Land Policy and Property Price in Hanoi, Vietnam

Hironori KATO
Associate Professor
Graduate School of Engineering
University of Tokyo
7-3-1, Hongo, Bunkyo-ku, Tokyo
113-8656 Japan
Fax: +81-3-5841-7451
E-mail: kato@civil.t.u-tokyo.ac.jp

Le Hong NGUYEN
Infrastructure Planning Department
Hanoi Authority for Urban Planning and Architecture
11C Cat Linh Str. Dong Da district
Hanoi, Vietnam 10000
Fax: +84-4-3732-0915
E-mail: nguyenhongle@gmail.com

Abstract: This paper reviews the past and current land policies in Hanoi, Vietnam and analyzes the local property prices to find the main factors affecting the local land market. The institutional systems regarding land market have been changed dramatically for several decades in Vietnam. It causes various problems including instable property prices. The current property price evaluation in Hanoi reflects the real demand of the market while trying to meet the requirements of Land Law. However, it still suffers from the lack of data and knowledge on land market. Then, the property price is analyzed to understand the property price structure with the hedonic price method. The property price functions are estimated in five zones in Hanoi. The results show that various factors such as the location from the nearest street, number of floors and road ratio impact significantly the property prices.

Key Words: land policy, property price, Hanoi, hedonic price analysis

1. INTRODUCTION

The importance of integrating transportation planning with land-use planning has been highlighted for many years (Transportation Research Board, 1999). For transportation planners, land policy is one of the most essential issues to plan any urban transportation system in urbanization process. Nevertheless, understanding the land market structure and developing good land policy system remain a key challenge for many countries (UN-ESCAP, 1997). Vietnam, especially Hanoi city – its capital - presents a typical case of how no well-designed land market in a poorly-managed urban development process has manipulated the local property price. Vietnam shifted to market-oriented economy in late 1980s. With the transition from a centrally planned system to a market economy and a constant high GDP growth over the last two decades, Vietnamese increasingly demand better quality in houses and business facilities. These pushed the property market and provided developers with incentives to build more properties. However, before the approval of the Land Law 2003 in November 2004, legally and theoretically, the land had no market value given the principle of "people own land while the State manages land". Instead, the state had enacted statutory pricing formula for calculating the land values. Then, the price differences between state values and market values became bigger gradually. This biased the evaluation of local properties and generated the illegal transaction/conversion of land use in Hanoi. These are serious problems in land market of Hanoi even now. To avoid the further land problems in the future, it is critical to understand the property price structure in a systematic way.

Then, this paper aims to analyze the property price in Hanoi to find the main factors affecting the local property market. The paper is organized as follows. Next chapter reviews the past and current land market in Hanoi based on policies, legal system and other information related to the property market. Chapter 3 describes the current problems regarding property

price in Hanoi. Chapter 4 analyzes the characteristics of property price with the statistical data and estimates the property price functions by using the hedonic price analysis. Finally Chapter 5 summarizes the paper and shows the further research topics.

Note that this paper uses the general information and data of Hanoi before 2008. On August 1st 2008, the Vietnam Assembly approved to expand Hanoi to include other surround areas: province Hà Tây, Mê Linh district (Vĩnh Phúc) and 4 districts of Lương Sơn (Hòa Bình).

2. LAND MARKET AND ITS POLICIES IN HANOI

2.1. Rapid Urbanization

Hanoi is the capital and the second largest city of Vietnam. Its area is 920.97 km^2, covering 2.8% of the total area of Vietnam. The population of Hanoi was 2,397,600 in 1996, which rose to 3,055,300 in 2003. It accounts 3.9% of the country's total population. The population growth rate in the inner city of Hanoi has increased significantly in recent years as the result of the growing annual influx of immigrants from rural areas. The Comprehensive Urban Development Programme in Hanoi City (JICA, 2005) forecasts that Hanoi's population will reach 4.5 million by 2020. The inner city has 52.9% of the total population in Hanoi while it covers only 9.15% of the total municipal area (Hanoi Statistical Office, 2005). This makes the inner city of Hanoi to be the most densely population area in Vietnam with 3,415 persons per km^2. Hanoi has enjoyed rapid economic growth after the economic reform, known as "Doi moi" in 1986 (Boothroyd and Pham, 2000). The average annual economic growth rate has been 12% since 1991. The GDP per capita has increased in the period 1995 - 2003 from 6.2 million VND to 15.9 million VND (Hanoi Statistical Office, 2005). In line with the overall development trend for the country, Hanoi has experienced rapid urbanization. Historically, most of the urban areas have been built in the Southern part of the Red river. Development has been taken place mainly in the fringe of built up areas along major roads. Urban areas have expanded beyond Ring Road 2, then further to Ring Road 3. The rapid urbanization and more influx of population unavoidably caused the shortage of accommodation in the city. The City government has set an objective to construct 3 - 3.5 million m^2 of residential floor-areas during 2001-2005 to allow an average area of 7 - 7.5 m^2 for each person (Hanoi People's Committee, 2000). The latest report indicates that about 5 million m^2 of floor areas have been built so far (Hanoi Authority for Urban Planning and Architecture, 2006). Although about 1 million m^2 floor-areas are additionally supplied each year, housing is still a hot issue in Hanoi, impacting significantly the local land market.

2.2 Institutional System on Land Market

Past institutional system on property market in Vietnam is well reviewed by Nguyen and Hans (2002) and General Department for Land Administration (2000). This sub-section summarizes the characteristics of the land use rights, land transfer and land market in Vietnam on the basis of these literatures.

2.2.1 Land use rights

The private ownership of land used to be officially recognized in Vietnam before the August 1945 Revolution (Nguyen and Hans, 2002). Then, during the socialization of private production and trade in 1958–1960, the private properties and land were gradually converted into state ownership. During the 1960–1971 period, the most lands that had been privately owned by farmers were progressively integrated into the collective ownership and they were allocated to agricultural cooperatives and state enterprises. Note that the 1960 Constitution of the Democratic Republic of Vietnam allowed the private ownership in addition to state and

cooperative ownership. This means that the land was in practice either nationalised or converted into cooperatives following Land Reform Law 1953 although the 1960 Constitution theoretically allowed the private ownership. After the reunification in 1975, the 1980 Constitution stipulated that the state has the land ownership for the whole country and no private right to own the land is allowed. Land was allocated through the central administrative control rather than the market mechanism. However, in 1988, the State enacted the Land Law permitting the grant of land-use right both to organizations and individuals (General Department for Land Administration, 2000). The principle of no private right of owning land was changed into "people's ownership" and "state management" in the 1992 Constitution and 1993 Land Law. Furthermore, as a concession to the emerging mixed market economy, the Land Law 1993 allowed various private rights regarding land, which include the land transfer and leasing without disturbing the underlying principle of state ownership of land. These rights were extended and clarified by the 1998 and 2003 Land Laws.

2.2.2 Land transfers

Formally, private access to urban residential land in land market is primarily gained not by buying and selling but by land transfers (Nguyen and Hans, 2002). This is because land is "owned by the people" in legislation. 1988 Land Law prohibited any kind of land transaction, encroachment or land lease among private individuals. The land users, in most cases the state organizations, were not required to pay for the land allocated to them except for the small formal amounts of land-use fees. All premises were developed by the state-owned companies under the direction of the authorities, thus no property market officially existed. However, although the Civil Code (article 694) required the transfer of land-use right to be based on the price formula set by the Ministry of Finance, in practice, both officially registered and unregistered land were routinely bought and sold according to the market prices (General Department for Land Administration, 2000). Then, 1992 Constitution was introduced recognizing that the land-use right can be transferred among households and individuals although it restated that all land is owned by the State as representative of the people. Based on the new principles, a new version of the Land Law was promulgated in 1993 making a significant advance toward the formulation of a legal framework for land administration. The new Land Law established a legal basis for land allocation and lease, which secures the land-use right of landholders including the rights of long-term land use, land transfer, inheritance, lease, mortgage, and compensation for expropriation. It should be noted that historically, about 70% of all land transactions took place without a paper trail (Phe, 2002). This means that the authorities were unable to tax or manage the sector effectively. Thus, the new law also aimed to change it by standardizing land transactions.

2.2.3 Land market

Before the approval of the Land Law 2003

Throughout the socialist period, buying and selling of urban residential land/housing continued through personal networks in the black market under the tacit approval of local authorities (General Department for Land Administration, 2000). The indiscreet land trade resulted in the voluntary surrender of surplus land. Even after the "nationalisation" of private land in 1980, the informal urban housing market continued. The state tacitly accepted the commoditisation of urban residential, but not commercial land. The state valuated the land-use right with the price formula. The price formulas set by the Ministry of Finance are used to determine the fees charged for land allotments, leases and transfers and compensation paid for compulsory acquisition and taxation. In this formula, the values of land-use right are determined based on city classification grouping cities into five classes. The classification is

determined considering the potential for business profitability, infrastructure and location i.e. proximity to city centers and major roads, etc. It may be considered that the price formula attempted to "scientifically" replicate market price indicators. However, there was a big gap between the property price indicated by the government and the market price.

After the approval of the Land Law 2003
The key features of the new Land Law 2003 are summarized as: the formal recognition of real estate markets with a relaxation of Government's control of the land supply and cost; the devolution of responsibility from the central government to local governments in terms of land administration and registration; the use of market values for evaluating the compensation, taxes, and land-use fees; the public participation in planning; and the public notification of approved plans. The Land Law motivated the property developers, the majority of which are still state owned, to build the planned developments. 2003 Land Law gave the significant changes in property price not only in Hanoi but also in the whole country. According to this Law and Decree 188/2004/ND-CP dated 16 November 2006, the property value was formally recognized by the laws. In principle, the price of land-use right is formulated based on (i) the official property price list established and approved annually by local government, which must be equal to the property price in the market in normal conditions; (ii) the bidding or the winner's auction price for land-use right of individual or organizations; and (iii) the agreement among stakeholders about transaction, leasing, or joining capital by land-use right. All local governments including cities and provinces are required to publish the reports regarding their local property price list every year on January 1st. Besides, the approval of the Real Estate Business Law in July 2006 has created a good condition to foreigners and overseas Vietnamese to enter the real-estate market, allowing them to provide a wide range of services relating to real estate, including brokerage, pricing, buying and selling, consultancy, auctions, advertisements and management. This is one of the State efforts to give a favourable condition to non-resident Vietnamese and foreign property investors to provide clear legislative framework for the land market to ensure transparency.

3. CURRENT PROBLEMS ON PROPERTY PRICE IN HANOI

3.1 Property-Price Problems after Land Law 2003
With the Land Law 2003, the land market in Vietnam was changed substantially from the government control to market-based system. This transition process is a big challenge for the governments without the rich knowledge and experience to manage it. A number of issues regarding the property price arose in Hanoi. They include:
Too high property price: The property price in Hanoi becomes sky-high and arguably leads to major distortions in the broad economy. Local property experts estimate that only 5% of the population can buy the properties at current inflated prices, which are far beyond the affordable level of average national incomes.
Large fluctuation of price in the real estate market: As there is a lack of knowledge and practical experiences of property investors, brokers and appraisers to properly evaluate the actual price, the property price in Hanoi is totally subjected to the psychological aspects of buying- selling speculation and ignoring the real supply-demand aspect of the market. This consequently causes the "fever" and "frozen" of unstable price.
Lack of proper property price evaluating methods: The Decree 188/2004/ND-CP prescribes methods of determining property prices, and valuating specific land categories based on local condition. It also indicates the property price boundaries which give the maximum and minimum property prices in all cities or provinces. However, there is a big gap between the

actual price and the price set by the State. This has led to the contradiction within the Land Law and simultaneously causes the difficulties in transaction, lease, taxes and evaluation of the property.

The problems mentioned above have strongly affected the land market in Hanoi. They are arguably leading to major distortions in the broader economy since the real-estate sector plays more important role in economic growth. Moreover, due to the uncontrolled property price, the city government is not able to make the appropriate policies to manage and make a real land market and ensure transparency.

3.2 Current Evaluation Methods of Property Price in Hanoi
3.2.1 Property price evaluation methods used in Hanoi
First, Ministry of Finance and its Financial Authorities are in charge of providing the methods to annually determine the property price. This follows the Decree 188/NĐ-CP and evaluate currently by two major methods: the first is the direct comparison of property prices among places when there is the past experience of land-use transfers at the place in the same land category with similarity to the to-be-priced place.; and the second is the income-based method by which the prices of land categories are determined based on the revenue gained from the land.

Next, Hanoi Authority for Finance evaluates property price in Hanoi in practice. They use the following methods: first, they carry out surveys on the property price by collecting land transfer information in the property market of representative streets; second, they determine the market property price per square meter of representative parcel of the street and location with the collected data; third, they use the comparison method to evaluate the property price of the remaining areas; finally, they re-examine the evaluation results by incorporating socio-economic conditions, income and expenditure/expenses, financial obligations of organizations and individuals, etc. before releasing the property price annually.

3.2.2 Problems in Property Price Evaluation Method
From the practical viewpoints, the current property price evaluation in Hanoi reflects the real demand of the market while trying to meet the requirements of Land Law. There are the following three problems in this method. First, the issued price does not reflect the real price well. The issued property price by the City government is only 30-70% of the actual market price. Second, the accuracy of property price evaluation is low due to the lack of information. Although the property price is surveyed in a considerable scale in Hanoi, the coverage of data is quite limited. For example, the survey covers only the transfer of residential land-use. Third, the property price has not been well analyzed with the collected data. The main factors directly or indirectly affecting the property price and property price structure have not yet been identified. For example, there has been insufficient analysis on social-economic and infrastructure conditions, living standards, social services, people's willingness, the parcel special characteristics (legacy, figure of the parcel), the land owner characters, (psychology and others) as well as the changes in the land market.

4. PROPERTY PRICE ANALYSIS

4.1 Definitions of Zones in Hanoi
According to its historical development and urbanization process, Hanoi can be divided into the following five main zones: Ancient quarter, French quarter, Area built during the 1960–1990 (urban core), New built area after 1990 (urban fringe) and Outer dyke area. These zones

are depicted in Figure 1. The property price is analyzed based on these five zones.

Ancient quarter

The Ancient quarter is located at the city center of Hanoi. It is a popular urban center attracting many tourists with the concept of old quarter of Hanoi. This area has been organized since the 15th century and was composed of 36 guilds. Each guild was a residential area where people lived, carried out manufacturing activities and made business. The Ancient quarter has become the busiest traditional commercial and residential district with the highest density of enterprises and population in Hanoi. The Ancient quarter maintains until now its function as a big trading center together with its original historic values. At present, there are about 80,000 populations in a total area of about 100 ha in this quarter. The population density is 623 persons per ha. The average household income in the Ancient quarter is 3,577,000 VND/month, which is 1.4 times higher than the average of Hanoi (JICA, 2005). The land-use pattern in the Ancient quarter is highly mixed. The most area is used as either for residential, commercial, or both. Many households run their businesses at home. The typical buildings in this area are located at a longitudinal land plot with the façade next to the street. The front part of the building is used for business activities whereas the rear part is used for residential purposes. Road network in this zone has been developed spontaneously without any schematic planning. In the long history, the streets were formed mainly for trading purposes. As often found in very old cities, the street density in the Ancient quarter is very high, with road area ratio of 23.5% (JICA, 2005). The streets are mostly narrow with the width of the carriageway varying from 6m to 9m. The sidewalks are normally narrow,
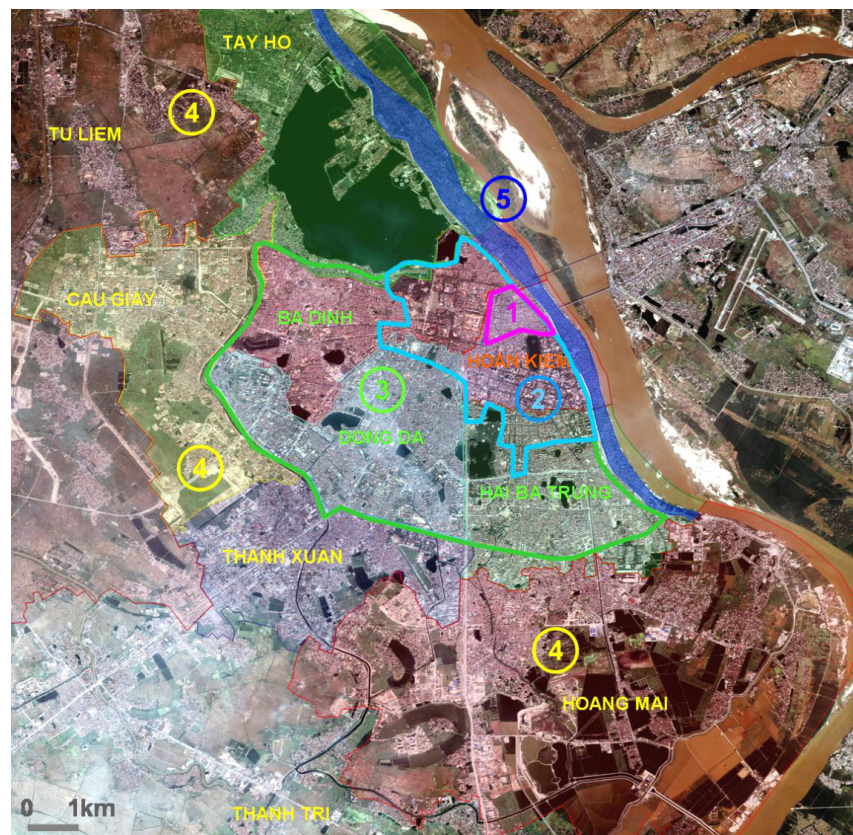

Figure 1 Zoning system used in the property-price analysis

Notes: 1. Ancient Quarter; 2. French quarter; 3. Area built during 1960-1990; 4. Area built after 1990; and 5. Outer dyke area.

Source of original map: LANDSAT-17 Nov. 2001, MOT and JICA Study Team

between 2 m and 4 m wide. The current infrastructure system in Ancient quarter is insufficient and poor. Such condition results in negative impacts such as urban environment pollution, poor living conditions and public health deterioration. Because of rapid economic development and an increased demand of urban services in the residential and commercial areas, the capacities of old and insufficient infrastructure have reached their limits.

French quarter

The French quarter was built during the French colonization period since 1873. This zone is located surrounding the Ancient quarter and has an area of around 718 ha. It includes the southern part of Hoan Kiem district, the northern part of Hai Ba Trung district and the eastern part of Ba Dinh district with the population of around 200,000 inhabitants (JICA, 2005). The French quarter is well-known as a political and administrative center of Hanoi city, where most of the central governmental and diplomatic offices are located. The French colonization had strongly inherited a Western architecture design of urban planning in this zone with a grid network of wide avenues. The average road area ratio is about 16.5% (JICA 2005). The infrastructure system was built in a well-organized way together with houses and street network development. At present, most of the road network and infrastructure are still kept in their original designs and good conditions as they were built. In term of land use, this zone can be divided in the following two sub-areas: the official area; and the residential and business area. The official area is located mainly around the southern part of Hoan Kiem lake and on the north-western part of the Ancient quarter. The residential and business area is located at the northern and southern parts of this zone. Most of the houses in this area consist of the villas and the wider detached houses, which were mainly built by the French with the Western style. As the time and political changes, the housing style of this zone has also changed from their original designs. After the withdrawal of French from Hanoi, the old French houses were allocated for different purposes. Some houses are used for the government office whereas other houses are divided into several small parts for many households. This zone has the largest share of parks and open space among the five zones in Hanoi. Consequently, the environment and living conditions are quite favorable. It is one of the "dreams" for Hanoians to live here.

Area built during 1960-1990

This zone is built during the 30 years of the centrally-planned economy from the 1960s to 1990s. Its area is around 2,641 ha including the western part of Ba Dinh district, the entire of Dong Da district and southern part of Hai Ba Trung district. There are 774,000 inhabitants (JICA, 2005). This area has been built mainly by replicating the model of production and social organization, following the former Soviet planning principle. About 45 percent of this zone is used for the urban core's institutional area with government, educational, health and security related institutions, which are mainly located in Dong Da and Ba Dinh district. Large industrial area can be also found around the south of Hai Ba Trung district. The residential area in this zone can be divided into two types. The first type includes the five-story residential buildings, which were developed about 20 years ago. These residential neighbourhoods were designed with the fixed formula of 7,000 to 12,000 inhabitants in an area of 15 to 25 ha. They include the social service facilities such as kindergartens and schools. The second type consists of the villages, which were integrated into the inner city such as Kim Lien, Bach Mai, Van Chuong, Giang Vo, Vinh Ho, Khuong Thuong and Trung Tu villages. The houses in these villages were mostly built independently with various styles and qualities. Most of these houses have the surrounding gardens. The road network is often inadequate mainly due to the historical development of these villages. The road area ratio is only 3.5% in the majority of communities (JICA, 2005). There are many hot spots with

serious traffic problems, mainly due to the heavy traffic congestion. The infrastructure system such as water supply, sewerage and drained systems are also in shortage. The living environment is undesirable in this zone as many lakes or river are polluted.

Area built after 1990
This zone is located outside the ring road No.2 with 12,966 ha area. It has been developing under the market-oriented development during the dramatic urbanization of Hanoi since 1990s. It includes the four urban fringe districts, namely Tay Ho, Cau Giay, Thanh Xuan and Hoang Mai, and the urban land area of two suburb districts: Tu Liem and Thanh Tri. There are around 784,000 people living in this zone (JICA, 2005). Although the current population density in this area is still low, it has been growing at 6.5% of the average annual population growth rate over five past years. Note that the average annual population growth rate is 2.7% in Hanoi city. One of the reasons for the rapid increase of population is the high rate of urban development of Hanoi city in this area. Most of these urban development projects are of medium size, averaging from 80-100 ha; exceptionally the Ciputra Urban Area has reached to 300 ha. The house development projects and new urban area projects have been carefully planned and implemented simultaneously. They strictly followed the master plan with modern housing network comprising low buildings that are comforted and spacious with modern architecture. The infrastructure system like transportation network, electric power and gas supply has been built with high technical standard. The public services like schools, hospitals and open green spaces have also been synchronously designed and built, consequently creating a really modern living environment for the Hanoian. This area partly has set a landmark in urban planning of Hanoi and attracts people to move into. Together with house and office development plans, the new built planning transportation network has also been rapidly implemented. Many asphalt-covered major road with the width from 40 to 100 m has been constructed in this area. Although the road area ratio is just 6.5% now, it is expected to reach 20% within the next 10 – 15 year period if the implementation is progressed as planned.

Outer dyke area
This zone is located in the outer dyke along the Red river. According to the Ordinance on dyke management, any kind of construction is illegal in this zone. Nevertheless, people have been living in this area since 1950s. At present, the outer dyke area is one of the highest populated areas with 17,000 people living in an area of only 1.018 ha (JICA, 2005). Many houses in this area are 1-3 story houses built on temporary basis. During the flood season, most of the roads and houses are inundated under 1.5-3m high flood water. Although the Da river Hydropower plant was constructed to regulate the flood level, these houses are not only damaged by floods every year but also cause problems in flood flow increasing the river flood level, and this results in increasing flood risk in Hanoi City. The road network in this zone is not complete and mainly comprises of scattered crosscut roads. The road area ratio in this zone varies from 3.8 to 6.5% (JICA 2005). The infrastructure system is insufficient and often requires special maintenance or upgrading. Urban residential and mixed uses are the dominant land use type. The population is also mixed with employees of government offices, enterprises, traders, and self employed workers as well as those living on agricultural activities.

4.2 Property Price Analysis

4.2.1 Data used

We use the property price data of the year 2006 collected by Hanoi Authority for Finance (HAF) for the property price analysis. HAF survey collected the data regarding the property transaction in 394 streets of 10 districts of Hanoi. HAF interviewed the real estate transaction owners with the survey sheet. The survey sheet requests the interviewees to answer the their address; location; distance to the nearest street; house information including type and quality; area and figure of the parcel; infrastructure conditions; legal factors; transacted price and transaction time. Total number of samples examined in our analysis is 1,543, which are selected from among 5,948 samples. The reasons for selecting the data from the original data are first because some of the properties in the original dataset are located outside of our research zones, and second because we selected only valid data for our analysis including all necessary information such as the address of the property. The price distribution of sample data with the zone-based share is shown in Figure 2. Figure 2 shows that the property price in Hanoi varies in a wide range, from less than 30 million VND per square meter up to more than 250 million VND per square meter and mainly focused in the range less than 50 million per square meter. It is also shown that the property prices in two areas: outer dyke area and new area built after 1990 vary in a very narrow range from less than 30 million to 30-50 million VND, whereas in other areas the prices greatly vary. The price in Area built 1960 - 1990 varies from less than 30 million to 90-110 million VND. In French quarter area, the prices are slightly higher than the average price and vary in a wider range from less than 30 million to 150-200 million VND. In contrast to other areas, the property prices in Ancient area are rather higher, varying in slightly narrower range compared to that of French quarter, from 70-90 million to more than 250 million VND. These show that the property prices decrease as the distance from the city center increases. Note that the property price in Hanoi is higher than the average income level of the city (Sieu, 2006). The average household income of
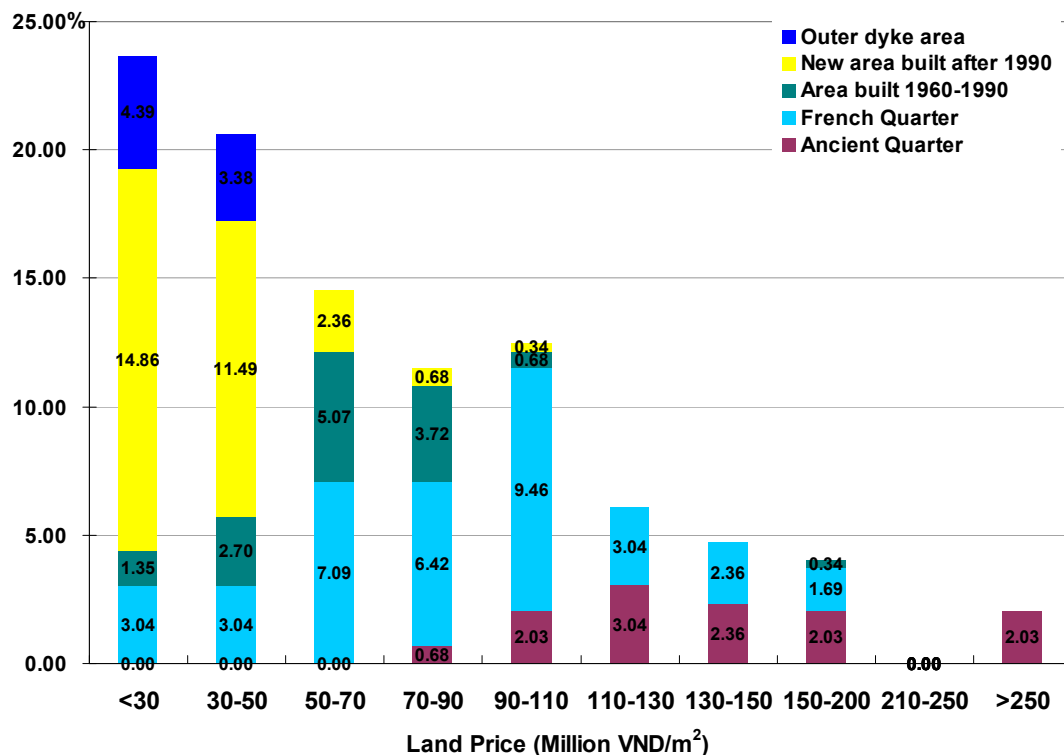

Figure 2 Property price distributions of sample data

Hanoi City is 2.5 million VND per month (Hanoi Statistical Office, 2005),.

4.2.2 Impact of Accessibility to Adjacent Street on Property Price
Accessibility to transportation network is one of factors that generally have big impacts on the property price. In the case of Hanoi, due to the poor public transportation provided and the lack of road network ratio in almost the whole city, we expect that the accessibility from the house to the street is one of the most important factors. According to the definitions made by the City government, there are the four types of locations shown in Figure 3. Location 1 is the house along the street, usually a mixed-use house for commercial or both commercial and residential purposes, whereas the other locations 2, 3, and 4 are mainly for residential use.

The relationship between property price of location1 and property prices of location 2, 3, and 4 in Ancient Quarter is shown in Figure 4. First, the property price of location 1 always has higher price than any other locations in the same street. This is because location 1 can be used for business activities like a shop or rental office at which the people can earn. Second, the prices of house decrease as the accessibility to the street decreases from location 1 to other locations; the cheapest price usually is observed at the house in location 4. Price of houses
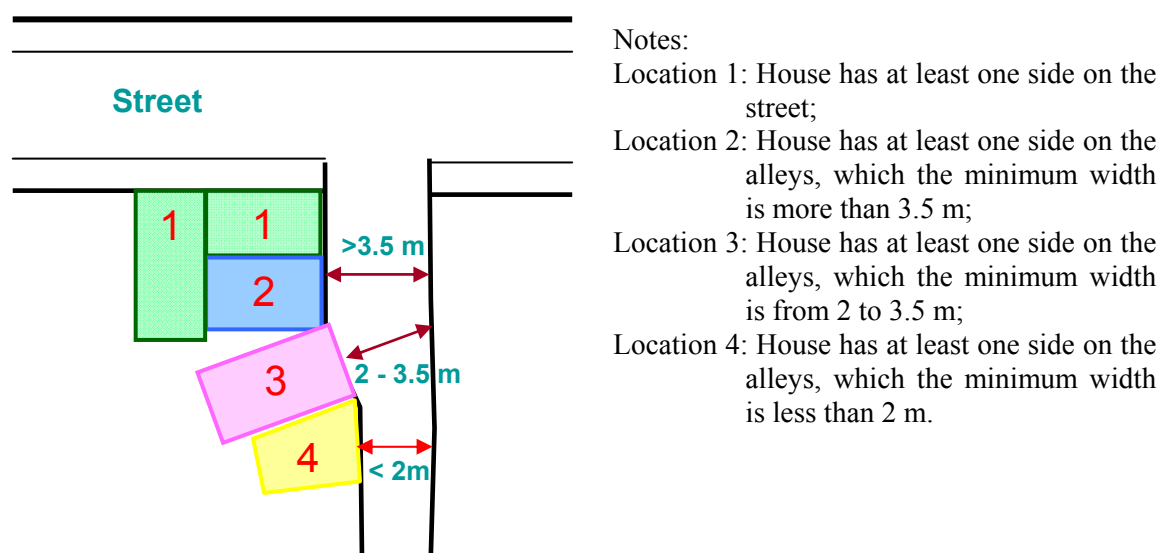

Notes:
Location 1: House has at least one side on the street;
Location 2: House has at least one side on the alleys, which the minimum width is more than 3.5 m;
Location 3: House has at least one side on the alleys, which the minimum width is from 2 to 3.5 m;
Location 4: House has at least one side on the alleys, which the minimum width is less than 2 m.
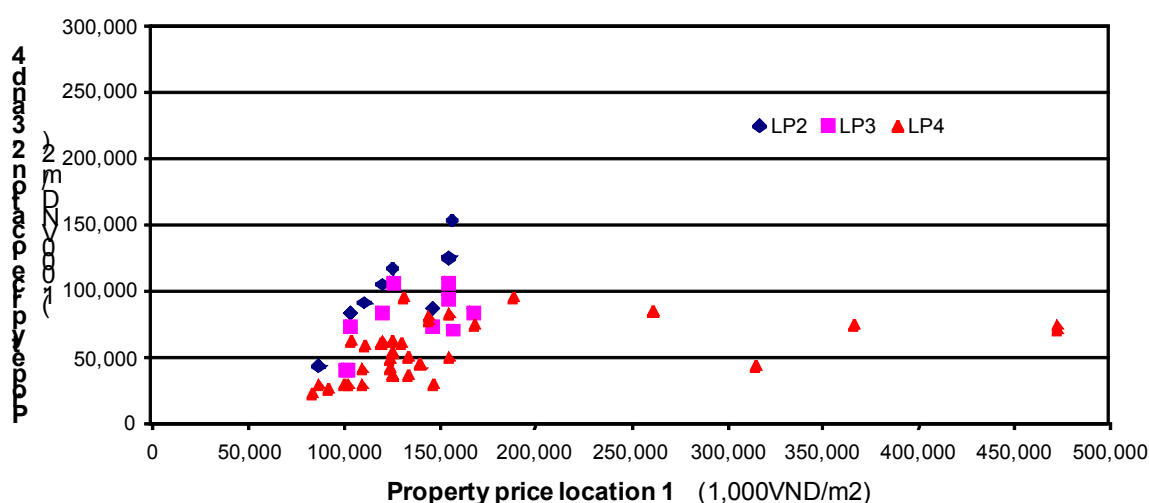
Figure 3 Definitions of property locations

Figure 4 Property price of location 1 versus property prices of locations 2, 3 and 4 in Ancient quarter

located in location 2, which mostly used for residential purpose but easily access to street, has strongly correlation with houses in location 1. While the houses in location 3 and 4 have fewer correlations with price of the first location. Third, in some special streets with the highest property price of Hanoi, although price of location 1 is extremely high but there is a big gap between the price of location 1 and the house in the back side.

4.2.3 Estimation of Property-Price Functions

The hedonic price method is used for estimating the property-price functions. The hedonic price method hypothesizes the property price as a function of a bundle of attributes, which can be thought of as made up of two parts: internal factors and external factors (Rosen, 1974; Kanemoto, 1988). The internal factors consist of house physical characteristics, such as house area and the number of floors whereas the external factors embrace the factors of the transportation accessibility and environment of the neighbourhood.

The variables used in the estimation in our study are defined in Table 1. *Location* is defined by following the Government's definition shown in Figure 3 as: Location 1 = 1; Location 2 = 2; Location 3 = 3; Location 4 = 4. *Distance* is defined as 0 if the house located along the street; 1 if the distance from property to the nearest street is less than 50 m; 2 if the distance from property to nearest street is from 50 to 100 m; 3 if the distance from property to nearest street is from 100 to 150 m; and 4 if the distance from property to nearest street is more than 150 m. *Direction* is defined as 1 if the property faces the southeast direction; and 0 if not. This variable is introduced because Vietnamese prefer the house which faces to the South, East, and Southeast directions rather than other direction. It may reflect the climate in Vietnam which is characterized by a strong monsoon influence, and divided into distinguished seasons:

Table 1 Definitions of variables used in the estimation of property price functions

Variables	Definitions	Data sources
Housing characteristics		
Location	Housing location to the street	HAF 2005
Distance	Distance from house to the nearest street	HAF 2005
Shape	Shape of the house (length/width)	HAF 2005 + Calculated
Lot	Area of the house (m^2)	HAF 2005
Floor	Number of floors	HAF 2005 + Calculated
Direction	Direction of the house	HAF 2005
Year	Built year of the house (year)	HAF 2005
Type	Structure of the house	HAF 2005
Legal	Housing ownership	HAF 2005
Price	Property price (Million VND/m^2)	HAF 2005
Neighborhood characteristics		
RoadRatio	Road area ratio (%)	HAIDEP
WaterSup	Water supply – People' assessment index	HAIDEP
Safety	Safety/ Security – People' assessment index	HAIDEP
AirQua	Air quality – People' assessment index	HAIDEP
Flood	Flood vulnerability– People 'assessment index	HAIDEP
Accessibilities		
CBD	Distance to the city center (m)	Calculated
Lake	Distance to the nearest lake (m)	Calculated
Work	To work travel time (min)	HAIDEP
Hospital	Access to Health Care – People' assessment index	HAIDEP
Park	Access to Park and Green space – People' assessment index	HAIDEP
School	Access to school – People' assessment index	HAIDEP
Transit	Access to Public Transport – People' assessment index	HAIDEP

Notes: HAF 2005 means Hanoi Authority of Finance (2005) and HAIDEP means JICA (2005).

cold and hot. *Legal* is defined as 1 if the house owns the land-use right certificate; and 0 else.

Then, the estimated results are shown in Table 2. The relationship between the estimated price and observed price are also shown in Figure 5. First, the estimated results in Ancient quarter shows that the variables influencing significantly the property prices are *Location*, *Age*, *Work*, *Transit*, *Roadratio* and *WaterSup*. The reason for *Floor* is absent in the Ancient quarter is understandable since most of houses in this zone are shared-used houses. Households living there usually own only one or two rooms inside the house for residence; they have to share the common spaces as staircase, lobby, and toilet. Thus, the property price in Ancient quarter mainly does not depend on *Floor*. The absent of *Distance* in Ancient quarter is also reasonable. In Ancient quarter, the most of houses mainly are tube-house and there are not long alleys, so that distance from the house to the street usually around 50 m. As a result, this factor does not have many impacts on property price. Second, the results in French quarter shows that the significant factors are *CBD*, *Distance*, *Floor*, *Legal*, *Location*, *Lot*, *Park*, *Roadratio*, *Shape* and *Work*. The high fitness of the estimated function may mean that the properties in French quarter are traded in more reasonable or transparent way than other area. Third, the results in Area built during 1960-1990 shows that *Built*, *Distance*, *Floor*, *Location*, *Safety*, *WaterSup* are the significant factors. Figure 5 shows that the properties with over 120 million VND/m^2 are underestimated although the most data are scattered around the correlation line. By checking the data sources, we found that the most of properties with high property prices are located mainly at the three streets named Kim Ma, Dang Van Ngu and Vo Thi Sau. These streets are located at the busiest areas in the zone and have extremely high prices compared to others. One of the hypothetical reasons for the underestimated prices of those properties is because they are traded in the different manners from other properties. Then, we re-estimated the price function after eliminating these samples. However, the correlation coefficient was not much improved ($R^2 = 0.47$). The further examination is

Table 2 Estimation results of hedonic property price functions

Variables	Ancient quarter		French quarter		Area built during 1960-1990		Area built after 1990		Outer dyke area	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
CBD			-0.01	-7.66						
Built	0.29	3.28			0.30	2.37				
Distance			-5.65	-4.00	-3.01	-2.80			-6.01	-7.31
Flood									12.45	2.30
Floor			4.14	4.58	3.29	2.75	2.82	3.00	29.61	18.63
Legal			10.93	5.48						
Location	-25.22	-16.02	-16.95	-18.16	-12.41	-8.77	-12.52	-15.21		
Lot			0.12	8.02						
Park			13.56	2.91						
RoadRatio	6.37	5.89	3.14	14.52			1.41	5.77		
Safety					18.99	2.75				
School									18.77	2.15
Shape			-2.41	-4.18			-0.50	-1.94		
Transit	40.34	2.96								
WaterSup	46.41	2.16			9.29	3.68	5.14	3.20		
Work	-5.81	-9.85	-4.15	-7.65			-0.96	-2.83		
Constant	-478.98	-2.72	140.51	10.35	-534.06	-2.12	69.15	8.16	-10.81	-1.52
R-squared	0.71		0.80		0.41		0.59		0.88	
Number of data	202		449		518		256		118	

required to identify the reasons. Fourth, the significant factors in Area built after 1990 are *Floor, Location, Roadratio, Shape, WaterSup* and *Work*. It should be noted that the road network has been properly designed in this zone and therefore, apart from *Location*, the road network plays the most significant roles for people choosing the house to live. Besides, this zone is called the new urban development area that has recently been built. It is expected that people living in this zone thinks more of lot size of the house rather than the accessibility to CBD. Finally, the estimation results in Outer dyke area shows that *Flood, Floor, Legal* and *School* significantly influences the property prices. It is reasonable that *Floor* becomes very
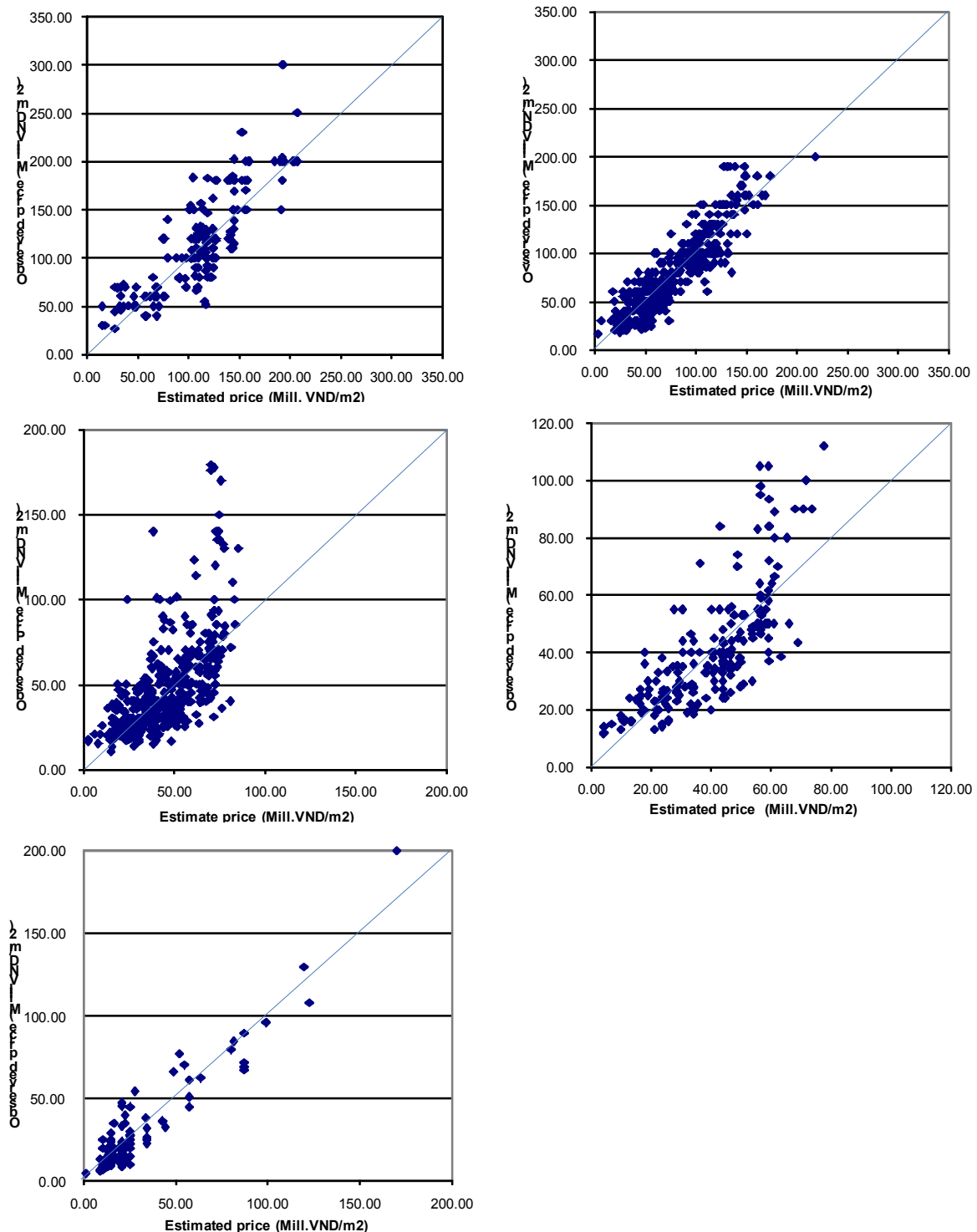

Figure 5 Estimated property prices versus observed property prices

high significant in Outer dyke area since this zone is usually inundated under the water about 2-3 m during flood season. Additionally, as there are many low-income residents in this zone, the accessibility to school is also critical for them. The reason for the high correction rate probably reflects the fact that the property price in this area is clearly dependent on the living conditions including the explanative variables used in our analysis.

4.2.4 Discussions
First, *Location* and *Floor* are included in the estimated price functions of four zones out of five. Especially, *Location* has high *t*-statistics in the four zones. This reflects the high concerns of local people with house location as we expected earlier. Second, in terms of neighbourhood characteristics, *Roadratio* and *WaterSup* are significant in the estimated functions. This is probably because local people consider these two factors more seriously than others since Hanoi has inadequate road network and water supply systems. Third, *Safety*, *AirQuality* and *Food*, which are related to environment conditions, have no impact on property price in all zones. It is unexpected that *Direction* has no impacts on the property price in our proposed functions. It is also unexpected that *Legal* is significant only in French quarter. These may mean less concern of local people with these factors when buying the properties. Fourth, the accessibility factors such as *CBD*, *Park*, *School*, and *Transit* appear only once in price function while *Hospital* does not appear at all. This means that the local people do not care the accessibility to the nearest service from their homes. Actually, for example, local people usually do not go to the nearest medical care facilities but choose a better service even if the service is provided at further places. Finally, the distance to CBD does not influence the property price in the estimated price functions although Figure 2 shows that the longer the distance from city center is, the lower the property price would be. Note that this does not hold true in Outer Dyke zone due to its own characteristics. Why does this difference occur? One of the reasons is because the variation of distances in a zone is too small. The distances to CBD within the zone vary in a narrow range from 2 to 7 km. This may be too small for local residents to find the difference in distance to CBD. Other reason is because the property price in Hanoi is not directly affected by the distance to CBD but it might be influenced by psychological factors. They may include the historical status and the life style in Ancient quarter.

5. CONCLUSIONS

This paper reviews the past and current land policies in Hanoi, Vietnam and analyzes the local property prices to find the main factors affecting the local land market. The institutions regarding land market have been changing dramatically for several decades in Vietnam and it causes various problems including instable property prices. The current property price evaluation in Hanoi reflects the real demand of the market while trying to meet the requirements of Land Law. However, it still suffers from the lack of data and knowledge on land market. Then, the property price is analyzed to understand the property price structure with the hedonic price method. The property price functions are estimated in five zones in Hanoi. The results show that various factors such as the location from the nearest street, number of floors and road ratio impact significantly the property prices. The results from property price analysis indicate that, in principle, the preliminary formed property market in Hanoi has been established to some extent. In all zones, the major factors controlling the property price are well defined. The correlation coefficient of property price functions derived from multiple regression analyses on hedonic price models in these zone are at the acceptable level. However, the fitness of the estimated price functions in Area built during 1960-1990 is not good. We should examine the factors affecting the property price in this area more in

details.

Finally, it should be noted that the property price in Ancient quarter is extremely high although this zone has poor living conditions. Ancient quarter has also a very strict building regulation due to the historical preservation policy of Hanoi administration. To explain the exceptionally high property price in Ancient quarter, it may be necessary to account for other factors that affect the local people's decision-making regarding the residential choice. They may include the social and business aspects, residence component, living style, etc (Phe and Nishimura, 1990). This is also one of the remaining topics that should be tackled with.

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