected from the Planning Department, it is possible to evaluate development controls empirically in Hong Kong. (Lai and Fong 2000) In order to test the consistency and integrity of the Board in making decision on approval the planning applications under s12a and s16 of TPO in the GB Zones, the following refutable hypotheses has been formulated and are going to tested by the previous development applications:

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Hypothesis I : All development applications made under s12a
and s16 of TPO in sub-urban and rural areas in
GB Zones are associated with lesser chance of
being approved than those in old urban regions.

Hypothesis II : Both planning permission and rezoning
approval decisions in respect of all uses in GB
Zones show bias on the larger development.

Hypothesis III : The probability of obtaining planning
permission and rezoning approval for the
development of VTH in the GB Zones would be
greater than applying for ordinary residential
development.

Hypothesis IV : Applying for public uses which are provided for
promoting general public benefit are always

associated with a greater chance of getting

approval, regardless the proposal is submitted

under s12a or s16 of TPO.

Hypothesis V   :   Applying for unproductive private uses is

related to a lower chance of getting planning

permission as well as rezoning approval.

Interpretation of the Hypotheses

Altogether five hypotheses are going to be tested for the decisional

behavior of the TPB in term of the location, size and uses of the submitted

planning and rezoning applications.

Hypothesis I reveals whether there are any preferences in granting

planning permissions or rezoning approval towards a particular region in

the GB Zones. It is assumed that the preference of the regions is

determined by its degree of urbanization. As found by Ip (2005), in

chorus with the "green belt policy" of the TPB to have a "presumption against development" and "limited development" within the GB areas, proposed changing in uses of land in the more urbanized areas are appeared to stand a higher chance to approved than the less urbanized and rural areas.

The hypothesis testing tries to restate the TPB prejudiced against the application in the sub-urban and rural areas. Hence, planning applications in NT are supposed to be less likely to be approved than the other applications in the Hong Kong Island and Kowloon, which are the well developed old urban areas.

On top of that, parallel between s12a and s16 applications, the notch of urbanization should also yield similar impacts on rezoning requests. Hence, if the Hypothesis I is not yet refuted, it can extrapolate that the decisions of the TPB on s12a applications are go in line with the general principle of the existing zoning and the decisions of s16 one.

On the other hand, if the hypothesis is refuted, it implies that there are no austere restrictions on rural and less developed regions. The change of land use zonings in rural areas will impose more severe and significant damage on the natural environment which is not yet developed and contaminated. Hence, the lack of stricter regulations in the sub-urban and rural areas implies the violation of the "presumption against development".

Beyond that, it further implied that the TPB's decisions on s12a and s16 applications are mutually contradictory. The inconsistent decisions of TPB will further increase the uncertainty within the town planning mechanism and make it less attractive to the private land market.

Secondly, Hypothesis II evaluates the relevance of scale and size of the proposed development posed on the decision of the TPB in the two types of development applications.

Logically, the TPB is expected to have an inherent bias towards larger scale of development as they will create greater disruption to the conservation areas.

The tests also have a further implication on the rent-seeking argument by various scholars and researchers. (Chau and Lai 2004; Chau, Lai, and Hammer 1996; Lai and Ho 2001a, 2001c, 2001d, 2003) It is believed that the bigger the development size, the more capital is required. The logic is that only the larger developers, who are more resourceful in lobbying the TPB, are capable to make such a huge investment. Hence, if their proposals are more likely to be accepted by the TPB, it insinuates the presence of the rent seeking activities.

Otherwise, if the hypotheses are not yet refuted, large scale developments applications are corroborated to obtain planning or rezoning approval with difficulty. Also, the rent-seeking behavior in the decision making process of the TPB exists. The decision of the TPB is not independent at all as it is affected by some external factors.

In addition, the hypothesis tests if the decisions on s12a applications share the same view with the s16 applications.   Therefore, if Hypothesis II is not refuted, it recognized the approval consideration of rezoning applications is harmonized with the s16 applications.   There is a distinct pattern of success rate across the proposals with assorted size.

However, if the hypothesis is refuted, it will show that the two types of planning requests result in different outcomes and will demonstrate inconsistent behavior on the part of TPB when considering s12 and s16 applications.

Lastly, for the land uses factor, various proposed uses will be evaluated by the remaining hypotheses -- the Hypothesis III to V. As some particular uses are demonstrated to link with a higher chance of getting approval and some with lower chance in s16 application, the hypotheses are to test whether or not the s12 applications yield the same.

Hypotheses III is to test which type of residential development is regarded as more favorable to the TPB. Previous researches by Lai and Ho (2001d) and Ip (2005) have already revealed the preference of TPB in VTH along the GB areas. The VTH developments are exempted from the general principal of limiting development. Therefore, using the ordinary residential development (RES) as a comparison representing a larger scale of residential development and inflicting more severe damage to the surrounding environment, Hypothesis III seeks to test whether the well beaten track of preferring to VTH in planning applications is still valid nearly a decade after that study.

Using the same rationale for planning applications, it is hypothesized that the chance of getting an approval in rezoning the GB areas to the Village Type Development (VTD) zones is also higher as VTD zone is the only zone that development of VTH is always permit and in which other building development are subjected to permit or prohibited.

If Hypothesis III is refuted, it implies that the TPB has had a change in its altitude towards the VTH development. This further demonstrates that the decisions and administration of the TPB are full of paradoxes and that contradictory judgments are also made.

Apart from the residential uses, two hypotheses, Hypothesis IV and V, pertain to the test of the uses with highest and lowest approval rate respectively.

Hypothesis V tests the uses which are most likely to be approved by the TPB. As the axiom of town planning is to promote general welfare and to improve the living and working standard of the general public, the proposed uses that can offer additional public interest and enhance the social gain, such as the GIC uses, Public Utility Installation (PUI) uses, Road and Open Space (OS), are linked with a higher rate of approval as they are provided with a "strong planning ground".

If the hypothesis is not yet refuted, that shows that the TPB have an

implied ranking for the uses of the GB areas and the one with higher preference will be more likely to succeed. Also, it is believed that the uses which can provide more public benefits are more likely to be preferred by TPB.

On the other hand, Hypothesis IV seeks to prove whether the applied use of OST poses a significant restraint on getting the grant of the planning and rezoning approval. As the OST uses, which are not productive, always involve a massive deforestation without any remedial action to provide greening and open space for public uses, it will also ruin the local ecosystem and destroy the habitat of the wildlife. Hence, it is expected that the applied OST uses will be associated with a low probability of getting changing use approval, regardless of the types of applications.

If the Hypothesis V is not yet refuted, unlike Hypothesis IV, it means the "less likely to be approved" uses are deemed to be failed according to the "preference ranking" by the TPB as confirmed by the Hypothesis IV.

Same with previous, if either Hypothesis IV and V are refuted, the decisions upon the two types of development applications by the TPB are not coherent and the decisive criteria of getting planning or rezoning approval are ambiguous. There are no ways for the general public to figure out the development potential of their land, in which the uncertainty indirectly attenuating the private property right of the land leaseholders.

METHODOLOGY

In the following, the nature of planning application data will be introduced first.   Then, two methodologies of analyzing planning data, the aggregate analysis and non-aggregate analysis will be briefly illustrated and their strengths as well as weaknesses will be discussed.   Finally, the model for the analysis of the dissertation would be chosen and reasons will be given.

Planning Data Analysis

Development control, economically, is a means of non-price allocation of development and redevelopment rights. (Lai and Ho 2002b, 147)   Data related to the development control process represent one of the best potential sources for analyzing the way in which the built environment has evolved. (Gilg and Kelly 1996)

One major use for development control data is to evaluate the extent to which policies in plans have been implemented or adhered to. (McNamara and Healey 1984) It is also widely used by the researchers and practitioners to assess trends in demand for development, and the impact of the planning system upon this. (Sellgren 1990)

Despite its usefulness, the data are always criticized by its nature of inherent flaws and the difficulty of analyzing it in any other than a simplistic and mechanistic manner. To overcome the difficulties, Glig and Kelly (1996) suggest four ways of using the development control decision data:

I.   By simple statistical and cartographical analysis;

II.   By logical positivism analysis;

III. By power struggle or political economy analysis;

IV. By Post-modernism analysis.

The first two methods, they are largely similar as both of them usually employed the "aggregate data" to provide a straightforward analysis to the real world-situation while the second one is a more sophisticated method to conduct studies on the basis of viewing the decision-making process as a technical exercise.

While the third approach is to use case studies informed by structuralist Marxist perspectives. The last analysis is always applied to examine the process as a random but related sequence of event, which regards planning process as a random but related sequence of events.

<u>The Use of Aggregate Data</u>

For the aggregate planning statistic, it refers to the generalization of information about the data of individual planning application cases. (Lai and Ho 2002b) It usually describes the flows of applications through planning authorities, enumerates the total numbers received, calculates the mean decision times for each category, derive the average success and fail rate of planning applications and appeals, examines the types of

development most likely to be refused and analyzes the implementation of

specific planning policies, such as the   studies in the Areas of Outstanding

Natural Beauty (A.O.N.B.) done by Blacksell and Gilg (1977) and

Anderson et al. (1981)

All these statistics and analyzes involving the measurement of totals

and averages are aggregates, as they represent generalized information

calculated from information of individual development control

applications and decisions about them for specific areas over given periods

of time. (Lai and Ho 2002b)

The aggregate analysis is prevalent in the subject of planning

research. It is widely used by planners, scholars and students to explain

the actual practice and decision of the planning authority and generalize

some trend for the developers for applying planning permission.

Larkham (1990a), Sellgren (1990) and Gilg and Kelly (1996) did identify

the continuing popularity of aggregate data is ascribed to the ease and

speed up access to data.   With the preoccupation with the "hard facts" of

development control decision-making, there is a tendency for easy availability of data to shape the subject and techniques of research. (Larkham 1990a, 2)

Moreover, the aggregate planning data are notably useful in deriving the average success rates of development applications, which is an essential element in measuring the development pressure, which show the difference between supply of demand in building development. (Larkham 1990b)

Even so, as pointed out by many researchers, including McNamara and Healey (1984), Larkham (1990a, b), Preece (1990) and Sellgren (1990), there are several methodological limitations for models that rely on aggregate development control statistics. (Lai and Ho 2002a)

The most serious problem is the ambiguous definitions and measurements of planning variables. (Lai and Ho 2002a) As the planning system is, to a large extent, discretionary, and planning decisions

may not always be related to state policies, (Larkham 1990a) it is so called "black box treatment" of the planning permission mechanism. (Lai and Ho 2002a)

Another key problem of using aggregate data is the loss of essential information about individual planning permission statistics, notably as development sizes and specific planning conditions. (Lai and Ho 2002a) Larkham (1990a, 3) described the development control data as "Cinderella" due to the lack of resources which are perceived to be of little significance. Lai and Ho (2002b) also addressed the problem of aggregate studies as most of them are sampling rather than a comprehensive one. The problem can be solved by a decent choice of suitable sampling criteria. However, such a choice is often hard to make.

Selectivity of related materials for the research or studies is always problematic as the planning data are end-statements of a complex process of negotiation, differing in type, duration and complexity in the case of each application. (Larkham 1990a) The wrong choice of the sampling

data may perceive to be of little significance of the outcome.

Last but not least, the obstacles of identification of the appropriate weighting factors also pose a pitfall for aggregate analysis. (Lai and Ho 2002b) Average measures do not imply equal comparison as planning applications are determined "on their own merits". This implied that every case is unique and ought to be evaluated as such. (Larkham 1990b, 152; Sellgren 1990, 176) In order to make comparisons between different cases possible, some form of weighting to standardize data must draw from different sampling units in order to transform the set of applications to make them homogenous and keep variables to be sampled consistently and coded in some way for further analysis. (Sellgren 1990)

In fact, previous studies have already addressed on this problem. Some scholars, including Brotherto (1982) and Anderson et al. (1981), tried to use some parameters for weighting and standardizing the variables of population density and site areas respectively. However, standardizing, on the other hand, simply mean disaggregating the data. (Sellgren 1990)

The Use of Disaggregate Data

To overcome these limitations of the aggregate methods, Lai and Ho (2002b) proposed to make use of the probit model (i.e. using disaggregate data) to better evaluate the raw planning data. By this model, it is to form a comprehensive collection and quantitative analysis of statistics of individual planning applications rather than a sampling one.

K.G. Willis is the pioneer of this approach. His work is the first published planning analysis using disaggregated development control data of individual development applications. He made use of a logit function with a discrete choice model to predict the outcomes *of* the underlying decision process without claiming to emulate the sequence and manner in which information is processed by the decision-maker. (Willis 1995)

In Hong Kong, Tang and Tang (1999) was the first one to made use of discrete choice model planning area. They applied the logistic function in the model to evaluate the effectiveness of land use planning incentive for private redevelopment in the "two-tier plot ratio" system so to test the

correlation between site area and the chance of planning approval.

Despite the superiority of the disaggregate data model over the aggregate one, there are not so many researchers who have employed disaggregated data in the area of planning control. (Ngai 2002)

The reasons are that of the high cost incurred in the process of data collection, especially in collecting the relevant planning application statistics. (Lai and Ho 2002a)   By the continuing advancement in information technology and the popular adoption of open government, the costs in gathering information today are much lower. (Lai and Ho 2002b) These further facilitate the use of non-aggregation approach to generate a more accurate and reliable planning studies.

Nevertheless, the advocate of non-aggregate data studies, Sellgren (1990) and Lai and Ho (2002a), still justified the applicability of aggregation method in the scope of planning research.   The aggregate analysis is valuable, to the extent that, to generate some initial findings for

taking further steps to evaluate rigorously the data by non-aggregate means.

In other words, aggregate data is used to identify general picture and show a brief trend (Sellgren 1990, 24) and the disaggregated data will take the next step to have an "in-depth" explanation of the tested variables.

Model Specification

<u>Study of Qualitative Model</u>

Regression analysis, which is multivariate nature, has widely been used in the scope of social sciences. However, when the dependent variable is a qualitative measure rather than a continuous, interval measure, regression may lead to serious errors in inference and seriously misestimate the magnitude of the effects of independent variables. (Aldrich and Nelson 1984) Hence, to test the qualitative choices and dichotomous decisions of the individual in which the endogenous random

variables take only discrete value, qualitative response models, which are also known as quantal, categorical or discrete models, will be more suitable and preferred. (Amemiya 1981)

Also, many aspects of decisions made in the planning process involved exactly the choice between two discrete alternatives, either approval or rejection.　Thus, binary models have an important role to play in testing these planning decisions as individual observations instead of aggregating them. (Lai and Ho 2002b)

As the purpose of the dissertation is to proof whether the decision of the TPB in approving s12a application is in unison with the decision hold on s16 application, the probability of being approved in s12a and s16 applications and the specific factors which determine the likelihood of a planning application being approved by the planning authority will be tested.　It further justified the use of binary or probability model to test the hypotheses.

There are three common forms of probability function used to draw conclusions about the likelihood of potential events and the underlying mechanics of complex systems. They are the linear probability model and non-linear probability model, in which include logit model and probit model. They are used wherever the dependent variable is a probability whose value is restricted to from 0 to 1.

Linear Probability Model

In a regression model, dependent variables are assumed to be continuous while no restrictions are placed on the values that the independent variables take on. (Aldrich and Nelson 1984)

$$Y_i = \beta_1 + \beta_2 X_{i2} + \beta_3 X_{i3} + u_i$$

Thus, by summation notation to generalize the regression function, the above function will be transformed as

$$Y_i = \sum \beta_k X_{ik} + u_i$$

For the linear probability model, which is also known as binary regression model, the function is just interpreting the regression equation as a probability. The only difference is the value of the dependent variables will be restricted to 0 or 1. (Aldrich and Nelson 1984)

$$E\left(Y_i \middle| X_{i1,} \cdots X_{ik}\right) = \sum \beta_k X_{ik}$$

A drawback of this model is that only the dependent variables are restricted to the binary value while the right hand side of the function left unconstrained. Thus, unless restrictions are placed on β, the estimated coefficients can imply probabilities outside the unit interval (0 or 1) and marginal effects at low and high parts of the distribution may then be unrealistic. However, even using the least squares (LS) method or weighted least squares (WLS) method to yield consistent and unbiased estimates of β, the inherent weakness of the model still cannot be eliminated. (Amemiya 1981) Moreover, in most cases, it is unrealistic to

assume the independent variables are in linear form, that is, to be continuous. (Aldrich and Nelson 1984)   For that reason, other non-linear probability models are suggested.

Non Linear Probability Model

Nelson and Aldrich (1985) develop the logit and probit analyzing dependent variables which are not continuous. (Aldrich and Nelson 1984) The logit model and probit model are non-linear models for estimation with binary dependent variables.

It was noted that both probit and logit estimations yield asymptotically unbiased and efficient estimates which are asymptotically distributed as normal variates. (Aldrich and Nelson 1984)

The two models are applicable to evaluate the town planning application system and examine the likelihood of a planning application being approved as all applications are assumed to be independent with each other and considered at the individual merit.

Probit Model

The idea of probit was published in 1934 by Chester Ittner Bliss (1899-1979) on how to treat biological data such as the percentage of a pest killed by a pesticide. (Bliss 1934)

The probit model is capable of dealing with dichotomous dependent variables, which cannot be handled by methods like linear multiple regression.   It is frequently used to analyze non-aggregate statistics. (Lai and Ho 2002b)

The probit function is to depict a normal curve, or technically, the cumulative normal distribution function (CDF). (Aldrich and Nelson 1984) It is a quantile function associated with the standard normal distribution. Hence, the probit function is in fact a cumulative distribution function, which is denoted as follows:

$$P(Y_i = 1|X) = \emptyset(\sum \beta_k X_{ik)} = \int_{-\infty}^{\Sigma \beta_k X_{ik}} \frac{\exp\left(-\frac{u^2}{2}\right)}{\sqrt{2\pi}du}$$

Probit model, which yields the empirical estimates of individual explanatory variables, allows for the prediction of whether a planning application for a particular use will be more likely to be approved by the TPB. (Lai and Ho 2002a)

Logit Model

The Logit and Probit models are more or less the same.   The logit function, or logistic function, was invented in the 19th century for the description of the growth of populations and the course of autocatalytic chemical reactions, or chain reactions.(Cramer 2003)

A sigmoid curve can be traced by the following logit function:

$$\log \left[\frac{P_i}{(1 - P_i)}\right] = \sum \beta_k X_{ik} \equiv Z_i$$

In order to take the expression of P_i, antilogarithms and algebraic manipulation will be used. The notation of "*exp (·)*" means e^5 raised to the power of whatever is inside the parentheses. So,

$$P(Y_i = 1|X) = \frac{\exp(Z_i)}{1 + \exp(Z_i)}$$

The logit function is continuous and take on any value from 0 to 1 by increasing monotonically with Z_i, in which Z_i ranges from $-\infty$ to $+\infty$. That means, unlike the linear specification, it satisfies the 0-1 constraints on P_i without constraining the dependent variable, Z_i ($\sum \beta_k X_{ik}$)..

Despite the similarity between the Logit and Probit models, the extreme values of *Xi* in Logit model is less preferred, and hence, only probit model will be used in this Paper.

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[5] The mathematical constant "*e* " is the base of the natural logarithm

Maximum Likelihood Estimation

The probit and logit parameters are typically estimated by method of Maximum Likelihood Estimation (MLE), which is different from the Least Squares Estimation (LSE) as used in the ordinary regression models.

Although both MLE and LSE have similar properties of unbiasedness, efficiency and normality, they are not perfectly the same. The differences are that MLE using on the probit and logit models is no linear and asymptotic. (Aldrich and Nelson 1984)

In MLE, it proceed to find β so as to maximize

(i) the probit likelihood;

$$L(Y|X, \beta) = \prod_{i-1}^{N} \left[\left(\emptyset \left(\sum \beta_k X_{ik} \right) \right]^{Y_i} \left[1 - \emptyset \left(\sum \beta_k X_{ik} \right) \right]^{1-Y_i}$$

or

(ii) the logit likelihood;

$$L(Y|X, \beta) = \prod_{i-1}^{N} \left[\frac{\exp\left(\sum \beta_k X_{ik}\right)}{1 + \exp\left(\sum \beta_k X_{ik}\right)} \right]^{Y_i} \left[\frac{1}{1 + \exp\left(\sum \beta_k X_{ik}\right)} \right]^{1-Y_i}$$

A minor drawback to MLE is caused by the likelihood equations for probit and logit are nonlinear in the parameters to be estimated. (Aldrich and Nelson 1984) Since the dependent variables are never directly observed, its scale cannot be determined. (Aldrich and Nelson 1984) Hence, it is impossible to obtain the algebraic solutions of β by MLE as it is only used to find out the set of values of β that can maximize the probability (likelihood) of a particular observation.

To overcome such flaw, approximations by standard iterative algorithms should be used. (Aldrich and Nelson 1984) The iteration method, starting with an initial value, attempts to improve on this guess by adding a vector of adjustments, and ends until there is convergence. (Long 1997) These algorithms are readily available and use of them makes the

extra computational effort transparent to the user by different computer

program such as EView, SAS and SPSS.

Data Specification

Records of all amendment of plan and rezoning applications from

the period January 1998 to March 2009 in GB zones are extracted from the

database of the Planning Department electronically from the internet[6], and

manually from the Planning Enquiry Counter.   Therefore, there are

altogether 95 sets of s12a applications in the latest 12 years would be

employed in this research paper.

Although the general information of the applications, including the

address of the proposal, related statutory plan, existing and proposed

zoning, final meeting date and the decisions by the Board, are listed in the

Internet, most of the detailed information, including the site area,

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[6] All the data are available in the Statutory Planning Portal (www.ozp.tpb.gov.hk)

application date, proposed GFA and uses, cannot be found on the site and all can only be gathered in person in the Planning Enquiry Counter of the Planning Department. Moreover, as proclaimed by the TPB, all the rezoning applications before 1 June 2005 are kept in private and not disclosed to the public, data can only be obtained through special requested to the Board by letter.

While for the planning application data, the data from January 1998 up to May 2008 are collected by the undergraduates and higher-degree research students of Professor Lawrence Lai. The other relevant data series till March 2009 are updated from the database of the Planning Department. After the revision and cross checking, there are altogether 1031 sets of s16 applications in the latest 12 years are available for the hypothesis testing.

All of the data will be employed at the first part of the result interpretation so to outline a general picture of the rezoning and planning requests in Hong Kong by an aggregate approach. The analysis seeks to

find out (1) the numbers of application in each (a) year and (b) region, (2) the average approval rate and (3) the most common rejected grounds in the GB zones.

For the disaggregate analysis, the data will be divided into two different pools in order to construct two models for hypotheses testing to reckon the consistency between the decision on rezoning and planning applications. They are the data sets of s12a and s16 in the GB zones in the whole Hong Kong respectively. There are altogether 95 and 1031 and sets of data in the pools individually. The data will be engaged to build up the probit model for proving the hypotheses. The testing of Hypotheses I to V will make use of the first data set of s16 applications while the testing of Hypotheses VI to X will rely on the data sets of s12 applications. In the followings, the independent and dependent variables of testing the hypotheses will be introduced.

Dependent Variables (y)

It is the final outcome of the equation and its value depends on different characteristics of that particular set of data. (Ngai 2002) In the probit analysis, the dependent variable is the probability of an application being approved. In order to simplify the model to yield the predictable implications, value of the dependent valuable will be strictly limited to either 0 or 1, with rejected case as 0 and approved as 1.

Hence, the interpretation of "y" is as follows,.

$$y^* = \sum_k \beta_k X_{lk} + u_l$$

As the value of y* ranges from $-\infty$ to $+\infty$, it is then linked to the observed binary variable y (the outcome) by the following equation to

$$y = \begin{cases} 1 & \text{if } y^* > 0 \\ 0 & \text{if } y^* \leq 0 \end{cases}$$

Independent Variables (x)

In the study, 4 types of independent variables (x), namely location,

size, use and time factors, will be included to test the impact on the

dependent variables (y).

Location Dummy (NT)

As to test on how the degree of urbanization affect the decision of

the TPB in rezoning approval, five broad regions are defined

geographically: Hong Kong Island (HK), Kowloon (KLN), and New

Territories (NT), which could be further subdivided into urban New Towns,

Rural Areas and Outlying Islands (OI).

HK and KLN regions are always classified as the old urban area due

to their long development history since the beginning of the colonial period

in 1840s while the urban new towns, introduces in the 1970s, are regarded

as the newly emerged urban area or sub-urban area.   The remaining parts

of the NT are defined as rural areas where most of the space are covered by greening.   The outlying islands are undefined as each of the islands got their own particular special features and develop separately from the general growth of the whole territory.

So, dummy variables based on the geographically are set.   If the application site is located in the New Territories, they are defined as sub-urban or rural areas.   The variable of NT will be 1.   If otherwise, the site situated at either HK or KLN, which are defined as old urban areas, will be indicated as 0.   As it is difficult to define the characteristic of the sites in the Outlying Island, with a small number of cases applied in it, the Outlying Island cases will be eliminated for the study.

NT   =   1   If the site under application was

located in NT

0   If otherwise

Size Variables

Following most of the previous empirical analysis of various zones of s16 applications (Lai and H0 2001a, b, c, d; 2002a, c; Chau and Lai 2004) , measurement of GFA is preferred to site area (SA) to represent the size of the proposal as it is a more fitting mean to signify the scale and accommodation value of the final development. (Lai and Ho 2001b)

However, as studied by Lai and Ho (2001a), the impact of proposed GFA, though negative, is insignificant in affecting the approval rate s16 applications in GB zones.   Followed to the past analysis, GFA will also be test to see the TPB's decisions will be affect by the size of GFA.

Moreover, if the proposed GFA is not concluded as a decisive criterion for the TPB's decisions, the SA may then be a matter for the TPB to ponder.

While the GFA is the proxy for the degree and density of the development, the SA will be another indicator to provide clues of the size

and extent of the development. Thus, the larger the proposed SA, the bigger size of site clearing and deforestation is implied to take place in the GB areas. This justified SA may also be influential to the decision of the TPB in the GB areas.

In the study, all the GFA and SA will be adjusted to measure in square meters in order to give a consonant computation.

For the data sets missing out from the information about GFA, GFA will be data will be assumed to be the same as SA if the proposed for planar development such as the uses of open storages, containers, warehouses, car parks and pond fillings. Otherwise, for perpendicular development, the data with missing GFA information will be ignored in the analysis

Use Dummy

Due to the fundamental differences between the two application systems, it is impossible to compare the proposed uses of s12a and s16 applications directly. For s12a applications, it is applied for the change of

the zone as a whole while for the s16 applications, it is seeking for the

approval of a specific use which is expressed in the column 2 of its

belonged zone.

In order to give a comparison between the uses applied in the two

applications, an attempt is made to convert the proposed uses in s16 into

their affiliated zones.[7]   That is, it supposes that if the developers applies

for rezoning in case of a rejection of the planning application, (s)he will

request for rezoning the existing zone to another one so that his proposed

developments will fall into the column 1 uses of the respective zones and

further planning applications are no longer required.

Hence, as reference of the Schedule of Uses of the existing OZPs,

the applied uses in the s16 applications will be represented and substituted

by different zones in which they can fit in with the column 1 uses of that

zone.   In cases of the overlapped uses, such as Religious Institution, the

most relevant zones in regard of the intention of the application and the

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[7]For the list of s16 applied uses and their affiliated zones, please refer to Table 9 in Appendix.1

zone, as stated in the applying proposal and the statutory plans, will be chosen as this research paper aims to test the probability of different uses to get approval for development which is not always permitted at the existing statutory plans.

While in the optimal equation, we will only incorporated four uses dummies in order to compare the difference in probability among the similar uses and the significance of the effect of the most and least likely approved uses.

For the two similar uses, the VTH and other kinds of residential development, which are both residential uses, will be tested in order to give a comparison between them.   The VTH will be group into the VTD zone while the remaining will fall into the RES zones.   If the proposal is a request for applying VTD zones, the variable will be indicated as 1, 0 if otherwise.   If the case applied fall in the use of RES, the variable will be 1, 0 if otherwise.

On the other hand, as the GIC uses, open space and road are uses related to public interest, they expected to be more likely to be approved; while the open storage uses, which is not productive and create no interest for the general public, they are less likely to be approved.   Hence, if the case applied fall in the use of either "GIC", "OS" or "ROAD", the variable will be 1, 0 if otherwise.   If the proposal is a request for the "open storage" uses, the variable will be indicated as 1, 0 if otherwise.

$$VTD \quad = \quad 1 \qquad \text{If the applied use was village-type}$$
$$\text{development}$$
$$0 \qquad \text{If otherwise}$$

$$RES \quad = \quad 1 \qquad \text{If the applied use was ordinary}$$
$$\text{residential development}$$
$$0 \qquad \text{If otherwise}$$

$$GIC \quad = \quad 1 \qquad \text{If the applied use was government,}$$
$$\text{institution or community uses}$$
$$0 \qquad \text{If otherwise}$$

$$OS \quad = \quad 1 \qquad \text{If the applied use was open space}$$
$$0 \qquad \text{If otherwise}$$

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ROAD = 1 If the applied use was road

0 If otherwise

STO = 1 If the applied use was open storage

0 If otherwise

Time Dummy

As the section 12a is incorporated into the TPO, the rezoning applications are legislatively recognized as a statutory uses changing request, the probability of obtaining planning approval for GB zones may be different if they were decide before or after the legislation of rezoning application become effective. A time tummy variable is then set to eliminate the influence of the legislation enforcement. If the decisive meeting of the TPB is hold after the issue of the s12a application, the variable will be 1; 0 if prior to it.

TIME = 1 If the meeting date of the case was

after 10 June 2005

0 If otherwise

CHAPTER IV

EMPIRICAL RESULTS AND IMPLICATIONS

To analyze the issue in a broad perspective, aggregated data is valuable to show the recent trend. Hence, a preliminary study about the aggregate statistics on previous planning and rezoning applications in GB zones will be first conducted to give an incipient comparison between the two. This is followed by a comprehensive probit analysis to yield the more detail findings.

Preliminary Aggregated Studies (1998-2009)

A statistical and cartographical aggregates analysis will be conducted to reveal the general and regional application statistics and approval rates per annum. These totals and averages analysis represent the generalized information calculated from information of individual development control applications and decisions about them for specific areas over given periods of time. (1998-2009/03)
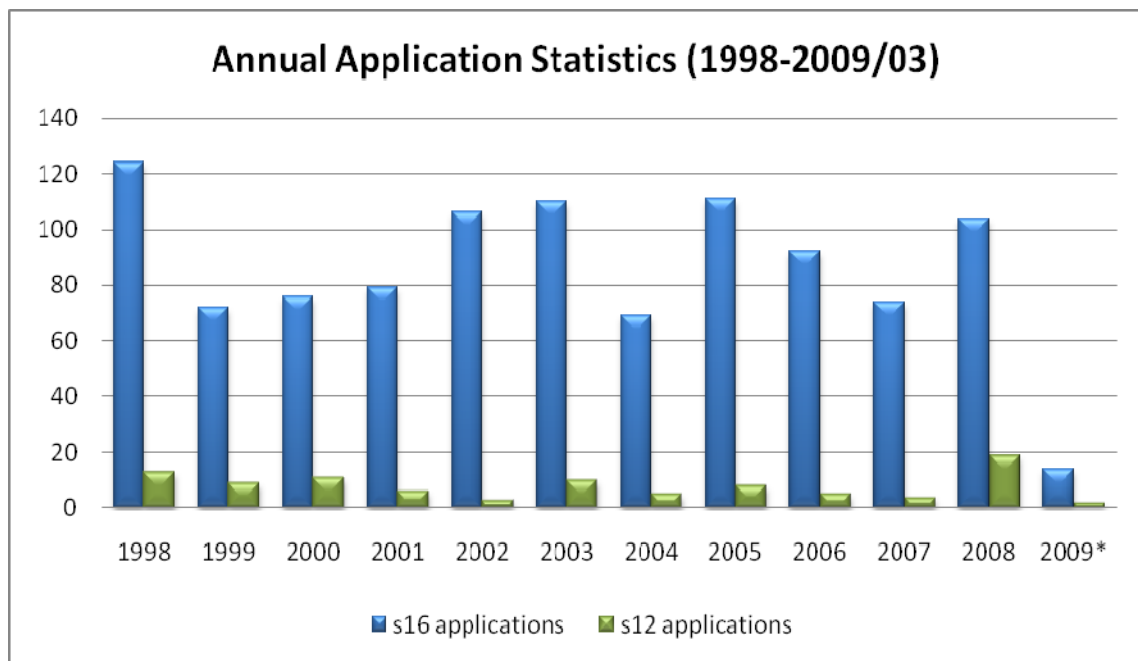
Graph 1 – <u>Annual Application Statistic in GB Zones in 1998-2009</u>[8]

Figure 1 shows the respective numbers of applications handled by the TPB each year. In the past decade, there are a cumulative application of 1031 and 94 (Yearly Average: 92 and 8) for s16 and s12a respectively.[9]

Obviously, the s16 applications are more commonly used by the developers than the s12a applications. There must be some reasons for

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[8] For the detail figures, please refer to the Table 14 and 15 in Appendix 2

[9] The average application rate is only a measurement of 11 years record between year 1998 and 2008 as there are only 2 month records for year 2009. The rate is calculated by the years over the number of total applications from 1998-2008.

the applicants preferring the s16 applications to the s12a one.   It may be

due to the difference in the complexity of the application procedures,

duration of the application time and ease of getting application approval.

However, as provided by section 12a and 16 of TPO, the procedures

and processing time for both planning and rezoning applications are more

or less the same.   Hence, barrier due to complicated application procedure

is eliminated.

The threshold for application approval may explain for the

discordant choices of the developers.   To verify this interpretation, the

reasons of rejection and the success rates[10] of the two applications are

assessed.   Results are show as follows:

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[10] The success rates of planning or rezoning applications are dividing the number of
approved applications by the total number of applications.   Only the cases granted
with approved, approved with conditions and approved with conditions at
temporary basis are considered as success application.   The partially approved
and revoked cases are disregarded.
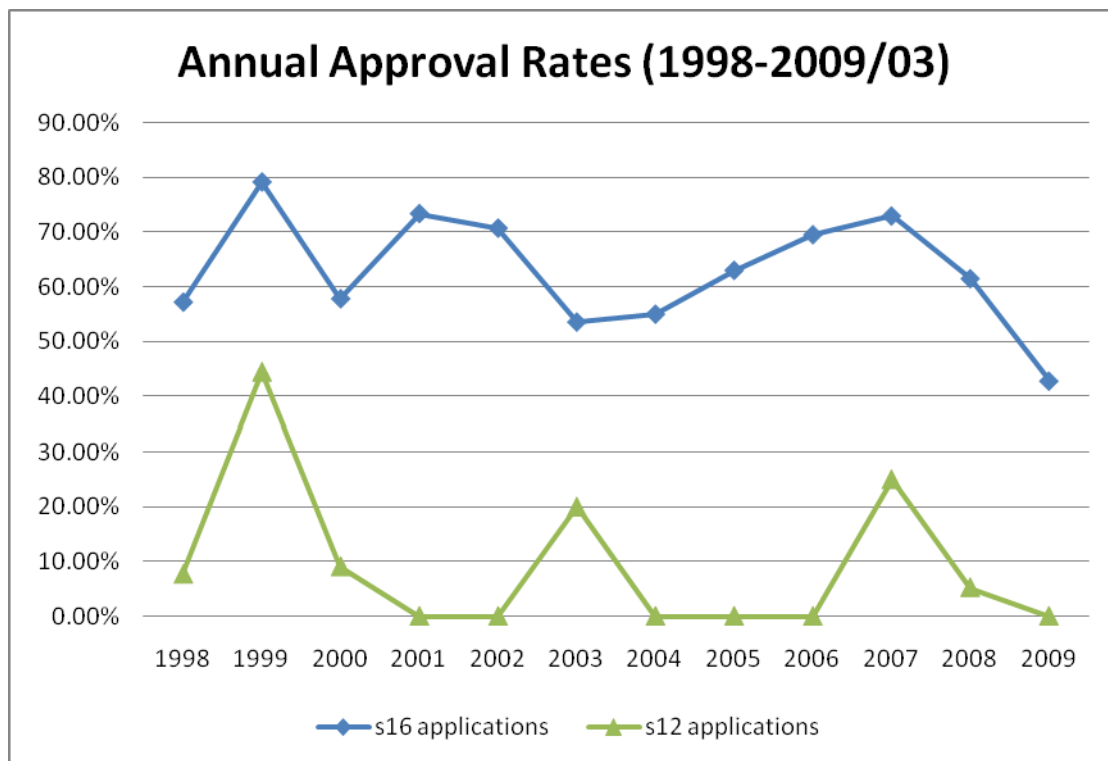
Graph 2 – <u>Annual Approval rates of s12 and s16 Applications in GB Zones in 1998-2009</u>[11]

Graph 2 displays the annual success rate of the s16 and s12a applications. Neglecting year 2009 which lacks a complete record, more than half of the planning applications were granted approval annually. In 1999, 2001, 2002 and 2007, the approval rates are even over 70% of the total application.

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[11] For the detail figures, please refer to the Table 16, 17 and 18 in Appendix 2

On the other hand, the average success rates of rezoning applications are below half. Other than 1999 which showed an abnormal high rate of approval at 44.44%, the rates are less than a quarter of the total application. Strikingly, no cases were approved in the year of 2001, 2002, 2004, 2005 and 2006. Thus, it is an observed fact that the s16 applications are more likely to be approved by the TPB than the s12a applications.

Despite the explicit fact that developers have a greater chance to be awarded a use changing approval from the planning applications, there may be some other endogenous factors affecting the approval rates of the proposal other than the types of applications.

Therefore, the next step is to examine why the TPB prefers planning permission to rezoning approval. As there are no explanations given to justify the bias towards the rezoning proposal, an endeavor is made to investigate from the rejected grounds given by the Board.

	S12a applications	S16 applications
1	Bad Precedent	No strong justification
2	Against Planning Intention	Against Planning Intention
3	No strong justification	Bad Precedent
4	Traffic and Vehicular Access Problems	Incompatible with Neighbouring Environment
5	Flooding, Drainage, Water Supply and Sewage Problem	Open Space .Landscape Problems
6	Existing Uses to be maintained or Reserved for other uses	Traffic and Vehicular Access Problems

Table 4 – <u>Ranking of the 6 major grounds for rejecting the s16 and s12a applications in GB Zones</u>

Table 1 summarized the major grounds of rejection given by the TPB. The top three declining reasons are the same between applications. They held firmly that the proposed uses on the GB Zones should adhere to existing development plans and conserving the green areas as much as possible. With this speculation, rezoning application should be less likely to obtain approval than the planning applications. This can be attributed

to urbanization of the rezoned areas without subjecting to a mandatory permit.

Rejection of s12 applications due to "Incompatible with Neighboring Environment" may give rise to s16 applications as rezoning can facilitate a more comprehensive planning for the whole area instead of a piecemeal development in a single lot.   Hence, this can meet the general planning concept of the TPB to create a harmonious building environment.

The contradicted implication derived from the rejected reasons means it is not an adequate source to tell which type of application will have a higher rejection. Attempt is made by going into the application proposals to study the reasons underlying the TPB's decision to make an accession to the use changing requests.

By Ip (2005), locational factors always play a role in influencing the TPB decisions.   Hence, the proportion of applications in different regions to the total number of applications is generalized.
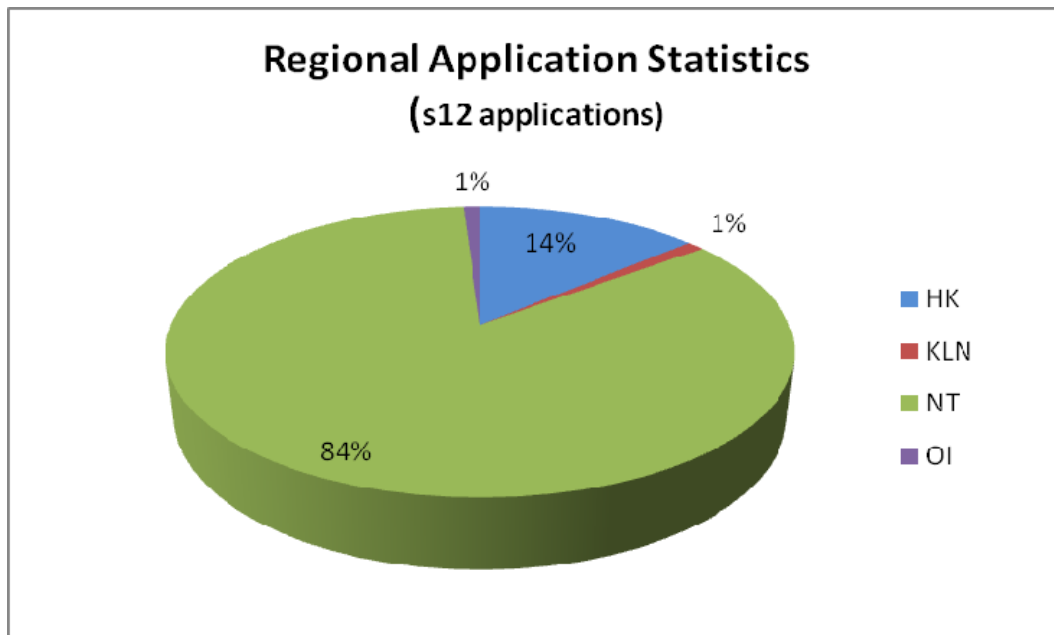
Graph 3 – <u>Regional Statistics of s12a Application in GB Zones</u> [12]
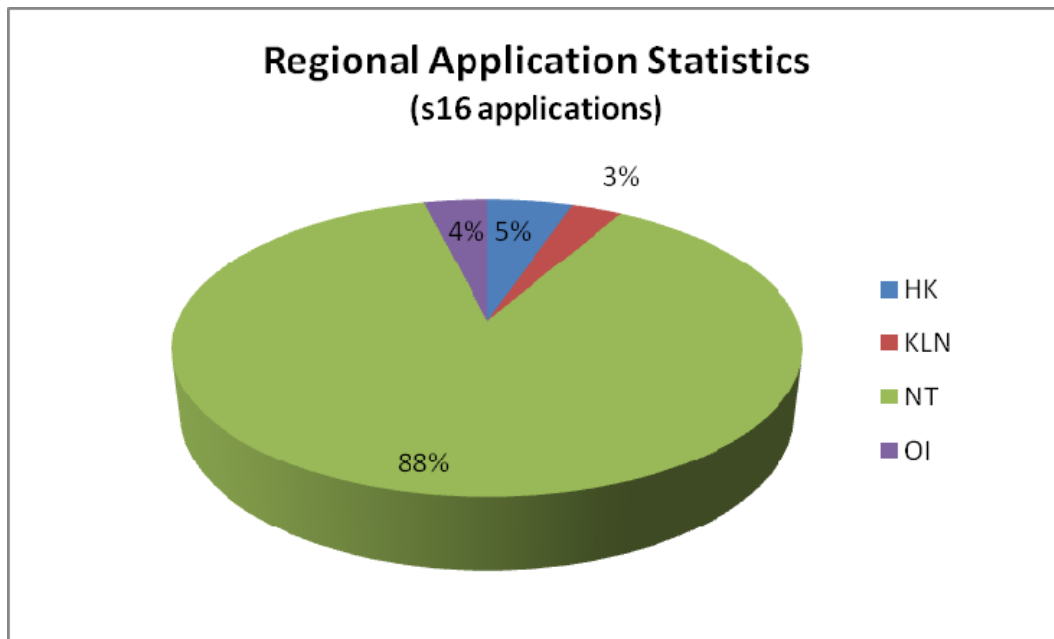
Graph 4 – <u>Regional Statistics of s16 Application in GB Zones</u> [13]

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[12] For the detail figures, please refer to the Table 19 in Appendix 2

[13] For the detail figures, please refer to the Table 20 in Appendix 2

From the graphs shown, the locations of the two types of applications are largely similar.   More than 80 % of both column 2 uses and rezoning requests are situated in the NT.   While for other regions, the variations are not significant, albeit there are differences between the figures.   Hence, by the simple aggregate analysis, the locational factor is insignificant to explain the differences in the approval rate of the decisions.

Apart from the location, the applied uses may also pose an effect on the approval rate.   Therefore, the average approval rates of some major specific uses are studied to examine whether the TPB has particular favor and bias.

The following graphs show the proportion of approved cases over the total number of applications.   The cases are ranked from left to right to indicate the uses yielding the highest approval rate to the lowest one.
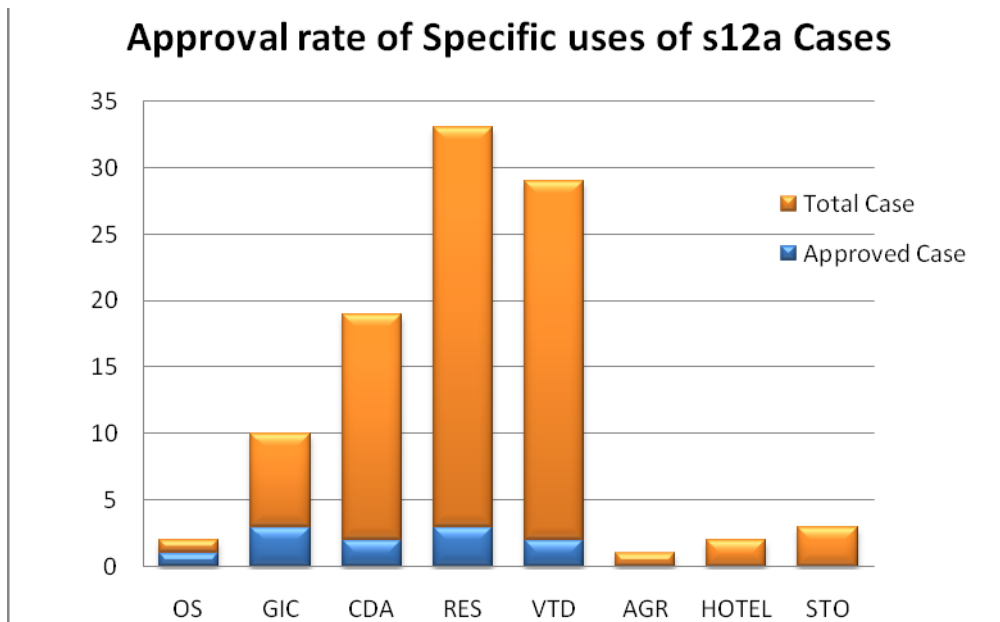
Graph 5 – <u>Average success rates of s12a applications for specific uses in GB Zones</u>[14]
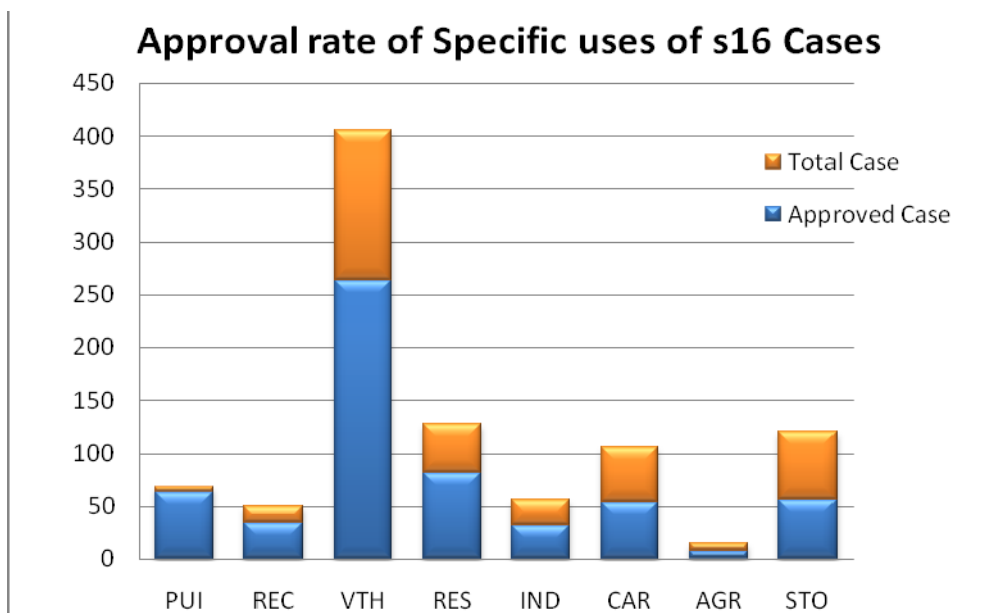
Graph 6 – <u>Average success rates of s16 applications for specific uses in GB Zones</u>[15]

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[14] For the detail figures, please refer to the Table 21 in Appendix 2

[15] For the detail figures, please refer to the Table 22 in Appendix 2

S12a applications		S16 applications	
Uses	Approval Rate	Uses	Approval Rate
GIC	33.33%	PUI	92.65%
OS	25.00%	REC	68.00%
CDA	11.11%	VTH	65.19%
RES	9.68%	RES	63.28%
VTD	6.90%	IND	57.14%
AGR	0.00%	CAR	50.94%
HOTEL	0.00%	AGR	46.67%
OST	0.00%	OST	46.67%

Table 5 – Ranking of the average success rate for major specific uses of the

s12a and s16 applications in GB Zones

From the graphs and tables shown, all the applied uses in the s16

applications got a higher approval rate than the s12 applications one.

Despite the fact, the uses yielding the highest and lowest approval rate in

both type of development applications are the same.   GIC in s12a

applications and Public Utilization Installations (PUI) in s16 applications, are related to the public uses which gains the highest approval rate. This is justified by promoting interest to the general public. On the other hand, the OST uses suffered from the lowest success rate in both applications.

It is revealed that the VTH development is more likely to be approved than the RES in planning application. However, the result is reversed in the rezoning applications. It shows the inconsistency between the decisions of the TPB in two types of applications.

Notwithstanding this explicit result, even it is applied to the same uses for the two applications; the other details of the proposal may different from each other. Hence, a direct comparison of the average rate is meaningless. There should be some mechanism to adjust the weight and variables so that a comparison given between the two type of applications.

More importantly, there are flaws in the conclusion of the aggregate study. Superficially, the success rate difference for s12a and s16 applications is vast. However, the aggregate method used to calculate the average success rates is not comprehensive. It cannot reveal the significance of the characteristics of each application which will affect the success rate. As the characteristics, ie. location, SA, proposed GFA and applied uses are different, these factors may integrate and contribute to a higher failure rate to the rezoning applications instead of the application types.

Also, as there is a large gap between the number of applications, it is biased against the s12 applications from the beginning in calculating the approval rate. In order to yield an unbiased result, the probit study which is an aggregate analysis, will be used to test the altitude of TPB towards approving the s12a and s16 applications.

Probit analysis

The probit model offers a more comprehensive analysis. Hence, this econometric model, with non-aggregate data, will be applied in the empirical study.

According to the content of the hypotheses, two models will be set for assaying the s16 and s12 applications respectively. The variables of the s16 applications will be test first, followed by the s12a one. An analysis will then be made at the end to integrate the result of the two models in order to investigate the consistency between the two types of applications.

Set A- Model testing s16 Applications

For the 1031 sets of data, 125 observations were excluded by the computer programme "EView 6.0" automatically due to missing information of site area and the elimination of the applications in OI due to the irrelevancy of the model testing.   As a result, a total of 906 sets of data were tested.   Table 5 and 6 shows the results after all the variables were inserted into the equation for the probit analysis.

Zone	N	β_0	NT	GFA	DATE	VTH	RES	GIC + OS + ROAD	STO	Log - Likelihood	Percentage correct prediction
GB	906	0.61768* (2.98676)	-0.52040* (-2.77147)	1.9E-06 (1.42584)	0.06866 (0.76270)	0.28495** (2.04555)	0.14115 (0.89511)	0.21353 (1.60438)	-0.21832 (-1.31523)	-595.647	24.05%

*   Statistically significant at 1% confidence level   **   Statistically significant at 5% confidence level

Table 6 – <u>Probit analysis of s16 applications – First Test</u>[16]

Zone	N	β_0	NT	SA	DATE	VTH	RES	GIC + OS + ROAD	STO	Log - Likelihood	Percentage correct prediction
GB	906	-0.16418* (2.70833)	-0.54547* (-2.88982)	2.2E-06*** (1.72860)	0.04611 (0.50472)	0.35174** (2.45110)	0.17238 (1.07512)	0.28297** (2.08270)	-0.16418 (-0.96868)	-583.876	26.89%

*   Statistically significant at 1% confidence level   **   Statistically significant at 5% confidence level

*** Statistically significant at 10% confidence level

Table 7 – <u>Probit analysis of s16 applications – Second Test</u>[17]

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[16] For the detail figures, please refer to the Table 23 in Appendix 3

[17] For the detail figures, please refer to the Table 24 in Appendix 3

Test Specification

Two tests have been run respectively to see whether the SA or GFA is a decisive criterion for the decisions of the TPB. The reason for not integrating both SA and GFA variables into the same equation is that they are fundamentally the same. Both of them are used to measure the development scale. The only difference is that SA measures the size and extent of the development while GFA measure the density of the development. Hence, if the two variables are studies within the same equation, the effect of the variables will be diluted and their explanatory power towards the likeliness of getting planning approval may then be weaken.

For the two tests, as shown by Table 5 and 6, GFA are found to be insignificant to affect the decision of the TPB. The variable SA in the second model is significant instead. It implied that the TPB may use SA as a proxy of the scale of development instead of GFA in the GB case. Hence, although SA is not as effective as proposed GFA to show the scale of development, the second instead of the first test will be chosen for

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testing our hypothesis.

Interpretation of the variables

Locational Variable (NT)

As benchmarked by the region of HK and KLN, the negative coefficient of NT, which is significant at 1 % level, indicating that planning applications made in this broad region, when compared with the others, would be more likely to be rejected. Therefore, it does not contribute to the refutation of Hypothesis I. Planning applications made in the old urbanized areas were easier to get approvals and those in sub urban and rural GB zones had a higher.

Size Variable (SA)

To the astonishment, the variable SA is found to be significantly affected the success rate of the s16 application in a positive manner at the 10% confidence level. It signified that the larger the site, the easier to be granted a planning permission. The Hypothesis II is already refuted

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under the portion of s16 applications. The decision of TPB is not in line with the general principle of "presumption against development" and "limited development".

More importantly, there is a *prima facie* evidence to support the argument that the TPB support the rent-seeking practices. Proposals with greater SA usually involve a larger scale of development by larger developers and more capital. The more resourceful developers gain the upper hand in having a higher approval rate of the planning applications in GB zones due to their strong bargaining power and greater investment poured into the proposal. Evidences did show that the TPB's decisions may be influenced by rent-seeking motives, and that is why it prefers larger developments in GB zones.

Uses Variables

As mentions there are four variables related to uses will be test to cross-examine three hypotheses.

VTD and RES

For VTH development, the coefficient is positive and significant at 5%. This suggests that planning applications for VTD in GB zone in any locations are associated with a greater likelihood of being approved by the TPB. This is in line with the conclusion of Lai and Ho (2001a) and Ip (2005).

While for the RES, although the coefficient is positive, it is insignificant. Hence, the use is not associated with a greater chance of being approved.

Therefore, comparing VTH with RES, it is a more preferred uses for the TPB. That means the Hypothesis III is not yet refuted.

[GIC+OS+ROAD]

The coefficient of [GIC+OS+ROAD] is found to be positive and significant at 5% level. This verified the hypothesis of uses used to

promote general benefit to the public are more likely to obtain planning permission is not yet refuted.

Out of the blue, the coefficient of the dummy VTH is larger than the [GIC+OS+ROAD] one.   In other words, the VTD uses even have a higher probability than the [GIC+OS+ROAD] to receive a use changing approval. Then, the conclusion will then be in ambiguous as VTH is a kind of private uses which only benefit to a few occupants instead of the general public. Therefore, if to hold the hypothesis of inclination to public uses by the TPB in term of decision in planning permissions valid, the VTH uses should be excluded.   The reason is that the determination of the TPB may also affected by other exogenous policies such as the "small house policy" which is exclusively for the indigenous villagers.

Nonetheless, the Hypothesis V is not yet refuted in this part.

OST

Surprisingly, the coefficient of OST is not significant. This indicates that the TPB does not discriminate against applications for open storage uses, and meant that it does not intend to phase out these incompatible and non-conforming uses. Part of the Hypothesis IV is refuted. The results for OST from the probit analysis is contradicted the aggregate results. That means, the relatively low success rate in applying for the OS use may due to other factors such as the location and size factors.

Date Dummy

The date dummy is an attempt to eliminate the possible influence of the incorporation of the s12a of TPO to the decision of the TPB. The insignificance of the DATE variable shows that regardless of the imposition of the endogenous policy, the consideration of the TPB towards the planning application remains unchanged.

There is neither advantage nor disadvantage for the cases in different periods in obtaining the planning permissions.

Set B - Model testing s16 Applications

For the 95 set of data, only 29 and 39 data sets are applicable for the tests of GFA and SA respectively.   The large scale discard of data sets is due to the deferred decision, missing site area of the applications.   Also, the only application in Outlying Island is removed as it is irrelevant to the model testing.   More importantly, as mentioned previously, the applications before 1 June 2005 are confidential and details are not disclosed to the public.   Thus, models of the details cannot be gathered.

Table 7 and 8 shows the results after all the variables were inserted into the equation for the probit analysis.

Zone	N	β_0	NT	GFA	DATE	VTH	RES	GIC + OS + ROAD	STO	Log - Likelihood	Percentage correct prediction
GB	21	17.0157 (N/A)	-24.7660 (N/A)	1.77E-05 (N/A)	3.9542 (N/A)	N/A	-20.6635 (N/A)	0.7408 (N/A)	0.5102 (N/A)	-2.2474	80.5%

Table 8 – <u>Probit analysis of s12a applications – First Test</u>[18]

Zone	N	β_0	NT	SA	DATE	VTH	RES	GIC + OS + ROAD	STO	Log - Likelihood	Percentage correct prediction
GB	39	2.69736 (1.90394)	-3.23902* (-2.88982)	6.22E-06 (1.55117)	-1.40347 (-1.52614)	1.05297 (0.98560)	-1.53411** (-1.79790)	-0.41184 (-0.78665)	N/A	-13.0532	43.74%

*   Statistically significant at 1% confidence level   **   Statistically significant at 10% confidence level

Table 9 – <u>Probit analysis of s12aapplications – Second Test</u>[19]

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[18] For the detail figures, please refer to the Table 25 in Appendix 3

[19] For the detail figures, please refer to the Table 26 in Appendix 3

<u>Test Specification</u>

Using the same logic with the Model Testing of Set A (s16 applications), two individual tests will be run to check the influence of the SA or GFA towards the decisions of the TPB.

Referring to Table 7 which is used to test the influence of GFA, it is found that the P-value and the probabilities of getting the related co-efficient cannot be figured out by the computer.   The variables are found to be inter-related and their sole effect on the approval rate cannot be determined.   It is because there are too little available observations to support the running of the test.   Hence, it is impossible to use the result of the first test to draw any conclusion as the influence of the factors is not shown.

Also, during the data gathering processes, it is found that many applicants did not provide the proposed GFA in the rezoning proposal. Moreover, in the summary notes drew by the TPB, many of them was neglected to fill in the column of GFA.   The administration of the TPB has further implied that GFA is not an essential criterion for the Board to decide the approval for rezoning as the notes is designed to provide an

overlook of the case for the Broad members.

Hence, due to the inadequacy of the information for GFA, SA is the only mean to test the size impact of the development towards the TPB decisions.

Interpretation of the variables

Locational Variable (NT)

The result for the set B is same as the set A. The variable NT is found to be negatively affecting the approval rate of rezoning, significant at 1% level. Therefore, the Hypothesis I is still not refuted. Rezoning applications made in more difficult in the sub-urban and rural areas compared with the old urbanized areas, including the HK and KLN regions.

Size Variable (SA)

Despite the coefficient of SA is positive, it is found to be insignificant. It indicated that the development size, measured in terms

of SA or GFA, does not have a significant impact on the TPB's decision in the GB zones. The TPB does not take the development size as a major factor in determining whether an application should be approved. Hence, the Hypothesis II is not refuted as there is no bias to the larger development. The 'limited development' policy is then ambiguous as there is no mean to check the ruin of the GB areas.

Uses Variables - VTD and RES

For the variable of VTH development, the positive coefficient is insignificant. This suggests that rezoning applications for VTD zones from GB zones do not exert a positive influence on the decision of the TPB. This finding is not in line with the "green house policy" as set by the government.

While for the RES, the coefficient is negative and significant. Hence, the use is biased by the TPB and the rezoning application is deemed to be failure as it is associated with a smaller chance of being approved. The discrimination may due to the denser and more bulky residential development by the ordinary residential development, which may cause significant damage to the natural environment.

Thus, when RES is compared with VTH, it has a lesser chance to be approved than VTH, albeit the TPB do not have special preference to the VTH zone.   Therefore, the Hypothesis VIII is still valid.

Uses Variable - OST

The variable OST is excluded from the estimated function for the s12a application as there are only 3 applications for the use since 1998 and all of them are rejected by the TPB.   Hence, this variable is perfectly estimated for the value of 0 (rejected).   The Hypothesis IX is left untested.

Uses Variables - [GIC+OS+ROAD]

The coefficient of [GIC+OS+ROAD] is found to be insignificant in a negative manner.   The Hypothesis X is refuted by the TPB decision's on s12a application.   Any developments, regardless for private or public uses, are discarded from the GB zones by the TPB.   It implied that the general rule of "presumption against development" overwhelmed the aims of promoting general welfare to the public.

It is thought surprising that the TPB defends so strongly conservation areas which are zoned in GB.   This contrasts with their lack of concern about the physical scale of such proposed developments.

Date Dummy

The date dummy is an attempt to eliminate the possible influence of the incorporation of the s12a of TPO to the decision of the TPB.   Although the public can voice their opinion towards to existing plans and apply for amendment before the legislation come into effective, there are no explicit means or formal guidelines for the populace to follow.

The insignificance of the DATE variable shows that regardless of the imposition of the endogenous policy, the consideration of the TPB towards the rezoning application remains unchanged.   Instead, it is just a matter of administrative procedures for submitting the rezoning proposal.

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Hypothesis Analysis

The empirical results of the 2 models will be compared in order to generate a holistic approach for testing the validity of the hypotheses and checking if the rezoning policy is in tune with the planning permission decision.

Hypothesis I (Locational Factor)

The validity of the Hypothesis I justified that the chance of success in obtaining development permissions in both applications under s12a and s16 in sub-urban and rural areas (NT) is found to be lower than that in the old urban areas (KLN and HK).   Hence, both of them are in line with the overall GB strategies.

The TPB's view over both s12a and s16 applications is that they are mutually consistent.

Hypothesis II (Size Factor)

It is expected that the TPB will oppose the mega development as it will cause massive destruction to the natural environment.   However,

the variables GFA for s16 applications and SA for s12a applications are found to have an insignificant effect upon TPB's decisions and the SA for the latter even significantly increases the chances of getting approval. Hypothesis II is then refuted.

These results failed to show whether or not the size of the development is a material consideration in assessing a proposed development in GB zones. It is questioned whether the general principle of "limited development" is hold. It may also suggest that the commonly rejected ground of "against planning intention" is merely an excuse to refuse the proposal. There is no actual consideration of the intention of "limited development" in adjudicating the s16 applications.

In short, the TPB's nonchalant and welcoming attitude towards SA in considering rezoning and planning applications respectively are correspondingly highly offensive to the conservation principles in GB zones without imposing a restriction on the development scale.

Hypothesis III (Use Factors)

For the comparison between the RES and VTH uses, both rezoning and planning applications are correspondingly preferred VTH development to RES one. Hypothesis III is not refuted.

It is shown by the VTH uses are more likely to obtain a planning permission than RES uses through s16 applications and the RES uses are less likely to be approved than VTH uses through s12a applications. Although the results are not wrapped up by the same way, they lead to the same conclusion. So, the s12 and s16a applications are mutually consistent, provided that all kinds of proposed residential uses are more difficult to obtain development approval in rezoning applications than planning applications.

Hypothesis IV (Use Factors)

Secondly, the public uses, shown by the variable [GIC + OS + ROAD], have a negligible effect on the approval rates of s12a application but provided a relatively significant positive effect on s16 applications. As the Hypothesis IV is to test whether public uses are more preferred to

private uses in applying development applications, an insignificant result show that there is no advantage for it in rezoning applications.

Moreover, even there is a positive influence of public uses exerted on the planning decision of TPB in s16 applications, it appears to be less likely to be approved than VTH uses, which is a private use. Hypothsis IV is then refuted, despite the fact that the 2 types of development applications are not mutually contradictory.

Hypothesis V (Use Factors)

Last but not least, as the STO uses for s12a applications are left untested, no conclusion can be reached as to the compatibility of the two types of applications. Hypothesis V can neither be verified nor rejected.

All in all, there is no contradiction between the decisions of the TPB on s12a and s16 applications. Despite this fact the absence of contradictory results does not confirm consistency between the two types of applications. Even more importantly, there are only two out of six variables that are found to significantly affect the chance of getting approval in s12a applications. That means that, unlike the s16

applications where there are routines to follow, the TPB decisions towards the rezoning applications are to a large extent random.   There is no defined path for the applicants to follow.

At the same time, the insignificant coefficients of the variables also mean that they are not one of the circumstances in the consideration of the TPB.   That means that there may have some other unobservable variables affecting the decision of the Board such as the name of the applicants.   This further signifies the "black-box operation" of the TPB towards the s12a applications.

Advanced aggregate studies – Case study

Undoubtedly, probit modeling is helpful to draw an unbiased evaluation for accounting the individual effect of each variable to the success rate of the development applications. However, for the s12a application model, the shortcoming of limited data may affect the model's ability to reveal the reality by taking a risk of plotting a skew normal distribution curve which will give a biased interpretation.

After modifying the model in various ways to put to the proof of the significance of the factors, the variable, NT, is found to be the only robust factor that will significantly affect the approval rate in a negative way. The effects of the other variables are uncertain. To deal with the weaknesses of the model, it is suggested that the sample size should be increased by waiting for the government to release the undisclosed data or waiting for a several years to accumulate sufficient cases to run the model again in order to improve the accuracy of the model. Notwithstanding they are the most useful and effective solutions, it is impossible to request the government to change its policy, or otherwise, it takes a long time to wait for collecting enough data.

In order to provide the public some acquaintance with the attitude of the TPB towards the rezoning and planning applications, an advanced aggregate analysis basing on the existing data is suggested.   An attempt will be made on evaluating the cases which have applied both s12a and s16 applications so as to examine the consistency between the two development applications.

Case Study 1

Address	Lot 661 in D.D. 329, 37 San Shek Wan, Lantau	
Content Type	Rezoning/ Amendment of Plan	Planning Permission
Case Number	Y/SLC/1	A/SLC/72
Statutory Plan	S/SLC/14 (South Lantau Coast OZP)	S/SLC/12 (South Lantau Coast OZP)
Proposed Uses	Residential (House)	Residential (House)
Subject of Amendment	Rezoning from "Green Belt" to "Residential (Group C) 1"	Proposed Four Houses
Site area (m²)	847	847
TFA (m²)	564.5	564.1
Plot Ratio	0.6664	0.6664
Decision Meeting	1st August 2008	4th April 2003
Decision	Partially Approved/ partially Agreed	Rejected/ not Agreed
Authority	Rural & NT Planning Committee	

(Source: Rezoning Proposal submitted for s12a application, Planning Enquiries Counter)

Table 10 – Summary Table of the details of the applications

According to the rezoning proposal submitted by the applicant and official record made by the TPB, it is found that the same application applying for residential development in GB Zone of Lantau had go through both s12a and s16 applications.

In 2003, the applicant submitted an s16 application requesting a planning permission for small house development in the subject site. However, the application is rejected for the five following reasons:

(a) the proposed development involving <u>tree felling and extensive vegetation clearance</u> was <u>not in line with the planning intention</u> of the GB zone which was to enhance the protection of the natural landscape and amenity at the edge of Lantau South Country Park. No strong justification had been given in the submission for a departure from the planning intention;

(b) the proposed development with a <u>plot ratio of 0.66 was considered excessive</u> and incompatible with the surrounding natural and rural character;

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(c) the proposed development would affect existing trees and natural vegetation. There was no information to demonstrate that the proposed development would not <u>cause adverse landscape and visual impacts</u> in the area;

(d) the proposed development did not comply with the "Town Planning Board Guidelines for Application for Development within Green Belt Zone" in that the <u>scale and intensity</u> of the proposed redevelopment far exceeded those of the existing development and were not compatible with the character of the surrounding environment; and

(e) the approval of the proposed development would <u>set an undesirable precedent</u> for other similar applications. The cumulative effect of approving such applications would result in encroachment of the "GB" zone by developments and adverse impacts on the landscape, visual character, traffic and infrastructure provision in the area.

The five grounds suggested that the applied development will lead to natural vegetation clearance, which will (1) go against the planning intention and (2) pose an adverse impact to the environment.   Also, the (3) applied development scale is excessive and may (4) set a "bad precedents" to the similar cases.

Five years later with the establishment of the statutory rezoning application mechanism, the applicant submitted the same proposal again to the TPB under the s12a of TPO instead of s16 one.   The TPB made a 180-degree turn in the case by approving the application site rezoned from GB to R(C), subjected to a maximum SC of 25% and a maximum building height of 2 storeys. (i.e. 7.6m)

Although the tightening of the development scale can solve the potential problem by excessive development scale, the remaining rejected reasons for the s6 application are still kept unsolved.

The ground of "going against the planning intention" is the most controversial issue in this case.   As explained by the Board in declining the s16 application, the planning intention of the GB area is to enhance

the protection of the natural landscape by prohibiting tree felling and extensive vegetation clearance. Under this principle, there is no reason for the TPB to make a contradictory decision in the two applications as they are applied for the same site with site area, which will lead to the same scale of deforestation.

More importantly, rezoning to R(C) zone represents a more extensive destruction of the natural environment by always permitting a low-density residential development. Referring to Table 11 and 12, rezoning is totally contradictory to the original planning intention of "presumption against development" to "protect the existing natural vegetation". By rezoning, the original planning intention will be replaced by the planning intention of the new zone. The target is no longer to conserve the environment.

There is no need to discuss the ground of "bad precedent" as it should not be a rejected reason to the planning application. Regarding to Lai (2003), as the TPB is to decide every application on its own merits, the decision in the case will not affect the decision in similar cases and it is doubtful if this case will set an undesirable precedent to the others.

RESIDENTIAL (GROUP C)	
Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

Flat
Government Use (Police Reporting
    Centre, Post Office only)
House
Utility Installation for Private Project
	Ambulance Depot
	Eating Place
	Educational Institution
	Government Refuse Collection Point
	Government Use (not elsewhere specified)
	Hotel
	Institutional Use (not elsewhere specified)
	Petrol Filling Station
	Place of Recreation, Sports or Culture
	Private Club
	Public Convenience
	Public Transport Terminus or Station
	Pubic Utility Installation
	Public Vehicle Park
	    (excluding container vehicle)
	Recyclable Collection Centre
	Religious Institution
	Residential Institution
	Rural Committee/Village Office
	School
	Shop and Services
	Social Welfare Facility
	Training Centre

Planning Intention	
The planning intention of this zone is primarily for low-rise and low-density residential developments.	

Table 11 – <u>Schedule of Use of R(C) Zone in OZP no.S/SLC 14</u>

GREEN BELT	
Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

Agricultural Use
Country Park *
Government Use (Police Reporting
    Centre only)
Nature Reserve
Nature Trail
On-Farm Domestic Structure
Picnic Area
Public Convenience
Public Vehicle Park (for cycles only)
Tent Camping Ground
Wild Animals Protection Area
	Animal Boarding Establishment
	Barbecue Spot
	Broadcasting, Television and/or Film Studio
	Burial Ground
	Columbarium (within a Religious Institution or
	    extension of existing Columbarium only)
	Crematorium (within a Religious Institution or
	    extension of existing Crematorium only)
	Field Study/Education/Visitor Centre
	Golf Course
	Government Refuse Collection Point
	Government Use (not elsewhere specified)
	Helicopter Landing Pad
	Holiday Camp
	House
	Marine Fuelling Station
	Petrol Filling Station
	Pier
	Place of Recreation, Sports or Culture
	Pubic Transport Terminus or Station
	Public Utility Installation
	Public Vehicle Park
	    (not elsewhere specified, excluding
	    container vehicle)
	Radar, Telecommunications Electronic
	    Microwave Repeater, Television and/or
	    Radio Transmitter Installation
	Religious Institution
	Residential Institution
	Rural Committee/Village Office
	School
	Service Reservoir
	Social Welfare Facility
	Utility Installation for Private Project

Table 12 – <u>Schedule of Use of GB Zone in OZP no.S/SLC 14</u>

It is concluded from the case study that the decisions of TPB in s12a and s16 applications clashed with each other.   There is no apparent reason for the contradiction of the "black-box operation" of the TPB.

CHAPTER V
CONCLUSION

Summary

The key objective of this dissertation is to investigate whether the TPB is consistent in its decisions concerning rezoning and planning applications. It attempts to canvass the factors affecting the success rates of the rezoning applications which, to my best knowledge after a thorough library search, have not previously been studied in any town planning literature.

As a first focused attempt, the study is conducted by using an econometric analysis of official development control statistics about rezoning and planning permission application of GB zones in Hong Kong and by following the probit methodology of previous researchers Lai and Ho (2001a, b, c; d; 2002a, b, c; 2003), Chau and Lai (2004), Yung (2001), Ngai (2002), Chan (2003), Yu (2003), Chau and Lai (2004), Chan (2004), Kou (2004), Wan (2004), Ip (2005), Kwok (2005) and Li (2006)..

Five empirical hypotheses are derived for the probit testing in respect to the location, size and use of the proposed development. Empirical findings do not disprove the first hypothesis and affirm that both types of development applications for uses in GB Zones in old urbanized areas appeared to stand a higher chance of approval than the suburban or even rural areas. Also, the validity of the third hypothesis confirmed that VTH uses are preferred over RES uses from the viewpoint of TPB, regardless of the types of development applications.

For the remaining three hypotheses, the tested variables in the rezoning model are found to be insignificant in affecting the success rates of rezoning requests. Although the TPB is proved not to act in an arbitrary manner, the insignificant testing variables show that there are unobserved factors determining the success of the s12a applications. In this light, it was revealed that the decision of approving the s12a application is made under the "black box operation" of the TPB, even though the intent of the legislation of s12 of TPO is to encourage public participation, as stated in the Town Planning (Amendment) Bill 2003.

Moreover, an approved rezoning case in 2008 has been found to be rejected in 2003 under s16 applications.   The decisions of the TPB are self-contradictory and confused the public as to of the standard of development approval.

Thus, it is desirable for the TPB or its overseer to make a systematic review of its decision making outcomes and to increase the transparency of its decision-making process.   These endeavours should lower the transaction costs of development applications, improve the efficiency of the discretionary decision making procedures, strike a balance between certainty and flexibility to protect the private property rights of land, and facilitate a better planning of the community in order to achieve the goal of maximizing economic and social welfare.   As economists, we can hardly model the behavior of bureaucrats and politicians as their constraints are often hard to specify.   Subject to this limitation, this dissertation is the best attempt using publicly available non-aggregate statistics.

Limitations of Study

The major limitation of the research is the constraints in information collection.   As the rezoning application is newly emerged, the number of applications is trivial compared with the planning applications which have been in common use for a long time.   The enormous difference in the number of application will definitely lead to bias in results interpretation.

Moreover, the undisclosed details of rezoning applications before June 2005, including the "site areas" and "gross floor areas", would make many data sets inapplicable.   This will further diminish the data quantity and hamper the significance and accuracy of the probit results.

Further Research

It is important to avoid generalizing the findings as a representation of all development applications in Hong Kong, as this study focused on GB zones only. Nevertheless, it identified new research areas in the issues of planning certainty and flexibility, relationship between endogenous planning and government policies, and interaction between two similar types of development applications. It is hoped that the findings of coincidence between the planning and rezoning applications would kindle a new interest in new town study and provide additional grounds to make planning research more fruitful.

APPENDICES

APPENDIX 1

S16 APPLICATIONS APPLIED USES AND THEIR

AFFILIATED ZONES

	Zones	Column 1 Uses

1	Government, Institution or Community (GIC)	- Market
		- Field Study/ Education Centre
		- Government Refuse Collection Point
		- Religious Institution
		- School
		- Public Transport Terminus
		- Film/ Television Studio
		- Exhibition Hall/ Centre
		- Public Vehicle Park
		- Training Centre
		- Wholesale Trade
		- Library
		- Recyclable Collection Centre
		- Public Utility Installation
		    - Pump House
		    - Angle Station, Support Towers and Cable Car Route
		    - Television Transmitter Installation
		    - Television Transposer Station
		    - Electricity Substation
		    - Radar, Telecommunications Electronic Microwave Repeater
		    - Sewage Treatment Plant
		    - Reservoir
		    - Marker Rope and Related Anchorage Structure for Cable Car
		    - Mobile Communication Radio Base Station
		- Social Welfare Facility
		    - Drug Rehabilitation and Recreation Centre

2	Village Type Development (VTD)	- Agricultural Use - New Territories Exempted House (Small House) - Religious Institution
3	Residential (RES)	- House - Residential Development - Utility Installation for Private Residential Project
4	Open Space (OS)	- Park and Garden - Field Study/ Education Centre
5	Road (ROAD)	- Road

6	Recreation (REC)	- Agricultural Use
		- Barbecue Spot
		- Field Study/ Education Centre
		- Holiday Camp
		- Club
		- Place of Recreation, Sports or Culture
		    - Golf Driving Range
		    - Golf and tennis academy

7	Agricultural (AGR)	- Agricultural Use - Plant Nursery
8	Green Belt (GB)	- Agricultural Use - Country Park - Barbecue Spot - Nature Reserve - Tree Plantation
9	Conservation Area (CA)	- Fish Pond Culture - Country Park - Nature Reserve
10	Industrial (IND)	- Cargo Handling and Forwarding Facility - Warehouse (excluding Dangerous Goods Go-down) - Vehicle Repair Workshop - Research, Design and Development Centre
11	Other Other Specified Uses (OOS)	- Grave - Cemetery - Columbarium - Container Storage - Open storage - Private Wine Club with Ancillary Cellars
12	Comprehensive Development Area (CDA)	- Proposed Comprehensive Residential and Recreational Development including Government, Institution and Community Facilities
13	Commercial (COM)	- Hotel - Retail - Office
14	Storage (STO)	- Open Storage - Container Storage

Table 13 – List of the s16 applied uses and their affiliated zones

APPENDIX 2

STATISTICS OF S12(A) AND S16 APPLICATIONS

1   Annual Application Statistics (1998-2009/3)

YEAR	No. of cases	Application rate
1998	13	13.68%
1999	9	9.47%
2000	11	11.58%
2001	6	6.32%
2002	3	3.16%
2003	10	10.53%
2004	5	5.26%
2005	8	8.42%
2006	5	5.26%
2007	4	4.21%
2008	19	20.00%
2009*	2	2.11%
Total	95	100.00%

Table 14 – Number of s12a Application Green Belt Zones

YEAR	No. of cases	Application rate
1998	124	12.03%
1999	72	6.98%
2000	76	7.37%
2001	79	7.66%
2002	106	10.28%
2003	110	10.67%
2004	69	6.69%
2005	111	10.77%
2006	92	8.92%
2007	74	7.18%
2008	104	10.09%
2009*	14	1.36%
Total	1031	100.00%

Table 15 – Number of s16 Application Green Belt Zones

2   Annual Approval Rate

YEAR	s12a applications	s16 application
1998	7.69%	57.26%
1999	44.44%	79.17%
2000	9.09%	57.89%
2001	0.00%	73.42%
2002	0.00%	70.75%
2003	20.00%	53.64%
2004	0.00%	55.07%
2005	0.00%	63.06%
2006	0.00%	69.57%
2007	25.00%	72.97%
2008	5.26%	61.54%
2009*	0.00%	42.86%
Total	10.53%	64.02%

Table 16 – Approval rate of s12 and s16 Applications in Green Belt Zones

YEAR	Rejected	Approved	Partially Approved	Rejected but proposed other amendment	Deferred	TOTAL
1998	12	1	0	0	0	13
1999	5	4	0	0	0	9
2000	9	1	1	0	0	11
2001	6	0	0	0	0	6
2002	2	0	1	0	0	3
2003	7	2	1	0	0	10
2004	5	0	0	0	1	6
2005	8	0	0	0	0	8
2006	2	0	2	1	0	5
2007	3	1	0	0	0	4
2008	11	1	2	0	3	17
2009*	0	0	0	0	2	2
Total	70	10	7	1	6	94

Table 17 – Decision made to s12 Application Proposal in Green Belt Zones

YEAR	Rejected	Approved	Approved with Conditions	AC at temporary basis	Partially Approved	Abandoned	Deferred	Dismissed	Revoked	TOTAL
1998	53	23	33	15	0	0	0	0	0	124
1999	15	0	32	25	0	0	0	0	0	72
2000	32	2	34	8	0	0	0	0	0	76
2001	21	17	35	6	0	0	0	0	0	79
2002	31	24	47	4	0	0	0	0	0	106
2003	44	14	35	10	0	1	1	3	2	110
2004	26	4	31	3	0	0	2	0	3	69
2005	35	24	41	5	0	0	3	2	1	111
2006	23	21	37	6	3	0	2	0	0	92
2007	16	9	34	11	0	1	0	3	0	74
2008	36	14	43	7	0	0	3	0	1	104
2009*	6	0	4	2	0	0	2	0	0	14
Total	338	152	406	102	3	2	13	8	7	1031

Table 18 – <u>Decision made to s16Application Proposal in Green Belt area</u>

3   Regional Application Statistics

YEAR	HK	KLN	NT	LANTAU	TOTAL
1998	1	0	12	0	13
1999	2	0	7	0	9
2000	1	1	9	0	11
2001	0	0	6	0	6
2002	1	0	2	0	3
2003	0	0	10	0	10
2004	0	0	5	0	5
2005	1	0	7	0	8
2006	2	0	3	0	5
2007	2	0	2	0	4
2008	3	0	15	1	19
2009	0	0	2	0	2
Total	13	1	80	1	95

Table 19 – Regional Statistics of s12a Application in Green Belt Zones

YEAR	HK	KLN	NT	LANTAU	TOTAL
1998	8	3	107	6	124
1999	6	1	63	2	72
2000	3	1	68	4	76
2001	6	4	67	2	79
2002	6	5	92	3	106
2003	6	6	90	7	109
2004	4	1	60	4	69
2005	6	7	90	8	111
2006	2	0	89	1	92
2007	2	1	69	2	74
2008	4	2	98	1	105
2009*	1	1	12	0	14
Total	54	32	905	40	1031

Table 20 – <u>Regional Statistics of s16 Application in Green Belt Zones</u>

4   Specific Uses Statistics

Applied Uses	Total Applications	Approved Cases	Success Rate
OS	2	1	50.00%
GIC	10	3	30.00%
CDA	19	2	10.53%
RES	33	3	9.09%
VTD	29	2	6.90%
HOTEL	2	0	0.00%
AGR	1	0	0.00%
STO	3	0	0.00%

Table 21 – Ranking of Average success rates of s12a applications for

specific uses in Green Belt Zones

Applied Uses	Total Applications	Approved Cases	Success Rate
PUI	68	63	92.65%
REC	50	34	68.00%
VTH	405	264	65.19%
RES	128	81	63.28%
IND	56	32	57.14%
CAR	106	54	50.94%
AGR	15	7	46.67%
STO	120	56	46.67%

Table 22 – <u>Ranking of Average success rates of s16 applications for</u>

<u>specific uses in Green Belt zones</u>

APPENDIX 3

MODEL TESTING RESULTS

Dependent Variable: Y
Method: ML - Binary Probit (Quadratic hill climbing)
Date: 03/13/09   Time: 13:46
Sample: 1 966 IF LANTAU=0
Included observations: 906
Convergence achieved after 6 iterations
Covariance matrix computed using second derivatives

Variable (x)	Coefficient	Std. Error	z-Statistic	Prob.
NT	-0.520396	0.187769	-2.771466	0.0056
GFA	1.91E-06	1.34E-06	1.425840	0.1539
DATE	0.068656	0.090017	0.762704	0.4456
VTH	0.284954	0.139304	2.045547	0.0408
RES	0.141151	0.157691	0.895111	0.3707
GIC+OS+ROAD	0.213529	0.133091	1.604383	0.1086
STO	-0.218318	0.165991	-1.315233	0.1884
C	0.617677	0.206805	2.986764	0.0028

McFadden R-squared	0.024046	Mean dependent var	0.631068
S.D. dependent var	0.482776	S.E. of regression	0.477034
Akaike info criterion	1.302366	Sum squared resid	209.1293
Schwarz criterion	1.344066	Log likelihood	-595.6467
Hannan-Quinn criter.	1.318273	Restr. log likelihood	-610.3228
LR statistic	29.35220	Avg. log likelihood	-0.642553
Prob(LR statistic)	0.000125		

Obs with Dep=0	341	Total obs	906
Obs with Dep=1	565		

Table 23 – Probit analysis of s16 applications – First Test

Dependent Variable: Y
Method: ML - Binary Probit (Quadratic hill climbing)
Date: 03/12/09   Time: 21:59
Sample: 1 966 IF LANTAU=0
Included observations: 906
Convergence achieved after 6 iterations
Covariance matrix computed using second derivatives

Variable (x)	Coefficient	Std. Error	z-Statistic	Prob.
NT	-0.545474	0.188757	-2.889815	0.0039
SA	2.22E-06	1.29E-06	1.728597	0.0839
DATE	0.046111	0.091359	0.504718	0.6138
VTH	0.351743	0.143504	2.451095	0.0142
RES	0.172377	0.160332	1.075124	0.2823
GIC+OS+ROAD	0.282972	0.135868	2.082703	0.0373
STO	-0.164183	0.169493	-0.968676	0.3327
C	0.564299	0.208357	2.708333	0.0068

McFadden R-squared	0.026891	Mean dependent var		0.623620
S.D. dependent var	0.484745	S.E. of regression		0.478091
Akaike info criterion	1.306570	Sum squared resid		205.2569
Schwarz criterion	1.349033	Log likelihood		-583.8760
Hannan-Quinn criter.	1.322786	Restr. log likelihood		-600.0111
LR statistic	32.27030	Avg. log likelihood		-0.644455
Prob(LR statistic)	0.000036			

Obs with Dep=0		341	Total obs	906
Obs with Dep=1		565		

Table 24 – <u>Probit analysis of s16 applications – Second Test</u>

166

Dependent Variable: Y
Method: ML - Binary Probit (Quadratic hill climbing)
Date: 03/22/09   Time: 16:27
Sample (adjusted): 4 95
Included observations: 21 after adjustments
Convergence achieved after 83 iterations
WARNING: Singular covariance - coefficients are not unique
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
NT	-24.76602	NA	NA	NA
GFA	1.77E-05	NA	NA	NA
DATE	3.954156	NA	NA	NA
RES	-20.66346	NA	NA	NA
GIC+OS+ROAD	0.740819	NA	NA	NA
STO	0.510215	NA	NA	NA
C	17.01571	NA	NA	NA

McFadden R-squared	0.805020	Mean dependent var	0.238095
S.D. dependent var	0.436436	S.E. of regression	0.237661
Akaike info criterion	0.880706	Sum squared resid	0.790758
Schwarz criterion	1.228880	Log likelihood	-2.247411
Hannan-Quinn criter.	0.956269	Restr. log likelihood	-11.52636
LR statistic	18.55790	Avg. log likelihood	-0.107020
Prob(LR statistic)	0.004979		

Obs with Dep=0	16	Total obs	21
Obs with Dep=1	5		

Table 25 – <u>Probit analysis of s12a applications – First Test</u>

Dependent Variable: A
Method: ML - Binary Probit (Quadratic hill climbing)
Date: 03/22/09   Time: 14:30
Sample (adjusted): 4 95
Included observations: 39 after adjustments
Convergence achieved after 8 iterations
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
NT	-3.239018	1.252218	-2.586625	0.0097
SA	6.22E-06	4.01E-06	1.551172	0.1209
TIMEDUMMY	-1.403469	0.919617	-1.526144	0.1270
RES	-1.534108	0.853279	-1.797898	0.0722
VTH	1.052970	1.068357	0.985597	0.3243
GIC+OS+ROAD	-0.411849	0.523545	-0.786654	0.4315
C	2.697360	1.416728	1.903936	0.0569

McFadden R-squared	0.437368	Mean dependent var	0.282051
S.D. dependent var	0.455881	S.E. of regression	0.374660
Akaike info criterion	1.028371	Sum squared resid	4.491849
Schwarz criterion	1.326959	Log likelihood	-13.05324
Hannan-Quinn criter.	1.135502	Restr. log likelihood	-23.20033
LR statistic	20.29418	Avg. log likelihood	-0.334698
Prob(LR statistic)	0.002454		

Obs with Dep=0	28	Total obs	39
Obs with Dep=1	11		

Table 26 – <u>Probit analysis of s12a applications – Second Test</u>

Bibliographies

Aldrich, J. H. and Nelson, F. D. 1984. *Linear probability, logit, and probit models*. California: Sage Publications.

Amemiya, T. 1981. *Qualitative response models: A survey*. Journal of Economics Literature 19: 1493-1536.

Anderson, S., Bankier, A. T., Barrell, B. G., De Bruijn, M. H. L., Coulson, A. R., Drouin, J., Eperon, I. C., Nierlich, D. P., Roe, B. A., and Sanger, F.. 1981. *Sequence and organization of the human mitochondrial genome*. *Nature* 290 (5806): 457-465

Applebaum, D. 2008. *Probability and information: An integrated approach.* Cambridge: Cambridge University Press.

Au, H. F. 1997. *The role of land use planning in nature conservation in Hong Kong*. Hong Kong: Unpublished MSc (Environmental Management) Thesis, The University of Hong Kong.

Babcock, R. F. 1977. *The zoning game: Municipal practices and policies*. Madison: University of Wisconsin Press.

_____. 1979. *Zoning*. The practice of local government planning :416-443.

Blacksell, M. and Gilg, A. W. 1977. *Planning control in an area of outstanding natural beauty*. Social Policy & Administration 11 (3):206-215.

Bliss, C. I. 1934. *The method of probits*. Science 79 (2037).

Branch, M. C. 1985. *Comprehensive city planning: Introduction & explanation*. American Planning Association. Washington D.C.: American Planning Association.

Bristow, M. R. 1984. *Land-use planning in Hong Kong: History, policies and procedures*. Hong Kong: Oxford University Press.

Chan, K. M. 2004. *A critical analysis of the consistency between zoning policy and development: probit modeling of open storage uses in Hong Kong*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Chan, K. W. 2003. *Development control in agriculture zones: a probit analysis of Hong Kong planning statistics*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Chan, T. Y. 2006. *A probit analysis of planning application statistics on minor relaxation of development restrictions on Hong Kong Island*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Chau, K. W. and Lai, L. W. C. 2004. *Planned conversion of rural land: A case study of planning applications for housing and open storage uses in agriculture zones. Environment and Planning B: Planning and Design* 31(6): 863-878.

Chau, K. W., Lai, L. W. C. and Hammer, A. M. 1996. *An economic analysis of the 1996 town planning bill.* Hong Kong: unpublished research monograph, Centre of Real Estate and Urban Economics, The Department of Real Estate and Construction, The University of Hong Kong.

Chiu, T. S. S. 2002. *Economic inquiry on planning: a case study of recreation zoning in Hong Kong.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Coase, R. H. 1937. *The nature of the firm.* Economica 4(16): 386-405.

_____. 1959. *The Federal Communications Commission.* The Journal of Law and Economics 2: 1-40.

_____. 1960. *The problem of social cost.* Journal of Law and Economics 3: 1-44

Cooray, A. 1997. *Recent developments in planning law.* Law Lectures for Practitioners 1: 135-160.

Cramer, J. S. 2003. *The origins and development of the logit model*. Manuscript, University of Amsterdam and Tinbergen Institute.

Crown Lands and Survey Office (Colony Outline Planning Team). 1966. *Colony outline plan*. Hong Kong: Government Printer.

Civic Exchange. 2006. *The user's guide to the town planning process: How the public can participate in the HongKkong planning system*. Hong Kong: Civic Exchange, National Democreatic Institute.

Daganzo, C. 1979. *Multinomial probit: The theory and its application to demand forecasting*. New York: Academic Press.

Department of Environment. 1972. *How do you want to live? A report on human habitat*. London: HMSO.

Evans, B. and Blowers, A. 1997. *Town planning into the 21st century*. London: Routledge.

Faludi, A. 1986. *Flexibility in US zoning: A European perspective*. Environment and Planning B: Planning and Design 13: 255-278.

_____. 1987. *A decision-centred view of environmental planning*. Oxford: Pergamon Press.

Finney, D. J. 1944. *The application of the probit method to toxicity test data adjusted for mortality in the controls*. Annals of Applied Biology 31(1): 68-74.

_____. 1971. *Probit analysis: A statistical treatment of the sigmoid response curve*. Cambridge, England: University Press.

Fischel, W. A. 1978. *A property rights approach to municipal zoning*. Land Economics 54(1): 64-81.

Fong, K. 1998. *An analysis of section 16 applications for private uses in government/ institution/ community zones*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Friedmann, J. 2006. *Insights into planning in three east-asian cities*. Town Planning Review 77(3)

Fung, K. Y. 2004. *Modeling town planning statistics for the Mai Po buffer zones in Hong Kong*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Getzels, J. and So, F. S. 1988. *The practice of local government planning*. International City Management Association.

Gilg, A. W. and Kelly, M. 1996. *The analysis of development control decisions. A position statement and some new insights from recent research in south-west England.* Town Planning Review 67(2): 203-28.

Greed, C. 1996. *Introducing town planning.* Harlow, Essex: Longman.

Haar, CM. 1984. *Cities, law, and social policy: Learning from the British.* Lincoln institute of land policy: Lexington Books.

Home, R. 2007. *Land readjustment as a method of development land assembly: A comparative overview.* Town Planning Review 78(4)

Hong Kong Law. 2005. *Town planning ordinance (Chapter 131, Section 3).* Hong Kong: Government Printer

Hui, C. W. 1998. *The re-examination of green belt areas in Hong Kong: a case study of Tuen Mun.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Ip, T. Y. T. 2005. *Development control in Hong Kong's new towns: a probit analysis of green belt zones planning application statistics.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Irving, R. T. A. and Leung, K. W. 1987. *Land-use and land-use change in the reclaimed coastal areas of deep bay.* Hong Kong: Centre of Urban Studies and Urban Planning, The University of Hong Kong.

Jarvie, I. C. and Agassi, J. 1969. *Hong Kong: A society in transition: Contributions to the study of Hong Kong society.* London: Routledge & Kegan Paul.

Jima, C. Y. 1997. *Rural blight and land use planning in Hong Kong.* The Environmentalist 17(4): 269-281

Keeble, LB. 1952. *Principles and practice of town and country planning*: Estates Gazette Limited.

Kou, Y. F. 2004. *Mai Po: Modeling town planning application statistics for the Mai Po Buffer Zones in Hong Kong.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Kwan, K.Y. 2002. *Modeling planning application statistics in Hong Kong: A probit analysis of zone separation of unspecified use and industrial (Group D) zones.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Kwok, K. W. 1999. *An empirical study of Hong Kong zoning system*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Kwong, W. C. 2005. *Probit analysis of planning statistics on case study zone separation between other specified annotated business zones and industrial zones in Hong Kong*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Lai, L. W. C. 1994. *The economics of land-use zoning: A literature review and analysis of the work of Coase*. Town Planning Review 65 (1): 77-99.

_____. 1997. *Property rights justifications for planning and a theory of zoning*. Progress in Planning 48(3): 161-245.

_____. 1997. *Town planning in Hong Kong : A critical review*. Hong Kong: Hong Kong Economic Policy Studies Forum , Hong Kong Centre for Economic Research, City University of Hong Kong Press.

_____. 1998. *Zoning and property rights a Hong Kong case study*. Hong Kong: Hong Kong University Press.

_____. 1999. *Reflections on the Abercrombie Report 1948: A strategic plan for colonial Hong Kong*. Town Planning Review 70(1): 61-87.

_____. 2002. *Planning and property rights in Hong Kong under constitutional capitalism.* International Planning Studies 7(3): 213-225.

_____. 2003. *Town planning in Hong Kong: A review of planning appeal decisions, 1997-2001.* Hong Kong: Hong Kong University Press.

_____. 2005. *Neo-institutional economics and planning theory.* Planning Theory 4(1): 7-19.

Lai, L. W. C. and Chan, P. Y. L. 2004. *The formation of owners' corporations in Hong Kong's private housing estates.* Property Management 22(1): 55-68.

Lai, L. W. C. and Fong, K. 2000. *Town planning practice: Context, procedures and statistics for Hong Kong.* Hong Kong: Hong Kong University Press.

Lai, L. W. C., Ho, D. C. W. and Leung, H. F. 2004. *Change in use of land: a practical guide to development in Hong Kong.* Hong Kong: Hong Kong University Press.

_____. 2005. *Planning conditions in Hong Kong: an empirical study and a discussion of major issues.* Property Management 23(3): 176-193.

Lai, L. W. C. and Ho, W. K. O. 2001a. *Low-rise residential developments in green belts: A Hong Kong empirical study of planning applications.* Planning Practice and Research 16(3-4): 321-335.

_____. 2001b. *A probit analysis of development control: A Hong Kong case study of residential zones.* Urban Studies 38(130): 2425-2437

_____. 2001c. *Small is beautiful: A probit analysis of development control of small houses in Hong Kong.* Environment and Planning B: Planning and Design 28(4): 611-622.

_____. 2001d. *Zone separation: A probit analysis of Hong Kong planning application statistics.* Environment and Planning B: Planning and Design 28(6): 923-32.

_____. 2002a. *An econometric study of the decisions of a town planning authority: Complementary & substitute uses of industrial activities in Hong Kong.* Managerial and Decision Economics 23(3): 127-135.

_____. 2002b. *Using probit models in planning theory: An illustration.* Planning Theory 1 (2): 146.

_____. 2002c. *Planning for open storage of containers in a major international container trade centre: An analysis of Hong Kong development control statistics using probit modelling.* Environment and Planning B: Planning and Design 29 (4): 571-588.

_____. 2003. *Modeling development control of residential development: A probit analysis of rent seeking and policy autonomy in town planning in Hong Kong.* In: F., Columbus. eds. Policy and Economics of Asia, Vol. VII, Cha. 4, 155-176 Huntington, NY: Nova Science Publishers.

Lai, L. W. C. and Hung, C. W. Y. 2008. *The inner logic of the Coase theorem and a Coasian planning research agenda.* Environment and Planning B: Planning and Design 35(2): 207.

Lai, L. W. C. and Lorne. F. T. 2006. *The Coase theorem and planning for sustainable development.* The Town Planning Review 77(1): 41.

Lands and Works Branch. 1989. *Consultative paper on rural planning & improvement strategy.* Hong Kong: Government Printer.

Larkham, P. J. 1990a. *Development control information and planning research.* Local Government Studies 16(2): 1-7.

_____. 1990b. *Use and measurement of development pressure.* Town Planning Review 61(2): 171-83.

Legislative Council Brief. 2003. *Town Planning (Amendment) Bill 2003*. Hong Kong: Government Printer.

Leung, G. K. K. 1993. *How can town planning contribute to the greening of the city*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Li, C. Y. 2006. *Monitoring Development Control in Hong Kong: a probit analysis of planning application for change in use and development in industrial zones.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Li, S. 1996. *Urgency call on rezoning*. South China Morning Post, Hong Kong: November 29, 1996

Liu, H. L. 2003. *Zone separation: A probit analysis of Hong Kong planning application statistics relating to open storage use*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Long, J. S. 1997. *Regression models for categorical and limited dependent variables*: Sage Publications.

Maantay, J. 2001. *Zoning, equity, and public health.* American Public Health Association 91: 1033-1041:

Mandelker, D. R. 1981. *The taking issue in land use regulation.* New York: The Land use policy debate in the United States (Agricultural economics and policies), Plenum Press.

McNamara, P. and Healey, P. 1984. *Limitations of development control data in planning research: A comment on Ian Brotherton's recent study.* Town Planning Review 55: 91-7.

Munneke, H. J. 2005. *Dynamics of the urban zoning structure: An empirical investigation of zoning change.* Journal of Urban Economics 58 (3): 455-473.

Ng, C. Y. H. 2006. *Comprehensive development area (CDA) zoning in Hong Kong: A probit analysis of planning application statistics.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Ng, S. K. 1987. *Agricultural land use and planning in the rural areas of the new territories: A case study in the north west new territories.* Hong Kong: Unpublished MSc (Urban Planning) Dissertation, The University of Hong Kong.

Ngai, T. H. 2002. *An analysis of the statutory planning control mechanism in Hong Kong: A probit study of agricultural zones.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong

Nissim, R. 2007. *Land administration and practice in Hong Kong*. Hong Kong: Hong Kong University Press.

Planning, Environment and Lands Branch, Government Secretariat. 1991. *Comprehensive review of the town planning ordinance: Consultative document*. Hong Kong: Government Printer.

Poulton, M. C. 1997. *Externalities, transaction costs, public choice and the appeal of zoning: A response to Lai Wai Chung and Sorensen*. Town Planning Review 68(1): .81-92.

Preece, R. A. 1990. *Development control studies: Scientific method and policy analysis*. Town Planning Review 61: 59-74.

Rydin, Y. 1993. *The British planning system: An introduction*. London: Palgrave Macmillan.

Sellgren, J. 1990. *Development-control data for planning research: The use of aggregated development-control records*. Environment and Planning B: Planning and Design 17(1): 23-37.

Sir Murray Maclehose. 1981. *Speech by the governor*. Hong Kong: Hong Kong Hansard, Government Printer.

So, F. S. 1979. *The practice of local government planning*. Washington, D.C.: International City Management Association and American Planning Association.

Sorensen, T. 1994. *Further thoughts on coasian approaches to zoning. A response to Lai Wai Chung*. Town Planning Review 65(2): 197-203.

Staley, S. R. 1994. *Planning rules and urban economic performance: The case of Hong Kong*. Hong Kong: Hong Kong Centre for Economic Research, The Chinese University Press.

Stigler, G. J. 1966. *The theory of Price*. 3rd Edition, New York, Macmillan.

_____. 1971. *The theory of economic regulation*. The Bell Journal of Economics and Management Science 2(1): 3-21.

_____. 1987. *The theory of Price*. 4th Edition, New York, Macmillan.

Sustainable Planning and Development. 2003. *Paper presented at International Conference on Sustainable and Planning Development*. Southampton: WIT.

Tang, B. and Tang, R. M. H. 1999. *Development control, planning incentive and urban redevelopment: Evaluation of a two-tier plot ratio system in Hong Kong*. Land Use Policy 16(1): 33-43.

Tang, B. and Choy, L. H. 2000. *Modelling planning control decisions: A logistic regression analysis on office development applications in urban Kowloon, Hong Kong. Cities* 17(3): 219-225.

Tang, B., Choy, L. H. and Wat, J. K. F. 2000. *Certainty and discretion in planning control: A case study of office decentralization*. Urban Studies 37: 2465–2493.

Town Planning Office. 1988. *Town planning in Hong Kong*. Hong Kong: Government Printer.

Unwin, R. 1994. *Town planning in practice: An introduction to the art of designing cities and suburbs*. New York: Princeton Architectural Press.

Wan, C. H. B. 2004. *An analysis of the statutory planning control mechanism in Hong Kong: a probit study of other specific uses annotated business zones*. Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Webster, C. J. 1998. *Public choice, Pigouvian and Coasian planning theory*. Urban Studies 35(1): 53-75.

Willis, K. G. 1995. *Judging development control decisions*. Urban Studies 32(7)

Wong, S. 2002. *Crunch time for rezoning bid wharf awaits outcome of plan to build a three-star hotel targeting mainlanders in Tsuen Wan factory district.* South China Morning Post, Hong Kong: October 23, 2002.

Yu, W. C. 2003. *Modeling town planning statistics for recreation and conservation zones in Hong Kong.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.

Yung, P. 2001. *Decisive criteria in development control decisions: A probit inquiry.* Hong Kong: Unpublished BSc (Surveying) Dissertation, The University of Hong Kong.