

## Land Policy and Property Price in Hanoi, Vietnam

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**Abstract:** We reviewed the past and current land policies in Hanoi, Vietnam, and analyzed the local property prices in order to identify the main factors affecting the local land market. The institutional systems associated with the land market in Vietnam have been changing dramatically for several decades; this has created various problems, including instable property prices. The current property price evaluation in Hanoi reflects the actual demand in the market and attempts to meet the requirements of the Land Law. However, it still suffers from the lack of data and knowledge pertaining to the land market. Property prices were analyzed by using hedonic price analysis in order to understand the property price structure. Property price functions were estimated for five zones in Hanoi. The results show that various factors such as location with respect to the nearest street, number of floors, and road ratio affect the property prices significantly.

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

### 1. INTRODUCTION

The importance of integrating transportation planning with land use planning has been emphasized for many years (Transportation Research Board, 1999). For transportation planners, land use policy is one of the most important factors affecting the planning of any urban transportation system during the urbanization process. Nevertheless, understanding the land market structure and developing a good land policy system remain key challenges for planners in many countries (UN-ESCAP, 1997). The manner in which a poorly designed land market structure and a poorly managed urban development process adversely affect the local property prices can be observed in Vietnam, especially in its capital, Hanoi city. Vietnam shifted to a market-oriented economy in the late 1980s. Because of the transition from a centrally planned economy to a market-oriented one and a constantly high GDP growth rate over the last two decades, the Vietnamese increasingly demand houses and business facilities of better quality. This has revolutionized the property market and has provided developers with incentives to build more properties. However, prior to the approval of Land Law 2003 in November 2004, the land had no legal or theoretical market value owing to the principle: “people own land, while the State manages land.” After the approval of the Land Law, the State established a statutory pricing formula for calculating land values. Gradually, the differences between the State values and the market values increased. This created a bias in the evaluation of local properties and generated illegal transaction of land use rights and illegal conversion of land use in Hanoi. Such illegal transactions/conversions continue to be serious problems in the Hanoi land market even now. To avoid further land problems in the future, it is critical to understand the property price structure in Hanoi systematically.

This paper aims to analyze the property prices in Hanoi in order to identify the main factors affecting the local property market. The paper is organized as follows. In the following chapter, the past and current land markets in Hanoi are reviewed on the basis of the policies, legal system, and other information related to the property market. Chapter 3 describes the current problems pertaining to property prices in Hanoi. In Chapter 4, the characteristics of property prices are analyzed by using statistical data, and property price functions are estimated by using hedonic price analysis. Finally, in Chapter 5, the paper is summarized and future research topics are presented.

It should be noted that general information and data pertaining to Hanoi before 2008 were used in this study. On August 1, 2008, the National Assembly of Vietnam approved the expansion of Hanoi to include other surrounding areas, namely, Hà Tây province, Mê Linh district (Vĩnh Phúc), and four districts of Lương Sơn (Hòa Bình).

## **2. LAND MARKET AND POLICIES IN HANOI**

### **2.1. Rapid Urbanization**

Hanoi is the capital and the second largest city of Vietnam. With an area of 920.97 km<sup>2</sup>, it covers 2.8% of the total area of Vietnam. The population of Hanoi, which was 2,397,600 in 1996, rose to 3,055,300 (3.9% of the country's total population) in 2003. The population growth rate in the inner city of Hanoi has increased significantly in recent years as a result of the growing annual influx of immigrants from rural areas. The Comprehensive Urban Development Programme in Hanoi Capital City (JICA, 2005) forecasts that Hanoi's population will increase to 4.5 million by 2020. The inner city contains 52.9% of the total population in Hanoi and covers only 9.15% of the total municipal area (Hanoi Statistical Office, 2005). Hence, the inner city of Hanoi is the most densely populated area in Vietnam with 3,415 persons per km<sup>2</sup>. 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 during 1995–2003 from 6.2 million VND to 15.9 million VND (Hanoi Statistical Office, 2005). In line with the overall development trend of the country, Hanoi has undergone rapid urbanization. Historically, most of the urban areas were built near the southern part of the Red River. Development has taken place mainly in the fringe of the built-up areas along major roads. Urban areas have expanded beyond Ring Road 2 and then further to Ring Road 3. Rapid urbanization and the increasing influx of people unavoidably created a shortage of accommodation in the city. The City government aimed to construct a total residential floor area of 3–3.5 million m<sup>2</sup> during 2001–2005 in order to provide an average residential area of 7–7.5 m<sup>2</sup> per person (Hanoi People's Committee, 2000). The latest report indicates that a total residential floor area of approximately 5 million m<sup>2</sup> has been built so far (Hanoi Authority for Urban Planning and Architecture, 2006). Although a floor area of approximately 1 million m<sup>2</sup> is being built every year, housing continues to be a problem in Hanoi; this significantly affects the local land market.

### **2.2 Institutional System on Land Management**

The past institutional system of property rights in Vietnam has been well reviewed by Nguyen and Hans (2002) and the General Department for Land Administration (2000). In this section, the characteristics of land use rights, land transfer, and the land market in Vietnam presented

in the literature are summarized.

### 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). Later, during the socialization of the private sector and trade during 1958–1960, private properties and land were gradually transferred into state ownership. During 1960–1971, most of the lands that were privately owned by farmers were progressively placed under collective ownership and were allocated to agricultural cooperatives and state enterprises. It should be noted that the 1960 Constitution of the Democratic Republic of Vietnam allowed the private ownership of land in addition to state and cooperative ownership. However, it appears that, in practice, land was either nationalized or placed under cooperative ownership following the enactment of the Land Reform Law 1953, although the 1960 Constitution theoretically allowed the private ownership of land. After the reunification in 1975, the 1980 Constitution was adopted; it stipulated that the state retained all land ownership in the country and that no private ownership of land was allowed. Land was allocated through the central administrative control rather than by means of the market mechanism. However, in 1988, the State enacted the Land Law granting land use rights to organizations as well as individuals (General Department for Land Administration, 2000). The principle of eliminating private ownership of land yielded to the concept of “people’s ownership” and “state management” in the 1992 Constitution and 1993 Land Law. Furthermore, as a concession to the emerging mixed market economy, Land Law 1993 granted various private rights pertaining to the ownership of land, which included land transfer and leasing, without altering 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

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

### 2.2.3 Land market

#### *Before the approval of Land Law 2003*

Throughout the socialist period, the purchase and sale of urban residential land/housing occurred through personal networks in the black market with the tacit approval of the local authorities (General Department for Land Administration, 2000). Indiscreet land trade resulted in the voluntary surrender of surplus land. Even after the “nationalization” of private land in 1980, the informal urban housing market continued to function. The State tacitly accepted the commoditization of urban residential land but not that of commercial land. The State valued land use rights using 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, compensation paid for compulsory acquisition, and taxes. Using this formula, the values of land use rights are determined by classifying cities into five classes. The classification is based on the potential for business profitability, infrastructure, and location, i.e., proximity to city centers and major roads, etc. Using the price formula, the State attempted to “scientifically” replicate market price indicators. However, the property prices indicated by the government and the market prices differed significantly.

#### *After the approval of Land Law 2003*

The key features of Land Law 2003 are as follows: formal recognition of real estate markets by relaxing government control of land supply and cost; devolution of the responsibility of land administration and registration from the central government to local governments; use of market values for evaluating expropriation compensation, taxes, and land use fees; public participation in planning; and public notification of approved plans. The Land Law motivated property developers, the majority of which are still state owned, to construct planned developments. The 2003 Land Law introduced significant changes in property prices, not only in Hanoi, but also across the country. After the Law and Decree 188/2004/ND-CP dated November 16, 2006, was enacted, property values were legally recognized. In principle, the prices of land use rights are formulated on the basis of (i) the official property price list established and approved annually by local governments, which must normally be equal to the market property price; (ii) the winning bids made by individuals or organizations for land use rights; and (iii) the agreement among stakeholders on transaction or leasing. All local governments, including those of cities and provinces, are required to publish reports on the local property price lists every year on January 1<sup>st</sup>. Furthermore, the approval of the Real Estate Business Law in July 2006 has created favorable conditions for foreigners and overseas Vietnamese to enter the real estate market, allowing them to provide a wide range of services related to real estate, including brokerage, pricing, purchase and sale, consultancy, auctions, advertisements, and management. This State initiative also aimed to establish a clear legislative framework to ensure transparency in the land market.

## **3. CURRENT PROBLEMS PERTAINING TO PROPERTY PRICES IN HANOI**

### **3.1 Property Price Problems after the Approval of Land Law 2003**

With the enactment of Land Law 2003, the land market in Vietnam changed substantially from being government controlled into a market-based system. Such transition is a big challenge for governments without extensive knowledge and experience in land management. A number of problems pertaining to property prices arose in Hanoi. They included the following.

*Excessively high property prices:* The property prices in Hanoi have increased drastically and are arguably leading to major distortions in the local economy. Local property experts estimated that only 5% of the population could purchase properties at the current inflated prices, which are much higher than the average national income.

*Large fluctuations in prices in the real estate market:* As investors, brokers, and appraisers lack the practical knowledge and experiences required to properly evaluate the actual prices, the property prices in Hanoi are completely subject to the psychological aspects of buying/selling and speculation and are determined by ignoring the real supply–demand scenario in the market. This leads to unstable property prices and, consequently, the “fever” and “freezing” of the land market.

*Lack of proper methods for evaluating property prices:* Decree 188/2004/ND-CP prescribes methods for determining property prices and valuating specific land categories on the basis of local conditions. It also provides property price boundaries, which indicate the maximum and minimum property prices in all cities and provinces. However, there is a significant difference between the actual prices and the prices set by the State. This has created contradiction within the Land Law and has simultaneously caused difficulties in transaction, leasing, taxation, and evaluation of properties.

The problems mentioned above have strongly affected the Hanoi land market. They are arguably leading to major distortions in the national economy since the real estate sector contributes to economic growth significantly. Moreover, because of uncontrolled property prices, the city government is unable to formulate policies required to manage and create a real land market and ensure transparency.

### **3.2 Current Methods for the Evaluation of Property Prices in Hanoi**

#### **3.2.1 Methods used for property price evaluation in Hanoi**

According to Decree 188/ND-CP, the Ministry of Finance and the Financial Authorities are responsible for providing methods to determine property prices annually. Prices are currently evaluated using two methods: (a) direct comparison of the prices of properties with those of similar properties in the same land category that have been previously involved in land use transfers; and (b) the income-based method using which the prices of land categories are determined on the basis of the revenue generated by the land. In practice, the Hanoi Authority for Finance evaluates the property prices in Hanoi. First, surveys on the property prices are conducted by collecting information on land transfer in representative streets; then, using the collected data, the market property price per square meter of the representative parcel of the street and location is determined; subsequently, a comparison method is used to evaluate the property prices of the remaining areas; finally, the results of the evaluation are reexamined by considering socio-economic conditions, income and expenditure/expenses, financial obligations of organizations and individuals, etc., before the annual property price list is released.

#### **3.2.2 Problems in Property Price Evaluation**

Practically, the current property price evaluation method used in Hanoi reflects the actual demand in the market and attempts to meet the requirements of the Land Law. However, there are three problems with this method. Firstly, the government-issued prices do not reflect the actual prices accurately. The property prices issued by the City government are only 30–70% of the actual market price. Secondly, the accuracy of property price evaluation is low because of the lack of information. Although the property price survey in Hanoi is of a considerable scale, the diversity of data is quite limited. For example, the survey covers only the transfer of

residential land use rights. Thirdly, property prices have not been well evaluated from the collected data. The main factors directly or indirectly affecting property prices and the property price structure have not yet been identified. For example, socio-economic and infrastructure conditions, living standards, social services, people's willingness, special characteristics of the parcel (legacy, parcel shape), behavior of land owners (psychology, etc.), and changes in the land market have not been sufficiently analyzed.

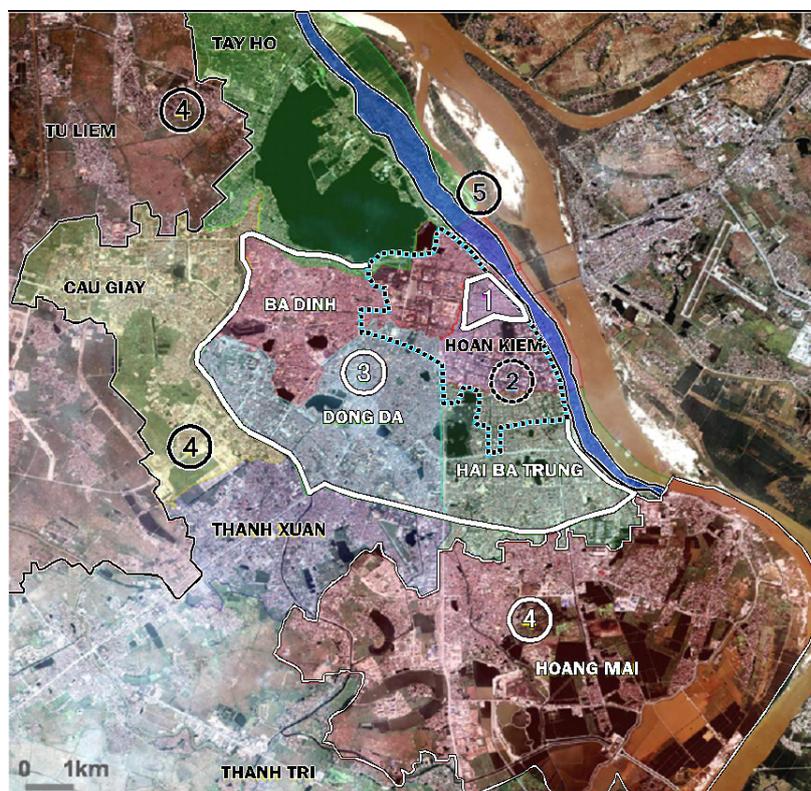
#### 4. PROPERTY PRICE ANALYSIS

##### 4.1 Definitions of Zones in Hanoi

On the basis of its historical development and urbanization, Hanoi can be divided into the following five main zones: the Ancient quarter, French quarter, area built during 1960–1990 (urban core), newly built area after 1990 (urban fringe), and outer dyke area. These zones are depicted in Figure 1. The property prices are analyzed on the basis of these five zones. This is because the land market in one zone is quite independent from the land market in another zone.

##### *The Ancient quarter*

The Ancient quarter is located at the center of Hanoi city. It is a popular urban center attracting many tourists, being an old quarter of Hanoi. This area has been organized since the 15<sup>th</sup> century and was composed of 36 guilds. Note that the guild means an organization of people who do the same job. Each guild was a residential area in which people lived, performed manufacturing activities, and conducted business. The Ancient quarter has become



**Figure 1 Zoning system used in 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

the busiest traditional, commercial, and residential district with the highest density of enterprises and people in Hanoi. The Ancient quarter remains a large trade center and retains its original historic character. At present, this quarter contains about 80,000 persons in a total area of about 100 ha. 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 that of Hanoi (JICA, 2005). The land use pattern in the Ancient quarter is highly mixed. Most of the area is used for residential and/or commercial purposes.

Many households run their businesses at home. The buildings in this area are typically located on a longitudinal land plot with the façade to the street. The front part of the building is used for business activities, whereas the rear part is used for residential purposes. The road network in this zone was developed spontaneously without any schematic planning. The ancient streets were originally constructed mainly as trade routes. As is often the case with very old cities, the street density in the Ancient quarter is very high at a road–area ratio of 23.5% (JICA, 2005). The streets are mostly narrow with the width of the carriageway varying from 6 m to 9 m. The sidewalks are normally narrow and have widths ranging from 2 m to 4 m. The current infrastructure system in the Ancient quarter is insufficient and poor. This results in problems such as urban environment pollution, poor living conditions, and public health deterioration. Because of rapid economic development and increased demand of urban services in residential and commercial areas, the old and insufficient infrastructure has reached the limits of its capacity.

#### *French quarter*

The French quarter was built during French colonization from 1873. This zone surrounds the Ancient quarter and has an area of approximately 718 ha. It includes the southern part of the Hoan Kiem district, the northern part of the Hai Ba Trung district, and the eastern part of the Ba Dinh district, and has a population of around 200,000 (JICA, 2005). The French quarter is well known as the political and administrative center of Hanoi city, where most of the central government and diplomatic offices are located. French colonization introduced elements of Western architectural design to urban planning in this zone, which has a grid network of wide avenues. The average road–area ratio is about 16.5% (JICA 2005). The infrastructure system was developed in a well-organized manner along with the residential properties and the street network. At present, most of the road network and infrastructure are based on the original designs and are in as good a condition as when they were built. In terms of land use, this zone can be divided into two sub-areas: the official area and the residential and business area. The official area is located mainly around the southern part of the Hoan Kiem Lake and in the northwestern part of the Ancient quarter. The residential and business area is located in the northern and southern parts of this zone. Most of the houses in this area are villas and large detached houses, which were mainly built by the French in the Western style. With time and because of political changes, the architectural style of the houses in this zone has deviated from the original. After the withdrawal of the French from Hanoi, old French houses were allocated for different purposes. Some houses were used as government offices whereas other houses were divided into several small parts to accommodate many households. This zone has the largest share of parks and open space among the five zones of Hanoi. Consequently, the environmental and living conditions are quite favorable. Many Hanoians aspire to live in this quarter.

#### *Area built during 1960–1990*

This zone was built during the 30 years when Vietnam was a centrally planned economy (from the 1960s to the 1990s.) Its area is approximately 2,641 ha including the western part of

the Ba Dinh district, the entire Dong Da district, and the southern part of the Hai Ba Trung district. This area has 774,000 inhabitants (JICA, 2005). This area was mainly built by replicating the model of production and social organization derived from the planning principles of the former Soviet Union. About 45% of this zone is used as the institutional area of the urban core, with government, educational, health-, and security-related institutions mainly located in the Dong Da and Ba Dinh districts. Large industrial areas can also be found in the south of the Hai Ba Trung district. The residential property in this zone can be divided into two types. The first type includes five-storied residential buildings, which were developed about 20 years ago. These residential neighborhoods were designed to accommodate 7,000 to 12,000 inhabitants in an area of 15 to 25 ha. The first type also includes social service facilities such as kindergartens and schools. The second type consists of villages that have been integrated into the inner city, such as Kim Lien, Bach Mai, Van Chuong, Giang Vo, Vinh Ho, Khuong Thuong, and Trung Tu. Houses in these villages were mostly built independently and have dissimilar styles and characteristics. Most of these houses have gardens. The road network is often inadequate mainly due to the historical development pattern of these villages. The road–area ratio is only 3.5% in the majority of communities (JICA, 2005). There are many locations with serious traffic problems, mainly due to heavy traffic congestion. The infrastructure system comprising the water supply, sewerage, and drainage systems is also inadequate. The living environment in this zone is undesirable as many water bodies are polluted.

#### *Area built after 1990*

This zone is located outside Ring Road 2 and has an area of 12,966 ha. It has been developing since the 1990s during the dramatic urbanization of Hanoi under a market-oriented economy. It includes the four urban fringe districts, namely, Tay Ho, Cau Giay, Thanh Xuan, and Hoang Mai, and the urban land area in the two suburb districts Tu Liem and Thanh Tri. This zone has around 784,000 inhabitants (JICA, 2005). Although the current population density in this area is low at present, it has been growing at 6.5% of the average annual population growth rate over the past five years. It should be noted that the average annual population growth rate in Hanoi city is 2.7%. One of the reasons for the rapid increase of population is the high rate of urban development in this area. Most of the urban development projects in the area are medium sized, covering approximately 80–100 ha; exceptionally, the Ciputra Urban Area now covers 300 ha. Residential development projects and new urban area projects have been carefully planned and implemented simultaneously. The master plan, which recommends a modern housing network comprising comfortable and spacious, low buildings with modern architecture, is strictly followed. Infrastructure systems such as a transportation network, electric power and gas supply systems have been built maintaining high technical standards. Public services such as schools, hospitals, and open green spaces have also been synchronously designed and built, consequently creating a very modern living environment for Hanoians. The development of this area is considered a landmark in the urban planning of Hanoi and attracts new residents. Besides the residential and commercial development plans, the new transportation network development plan has also been rapidly implemented. Many major asphalt roads with widths ranging from 40 to 100 m have been constructed in this area. Although the road–area ratio is just 6.5% at present, it is expected to reach 20% within the next 10–15 years if the implementation of the development plans progresses as planned.

#### *Outer dyke area*

This zone is located near the outer dyke along the Red River. According to the Ordinance on dyke management, any kind of construction in this zone is illegal. Nevertheless, people have been living in this area since the 1950s. At present, the outer dyke area is one of the most

highly 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-storied houses built on a temporary basis. During the flood season, most of the roads and houses are inundated under 1.5–3-m-deep floodwater. 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 and increase the river flood level, resulting in increased flood risk in Hanoi City. The road network in this zone is not complete and mainly comprises 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. The dominant land use pattern in this area is urban residential and mixed use. The population is also mixed, with government employees, enterprises, traders, self-employed workers, and agriculturalists being located in this area.

## 4.2 Property Price Analysis

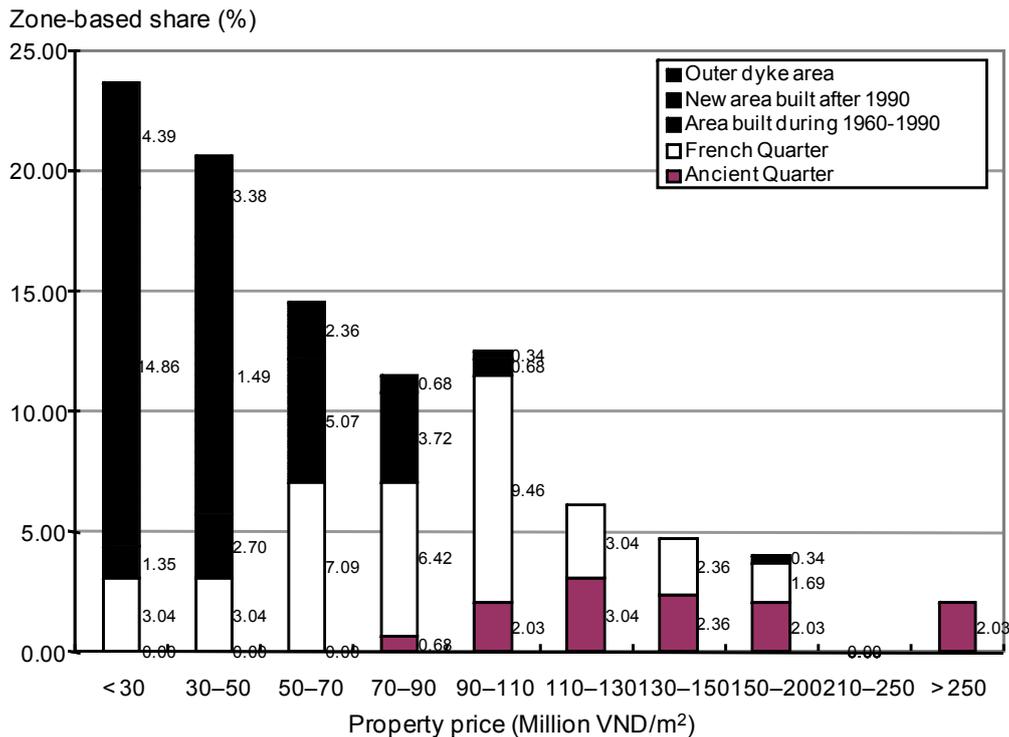
### 4.2.1 Data

We used the 2006 property price data collected by the Hanoi Authority for Finance (HAF) for the property price analysis. The HAF survey collected data pertaining to property transactions in 394 streets in 10 districts of Hanoi. The HAF interviewed persons involved in real estate transactions using a survey questionnaire. The questionnaire requests interviewees to provide their address, location, distance to the nearest street, house information including type and quality, area and figure of the parcel, infrastructure conditions, legalities, transaction price, and transaction time. A total number of 1,543 records were selected for our analysis from 5,948 available records. This was done because (a) some of the properties included in the original dataset are located outside our selected research zones, and (b) we considered only records containing all necessary information (such as the address of the property) as valid data for our analysis. The price distribution obtained from the sample data and the zone-based shares are shown in Figure 2.

Figure 2 shows that the property prices in Hanoi vary over a wide range, from less than 30 million VND per square meter up to more than 250 million VND per square meter, but are mostly less than 50 million per square meter. It is also shown that the property prices in the outer dyke area and the new area built after 1990 vary over a very narrow range, from less than 30 million VND per square meter to 30–50 million VND per square meter, whereas in other areas the prices vary greatly. The prices in the area built during 1960–1990 vary from less than 30 million VND per square meter to 90–110 million VND per square meter. In the French quarter, the prices are slightly higher than the average price and vary over a wider range, from less than 30 million VND per square meter to 150–200 million VND per square meter. In contrast to the other areas, the property prices in the Ancient area are rather high, varying over a slightly narrower range than the French quarter from 70–90 million VND per square meter to more than 250 million VND per square meter. These findings show that property prices decrease as the distance from the city center increases. It should be noted that the property prices in Hanoi are higher than the average income in the city (Sieu, 2006). The average household income in 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

Generally, accessibility to the transportation network is one of factors that have a major impact on property prices. In the case of Hanoi, because of the poor public transportation system and the lack of an extensive road network throughout the city, accessibility to an adjacent street from the house is expected to be one of the most important factors affecting



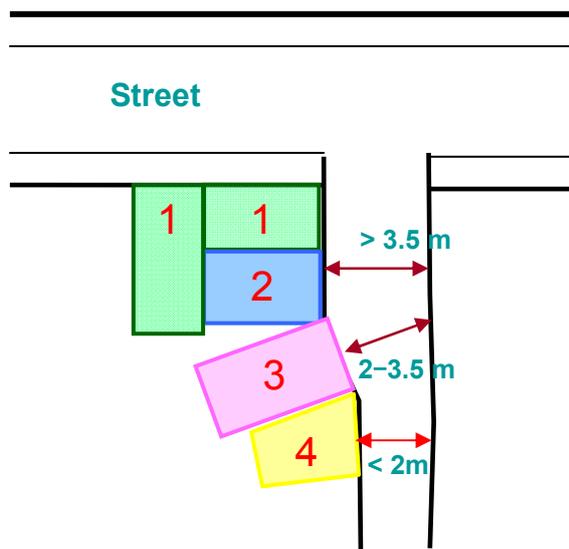
**Figure 2 Property price distributions obtained from sample data**

property prices. The City government defines four types of locations, as shown in Figure 3. Location 1 represents the property along the street—usually a mixed-use house utilized for exclusively commercial or both commercial and residential purposes—whereas locations 2, 3, and 4 are mainly meant for residential use.

The relationship between the property price of location 1 and the property prices of location 2, 3, and 4 in the Ancient quarter is shown in Figure 4. The property price of location 1 is always higher than that of any other locations in the same street. This is because location 1 can be used for business activities, e.g., for operating a shop or a rental office which generates income. Further, the property prices decrease as the accessibility to the street decreases: location 4 is usually observed to have the lowest price; location 1, the highest. The property price of location 2, which is mostly used for residential purposes but has easy access to the street is strongly correlated to that of location 1, while the houses in locations 3 and 4 are less correlated to that of location 1. Furthermore, in the streets with the highest property price in Hanoi, the property price of location 1 is extremely high in comparison with those of the other locations.

#### 4.2.3 Estimation of Property Price Functions

The hedonic price analysis is used for estimating property price functions. In the hedonic price method, the property price is assumed to be a function of a group of attributes, which can be thought of as made up of two parts: internal factors and external factors (Rosen, 1974; Kanemoto, 1988). Internal factors consist of the physical characteristics of the house, such as house area and the number of floors, whereas external factors include accessibility to the transportation network and the environment in the neighborhood. Note that one of the ideal conditions for applying the hedonic approach is that the market is stable. However, the land market in Hanoi is dynamically changing as shown earlier. Then, it is assumed that any purchaser in the market is capable of foreseeing a dynamic change in land price. This assumption may be reasonable if the purchasers share the market information. Although our



- Notes:
- Location 1: House has at least one side to the street;
  - Location 2: House has at least one side to alleys that have a minimum width of more than 3.5 m;
  - Location 3: House has at least one side to alleys that have a minimum width of 2 to 3.5 m;
  - Location 4: House has at least one side to alleys that have a minimum width of less than 2 m.

Figure 3 Definitions of property locations

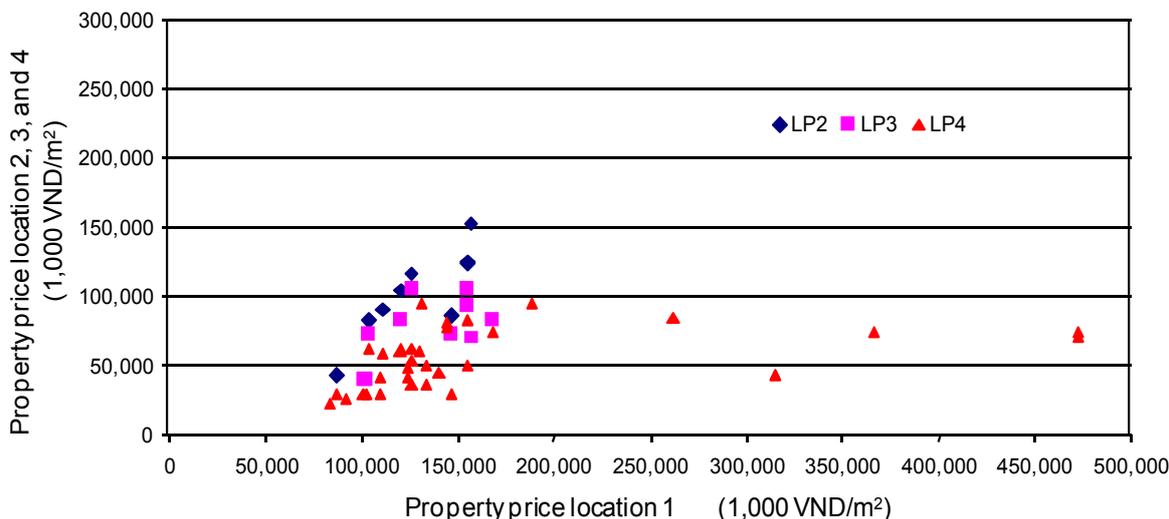


Figure 4 Relationship between the property price of location 1 and those of locations 2, 3, and 4

local interviews unveils that the information of local market is well-shared by local people, to verify the above assumption in more details is one of our further study issues.

The variables used in our estimation are defined in Table 1. *Location* is defined on the basis of the Government’s definition, as shown in Figure 3, as follows: 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 the property to the nearest street is less than 50 m; 2, if the distance from the property to the nearest street is between 50 and 100 m; 3, if the distance from the property to the nearest street is between 100 and 150 m; and 4, if the distance from the property to the nearest street is more than 150 m. *Direction* is defined as 1 if the property faces the southeast direction; and 0, if it does not. This variable is introduced because Vietnamese prefer houses that face the south, east, and southeast directions. This might be a result of the climate in Vietnam, which is characterized by a strong monsoon and is divided into cold or hot seasons. *Legal* is defined as 1 if the house has a land use right certificate; and 0, if it does not.

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

Variables	Definitions	Data sources
<b>Housing characteristics</b>		
<i>Location</i>	Location of the house with respect to the street	HAF 2005
<i>Distance</i>	Distance from house to the nearest street	HAF 2005
<i>Shape</i>	Shape of the house (length/width)	HAF 2005 + Calculated
<i>Lot</i>	Area of the house (m <sup>2</sup> )	HAF 2005
<i>Floor</i>	Number of floors	HAF 2005 + Calculated
<i>Direction</i>	Direction of the house	HAF 2005
<i>Year</i>	Year in which the house was built (year)	HAF 2005
<i>Type</i>	Structure of the house	HAF 2005
<i>Legal</i>	Ownership	HAF 2005
<i>Price</i>	Property price (Million VND/m <sup>2</sup> )	HAF 2005
<b>Neighborhood characteristics</b>		
<i>RoadRatio</i>	Road–area ratio (%)	HAIDEP
<i>WaterSup</i>	Water supply–Peoples’ assessment index	HAIDEP
<i>Safety</i>	Safety/ Security–Peoples’ assessment index	HAIDEP
<i>AirQua</i>	Air quality–Peoples’ assessment index	HAIDEP
<i>Flood</i>	Flood vulnerability–Peoples’ assessment index	HAIDEP
<b>Accessibilities</b>		
<i>CBD</i>	Distance to the city center (m)	Calculated
<i>Lake</i>	Distance to the nearest lake (m)	Calculated
<i>Work</i>	Time taken to travel to work (min)	HAIDEP
<i>Hospital</i>	Access to health care–Peoples’ assessment index	HAIDEP
<i>Park</i>	Access to parks and green spaces–Peoples’ assessment index	HAIDEP
<i>School</i>	Access to schools–Peoples’ assessment index	HAIDEP
<i>Transit</i>	Access to public transport–Peoples’ assessment index	HAIDEP

The results of the estimation are shown in Table 2. The relationship between the estimated price and the observed price are also shown in Figure 5. The results pertaining to the Ancient quarter show that the variables that significantly influence property prices are *Location*, *Age*, *Work*, *Transit*, *RoadRatio*, and *WaterSup*. We found that property prices in the Ancient quarter were not affected by *Floor* because most of the houses in this zone are shared-use houses. Households residing in such houses usually own only one or two rooms inside the house and have to share common spaces such as the staircase, lobby, and toilets. Further, we found that *Distance* does not affect property prices in the Ancient quarter because in the Ancient quarter, most of the houses are “tube houses,” and long alleys are absent; thus, that distance from the houses to the street is usually around 50 m. The results pertaining to the French quarter show that the significant factors affecting property prices are *CBD*, *Distance*, *Floor*, *Legal*, *Location*, *Lot*, *Park*, *RoadRatio*, *Shape*, and *Work*. The high fitness of the estimated function indicates that the properties in the French quarter might be traded in a more reasonable or transparent manner than those in the other areas. The results pertaining to the area built during 1960–1990 show that *Built*, *Distance*, *Floor*, *Location*, *Safety*, and *WaterSup* are the significant factors affecting property prices. Figure 5 shows that properties priced at over 120 million VND/m<sup>2</sup> are underestimated, although most of the data are scattered around the correlation line. The data sources indicated that most of the properties with high prices are located on the three streets named Kim Ma, Dang Van Ngu, and Vo Thi Sau. These streets are located in the busiest areas in the zone and line properties that have extremely high prices. We hypothesize that the prices of these properties are underestimated because the manner in which they are traded is different from the manner in which other properties are traded. Therefore, we reestimated the price function after eliminating data pertaining to the properties that have been underestimated. However, the correlation coefficient did not improve

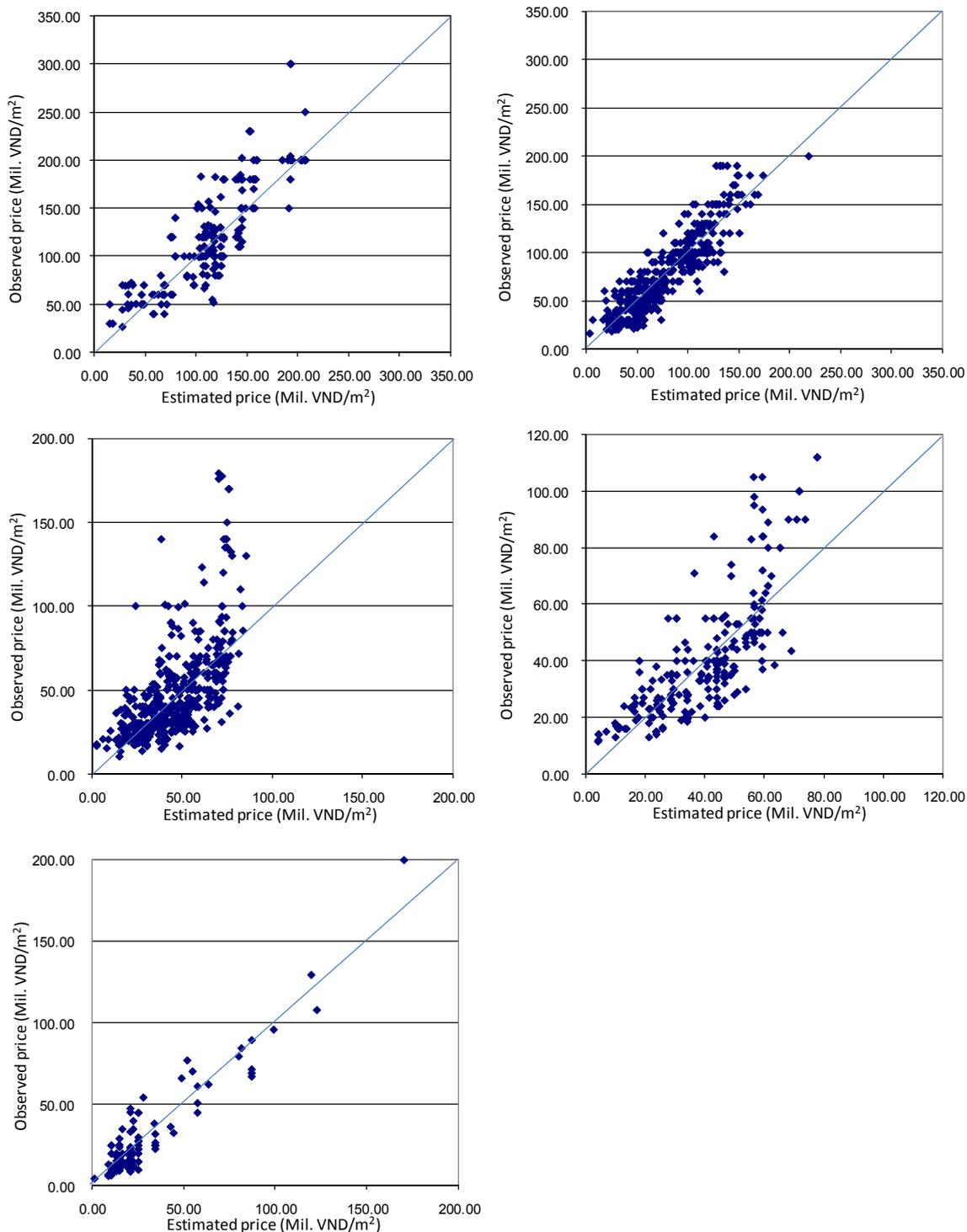
**Table 2 Results of the estimation of hedonic property price functions**

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.
<i>CBD</i>			-0.01	-7.66						
<i>Built</i>	0.29	3.28			0.30	2.37				
<i>Distance</i>			-5.65	-4.00	-3.01	-2.80			-6.01	-7.31
<i>Flood</i>									12.45	2.30
<i>Floor</i>			4.14	4.58	3.29	2.75	2.82	3.00	29.61	18.63
<i>Legal</i>			10.93	5.48						
<i>Location</i>	-25.22	-16.02	-16.95	-18.16	-12.41	-8.77	-12.52	-15.21		
<i>Lot</i>			0.12	8.02						
<i>Park</i>			13.56	2.91						
<i>RoadRatio</i>	6.37	5.89	3.14	14.52			1.41	5.77		
<i>Safety</i>					18.99	2.75				
<i>School</i>									18.77	2.15
<i>Shape</i>			-2.41	-4.18			-0.50	-1.94		
<i>Transit</i>	40.34	2.96								
<i>WaterSup</i>	46.41	2.16			9.29	3.68	5.14	3.20		
<i>Work</i>	-5.81	-9.85	-4.15	-7.65			-0.96	-2.83		
<i>Constant</i>	-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	

significantly ( $R^2 = 0.47$ ). Further examination is required to identify the reasons for this small change in correlation coefficient. The significant factors affecting property prices in the area built after 1990 are *Floor*, *Location*, *RoadRatio*, *Shape*, *WaterSup*, and *Work*. It should be noted that the road network in this zone has been properly designed, and, therefore, besides *Location*, the road network has the most significant effect on the choice of a residence. Moreover, this zone contains many newly built urban development projects. It is expected that the people living in this zone are more concerned with the lot size of the house rather than the accessibility to CBD. The results pertaining to the outer dyke area show that *Flood*, *Floor*, *Legal*, and *School* significantly influence the property prices. It is reasonable that *Floor* has very high significance with respect to the property prices in the outer dyke area since this zone is usually inundated under 2–3-m-deep water during flood season. Additionally, as there are many low-income residents in this zone, the accessibility to schools is also a critical factor. The reason for the high correction rate might be that the property prices in this area are clearly dependent on the living conditions represented by the explanative variables used in our analysis.

#### 4.2.4 Discussion

*Location* and *Floor* are components of the estimated price functions pertaining to four zones out of five. In particular, *Location* has high *t*-statistics for the four zones. This indicates that the local people are highly concerned with the location of their houses, as presumed. In terms of neighborhood characteristics, *RoadRatio* and *WaterSup* were found to be significant factors in the estimated functions. This is probably because the local people consider these two factors to be more important than other factors since Hanoi has an inadequate road network and water supply system. *Safety*, *AirQuality*, and *Food*, which represent the environment conditions, were found to have no impact on the property prices in all zones. Unexpectedly,



**Figure 5 Relationship between estimated and observed property prices**

*Direction* was found to have no impact on the property price. It was also unexpected that *Legal* is a significant factor only in the French quarter. These findings indicate that the local people might be less concerned with these factors when purchasing properties. Accessibility factors such as *CBD*, *Park*, *School*, and *Transit* are included in only one price function, while *Hospital* is not included in any of the price functions. This means that the local people are not concerned with accessibility to the nearest medical care facility. For example, in reality, local people usually do not use the nearest medical care facilities but choose those that are farther

away but provide a better service. It was found that the distance to CBD does not influence the property prices, although Figure 2 shows that the longer the distance from the city center, the lower is the property price. It should be noted that this does not hold true in the outer dyke zone because of two probable reasons. Firstly, the variation in the distances in the zone is too small, and the distances to CBD from within the zone vary over a narrow range from 2 to 7 km. Local residents might not perceive the difference in the distance to CBD from various locations in the zone because the distances are too small. Secondly, the property price in Hanoi is not directly affected by the distance to CBD but might be influenced by psychological factors, which include historical status and the lifestyle in the Ancient quarter.

## 5. CONCLUSIONS

We reviewed the past and current land policies in Hanoi, Vietnam, and analyzed the local property prices in order to identify the main factors affecting the local land market. The institutional systems associated with the land market in Vietnam have been changing dramatically for several decades; this has created various problems, including instable property prices. The current property price evaluation in Hanoi reflects the actual demand in the market and attempts to meet the requirements of the Land Law. However, it still suffers from the lack of data and knowledge pertaining to the land market. We analyzed the property prices in Hanoi by using the hedonic price method in order to understand the property price structure. Property price functions were estimated for five zones in Hanoi. The results show that various factors such as the location of the property with respect to the nearest street, number of floors, and road ratio affect the property prices significantly. The results of the property price analysis indicate that, in principle, a rudimentary property market has been established to some extent in Hanoi. The major factors controlling property prices in all zones are well defined. The correlation coefficient of the property price functions derived by performing multiple regression analyses on hedonic price models in these zones were found to be at the acceptable level. However, the fitness of the estimated price functions pertaining to the area built during 1960–1990 is not good. The factors affecting the property prices in this area should be examined in more detail.

Two recommendations are drawn from the results of our analysis. First, it is suggested that the hedonic price analysis may be applied to estimating the land prices in order to improve the accuracy of the government-issued prices in Hanoi. This is because our analysis shows that the structure of land price varies among zones. Second, the estimated price functions show us that the quality of infrastructure including water supply, security, air quality, and flood safety influences positively the land price. As the land price reflects the quality of life, the positive impact of infrastructure on land price means that more investment of infrastructure leads to better quality of life. Then, it is highly recommended that the government should take further efforts to invest these infrastructures to increase the quality of life in Hanoi.

Finally, it should be noted that the property price in the Ancient quarter is extremely high although this zone has poor living conditions. The Ancient quarter also has very strict building regulations in accordance with the historical preservation policy of the Hanoi administration. In order to explain the exceptionally high property prices in the Ancient quarter, it may be necessary to consider other factors that affect the local people's choice of residence. These factors might include social and business aspects, lifestyle, etc. (Phe and Nishimura, 1990) and should be studied further.

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