THE URBAN HOUSING MARKET IN A TRANSITIONAL ECONOMY: SHANGHAI AS A CASE STUDY

Zhigang Tang

Submitted to the faculty of the Graduate School
in partial fulfillment of the requirements
for the degree Doctor of Philosophy
in the Department of Geography
The Indiana University

May, 2006

ACCEPTANCE

Accepted by the Graduate Faculty, the Indiana University, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Oct. 31, 2005
Date of Oral Examination

Doctoral
Committee

Dr. Daniel Knudsen, Chairman

Dr. Dennis Conway

Dr. John Odland

Dr. Michael V. Alexeev

ACKNOWLEDGEMENTS

This dissertation is dedicated to my parents, Weisheng Tang and Dezhen Tan, and my wife, Yan Zhang. Without their support and understanding, I would not be able to focus on my studies and research and finish my dissertation. I would also like to especially thank friends Zhigang Li, Jun Luo, Zhaohui Han, and Long Kang who offered intellectual support to my research.

I also wish to thank my doctoral committee, Dan, Dennis, John, and Michael, who suggested numerous worthwhile improvements in this dissertation and guided my progress at Indiana University with a watchful eye. Thanks are also due to the people I interviewed in Shanghai. Lastly, I wish to acknowledge and thank the geography and economics faculty, and my many colleagues and friends in the geography and economics departments.

Abstract

The urban housing market has been an important research topic for urban geographers and urban economists. After 1990 when former communist regimes were transformed from planned to market-oriented economies and globalization accelerated, the urban housing markets of the transitional nations attracted increasing attention from academia. Most of these studies addressed housing market structure, housing price and residential location. Similarly, this research examines housing market structure and housing price in the newly established housing market in Shanghai.

This research begins with an exploration of market structure and market players and the interactions between them. Market structure sets the framework within which market players' maximize their market related interests. China's reform and its integration into the world economy have brought many players into its urban housing market. These players not only have unique interests in the market but also share common interests to some extent. Players include international institutions, private companies, and traditional forces, such as the government and work units. It is necessary to understand market structure and players and how they interact because this knowledge is fundamental for any further investigation of the market. Moreover, the analysis of market structure and market players adds texture to the following empirical analysis.

Housing price is another focus of this research. The determinants of housing price and the geographical distribution of housing price are the main research topics of housing price studies. Previous literature has documented the effects of houses' structural and

locational characteristics on housing price. However, they rarely pay attention to the influences of ‘macro factors’ (such as FDI, economic transition (ET) and urban transformation (UT)) on housing price, although these factors do play crucial roles. Using hedonic modeling techniques, this research conducts quantitative analyses of the impacts of ‘macro factors’ on housing price. The hedonic models are fitted for both the whole housing market and individual submarkets. Since the modeling results may be affected by definition of submarkets and there are many methods to delimit the submarkets, this research also explores an appropriate method of market segregation for Shanghai’s housing market.

INDEX

List of Tables

List of Figures

List of Maps

List of Pictures

Chapter 1 Introduction

Housing is one of the most important inputs of human resource production. A well-established urban housing market benefits urban residents, various institutions that employ urban residents, city economies, and even the national economy. From a global viewpoint, housing markets are crucial to the relative success or failure of the competitive stance of cities in the emerging global economy (Kauko 2001). Accordingly, housing markets have been one of the important research subjects of academia (Adair *et al.* 1994, 1996, Alain *et al.* 1995, Bajic 1985, Ball 1977, Berry *et al.* 1971, Bourassa *et al.* 1999, Bourne *et al.* 1978, Bramley 1993, Can 1990, Dale-Johnson 1982, Dowall 1993, Edelstein 1974, Goodman and Kaiwai 1986, Harvey 1982, 1985, 1989, Healey and Barrett 1990, Kauko 2001, Keivani *et al*. 2001, Olmo 1995, Ong and Sing 2002, Orford 2000, Palm 1978, Watkins 2001, Wu 1998, 2001, 2002b). For geographers, the traditional topics of urban housing market study are: housing market structure and players, housing price, and housing submarkets (Bramley 1993, Can 1990, Giussani and Hadjimatheou 1992, Healey and Barrett 1990, Keivani *et al.* 2001, Olmo 1995, Ong and Sing 2002, Orford 2000, Palm 1978, Stutz and Kartman 1982, Watkins 2001, Wu 1999, 2001).

Market structure is the framework within which individual agents make their choices (Healey and Barrett 1990). Specifically, the term market structure refers to resources, rules and ideas that drive the operation of the market and guide the behaviors of market players. On the other hand, the market structure and its power and influence are constrained and altered by a large number of competing market players/market agencies (Shlomo *et al.* 1983) that are the active components of the urban housing market (Han and Wang 2003, Healey 1992, Healey and Barrett 1990, Teixeira 1995). The primary

goal of market players is to maximize their gains from the market. In the urban housing market, the market structure and players are interactively related (Han and Wang 2003, Healey and Barrett 1990). Structure sets the framework for players while players, in order to maximize their gains, attempt to reframe the structure (Healey 1992, Healey and Barrett 1990).

In Western countries, because of an established market structure, the role of each player is clear and, most times, exclusive. However, in transitional economies, because the housing markets are newly set up, old political and economic structures still have influential impacts, which means that the roles of market players in transitional economies might be difficult to identify. For this reason, the housing market in transitional economies such as Central and Eastern European countries, Russia and China has recently become the subject of intense scrutiny by geographers and other social scientists (Adair *et al.* 1999, Han and Wang 2003, 2004, Huang 2003, Keivani *et al.* 2001, Parsa and Keivani 1999, Pichler-Milanovich 2001, Wu 1998, 1999, 2000, 2001, 2002a, 2002b, 2003, Wu and Yeh 1999, Xie *et al.* 2002, Yeh and Wu 1996, Yeung 1996, Yusuf and Wu 2002, Zhang 2001). The primary questions that need to be answered in this portion of the research are: *What are the important components of a transitional economy's housing market structure? Who are the major players in a transitional economy's urban housing market? What are their roles and relationships? How have the roles of the various market players changed? And what are the influences of FDI, economic transition and urban transformation on the market structure and players in a transitional economy's housing market?*

It is widely accepted that housing price levels are determined by housing features (Adair *et al.* 1996, Bowen *et al.* 2001, Dale-Johnson 1982, Halvorsen 1981, Linneman 1980, Michaels and Smith 1990, Palmquist 1991, Rosen 1974, Straszheim 1974). Traditionally, housing features can be categorized into two groups, namely, locational characteristics and structural characteristics (Dale-Johnson 1982, Olmo 1995, Ong and Sing 2002, Orford 2000, Palm 1978, Rosen 1974, Straszheim 1974, Watkins 2001). There is no doubt that these two groups of factors can explain many of the differences in houses' prices (Dale-Johnson 1982, Olmo 1995, Ong and Sing 2002, Orford 2000, Palm 1978, Rosen 1974, Straszheim 1974, Watkins 2001). However, housing price is also affected by 'macro' factors (Adair *et al.* 1999, Bramley 1993, Parsa and Keivani 1999, Huang 2004, Lipscomb 2003, Wong and Zhao 1999, Wu 1999). For example, government policies and regulations, particularly those associated with urban/regional development planning or zoning, may directly cause variation in housing price, while other policies, such as those discouraging intercity immigration, have indirect influences on housing price (Bramley 1993, Parsa and Keivani 1999, Huang 2004, Pichler-Milanovich 2001, Wong and Zhao 1999, Wu 1999). Another 'macro' factor, foreign direct investment also affects housing price (Adair *et al.* 1999, Parsa and Keivani 1999, Keivani *et al.* 2001, Wu 2001, 2003). For instance, foreign direct investment (FDI)[1] causes an increase in the demand for housing and thus stimulates housing price (Wu 2001, 2003). Last but not least, the effect of urban infrastructural transformation (UT) on housing price should not be ignored (Chen and Parish 1996, Wu 1998). For example, the

[1] FDI is defined as an investment involving a long-term relationship and reflecting a lasting interest and control of a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (UNCTAD 1997).

construction of a new city center will improve the locational advantages of the adjacent area consequently causing housing in the area to become more valuable, and potentially leading to a price decrease in other areas (Olmo 1995, Kauko 2001). Although it is commonly thought that FDI, economic transition and urban transformation are homogenous across the urban housing market, variation exists in different areas of a city (Wu 1999, 2002a). The effects of FDI, economic transition and urban transformation occasionally can be individualized to each property (Bramley 1993). In the geography and economics literature, it is a common practice to use a hedonic price model to examine the impacts of various housing attributes on housing price. In a hedonic model, the coefficients are referred to as 'implicit prices' (Rosen 1974) of the attributes while the signs of the coefficients indicate the positive or negative impacts of the attributes on housing price.

Since the 1980s, the political and economic structure of China has undergone fundamental changes. As a result, a housing market, which originally did not exist, emerged and developed. Economic transition, foreign direct investment and urban transformation played important roles in this emergence. Without them, current housing markets in China might look very different. However, current studies that discuss the effects of FDI, economic transition and urban transformation on housing price are limited. Therefore, a relatively comprehensive study using both qualitative and quantitative methods to investigate the impacts of FDI, economic transition and urban transformation on housing price is needed. Taking Shanghai, China as the research site, this research will examine the question: *What are the impacts of economic transition, foreign direct investment and urban transformation (UT) on housing price?*

Since locations and the physical structure of houses are diversified and the demand for houses is heterogeneous across housing consumers, the urban housing market should not be considered as a single fully-integrated entity (Adair *et al.* 1996, Allen *et al.* 1995, Bourassa *et al.* 1999, Goodman 1981, Hancock 1991, Tu 1997). In fact, using certain segregation methods, the market can be stratified into many small-scale markets, i.e. submarkets (Adair *et al.* 1996, Allen *et al.* 1995, Bourassa *et al.* 1999, Goodman 1981, Hancock 1991, Tu 1997). Because of the existence of housing submarkets, a city-wide hedonic model may be misleading and meaningless in some cases. A more appropriate way is developing the hedonic models city-wide and for each submarket. The proper method to delimit submarkets is very important because different definitions of submarkets may result in different signs and significance levels of the coefficients. However, while most researchers admit that housing submarkets do exist, there is still no consensus on the best method used to define submarkets. Three different methods, structural submarket stratification, locational submarket stratification, and joint submarket stratification have been developed based on different visions of the composition of the urban housing market. One reason for the different visions is that housing markets are different across cities. The other is that empirical research has been insufficient to develop a general method. In practice, which method should be used is mainly contingent on the research purpose and the conditions of the research site (Orford 2000, Watkins 1999, 2001). To address this methodological problem, more empirical studies on housing submarkets in different cities are needed. This research will explore the submarkets in Shanghai's housing market and try to establish a better way to define

housing submarkets. Based on the examination, this research will answer the question: *What is the best way to define submarkets?*

The next chapter, Chapter 2, is the literature review. This is followed by a description of the research methodology in Chapter 3. Chapter 4 provides an introduction to the Shanghai housing market. Chapter 5 investigates the housing market structure and players in the Shanghai housing market. Chapter 6 contains the results of the hedonic pricing analysis for Shanghai. Chapter 7 contains a summary and conclusions.

Chapter 2 Literature Review

Literature relevant to the housing market has been classified by Baxter and Anthony (1971) into three groups: (a) economic models of the housing market (market dynamics/equilibrium, housing price models, etc.); (b) residential development models; (c) residential location models (location choice models). Since this generalization was made decades ago, it now looks incomplete in that it does not include the studies on housing market segregation and housing market structure and players. A more general and complete classification should also include submarket investigation and institutional analysis of market players and structure. For the purpose of this research, only the literature on housing market price, submarkets, and housing market players and structure will be reviewed. I will first review the literature on China's economic transition, globalization and urban transformation and the urban housing market.

2.1. Economic Transition, Globalization and Urban Transformation

Since the research is to explore the influence of economic transition, globalization and urban transformation on urban housing, it is necessary to give a brief review of economic transition, globalization and urban transformation before conducting the empirical study.

2.1.1 Economic Transition

Economic transition, also called economic liberalization, deregulation and privatization (Sykora 1994, Rana 1995), refers to the economic reforms in a transitional economy that is "one kind of emerging economy … belonging to that category of countries where there is a shift from a command economy to a market economy" (Kumssa and Jones 1999, p.194). The shift includes changes not only in the political

economy, but also in the organization of urban and land development and in the functions of urban planning (Table 2-1) (Wu 1998).

Table 2-1: Implications of the economic transition (Wu F. 1998)

Political Economy	Organization of urban and land development	Functions of urban planning
increasing localization, diversification of investment and the growth of foreign capital	from project-specific to comprehensive development, real estate development	from sectoral-subordinated to a municipally based control

Commonly, transitional economies refer to Central and Eastern European countries, Russia, China and Vietnam. Based on the type of reform introduced, transitional economies may be divided into two groups. The first group includes China and Vietnam where a gradual and cautious approach is being undertaken (Kumssa and Jones, 1999). The second group of transitional economies includes some Central and Eastern European countries, some independent states of the former Soviet Union, and Mongolia, where a "big bang approach" or "shock therapy" was employed (Kumssa and Jones 1999, p.196).

Housing reform is one of the most important transformations in transitional economies. It aims at promoting market efficiency and distributional equity (Pichler-Milanovich 2001), improving housing consumption, creating a housing market (Huang 2003) and solving housing problems, such as unrecoverable housing investment and housing shortages resulting from constrained investment (Wu 2001). Two main pillars of these market-oriented housing reforms, namely, the restitution of private property and privatization, have greatly influenced the development of local real estate markets (Keivani *et al*. 2001). The effects are mostly in the form of "tenure change, differentiation in house prices, use of the housing stock, management and maintenance activities,

mobility, residential differentiation, property rights regulations (i.e. zoning, rules, property register, condominium law, tax, etc.) and institution building and strengthening" (Pichler-Milanovich 2001, p.145).

The most frequently addressed impacts of housing reform on housing markets are the institutional changes, which include three aspects. First, housing investment has diversified. According to Wu (2001), housing reform was characterized by decentralization of housing investment, especially from the central budget to diversified capitals (including funds from foreign investors, state work-units, local governments, and individual households). Second, housing reform and globalization together lead to an inflow of FDI to the housing market. Foreign capital, such as joint ventures, has created a demand for commercial properties (Wu, 2001) and caused housing prices to increase. Lastly, together with political reform, housing reform results in fundamental changes in local administration and urban planning policy (Keivani *et al.* 2001). In addition, housing reform has also introduced or exacerbated problems such as housing inequality and residential separation (Huang 2003).

Economic transition also causes the fiscal policies (interest rate, taxation, etc.) in transitional economies to be modified. Some scholars, such as Berry *et al.* (2001), have discussed the dynamics of the housing market caused by the transformation of fiscal policy. They claim that fiscal policy and taxation measures can be used on both the demand and supply side to stimulate or deflate markets (Adair *et al*. 1994, Berry *et al*. 2001). For example, on the supply side, tax concessions to private investors can promote the supply of affordable housing (Yates and Wood 1996); on the demand side, fiscal and monetary policy directly affect housing demand through changes in personal disposable

income, interest rates and the tax allowance on mortgage interest payments (Giussani and Hadjimatheou 1992). All these changes in supply or demand are reflected in housing prices.

Economic transitions such as deregulation, privatization, and price liberalization have set the preconditions for more profound restructuring in the transitional economies, namely integration into global capitalism (Sykora 1994). "A significant fraction of the foreign direct investment (FDI) … coming into the transition economies was generated by the different privatization programs initiated under central planning" (Siklos 2000, p.373-p.374). Consequently, transitional economies have gradually come under the influence of globalization. They no longer operate and develop in the closed system of a socialist command economy as they did before.

2.1.2 Globalization

Globalization means the cross-border functional integration of globally dispersed economic activities and growing interdependency among regional economic blocs (Dicken 1992, Lo and Marcotullio 2000). Functional integration is progressing through increased stretching (geographical widening) and intensity (deepening) of international linkages (Dicken 1992). The emergence of transnational corporations and banks, global consumption norms, world ideologies, and international authority structures (Ash 2002) accelerates the integration process which in turn, results in the expansion of international trade, financial flows (mainly in the form of FDI), communications (information and idea flows), personal and business travel and labor flow (Fu-chen and Peter 2000, Ash 2002), the formation of supra-national political organizations, and the spread of values and norms across the world (Marcuse and van Kempen 2000).

The influences of globalization on urban housing markets have been well documented. Urban property markets of both Keynesian capitalism and socialist command economies were usually subject to stringent local control. With the economic transition, local states had to adjust their regulatory regimes to embrace/enhance competitiveness and this paved the way for the increased influence of external investment in real estate development (Logan 1993, Wu 2001). Based on their observations of London's and New York's housing markets, Harloe *et al.* (1992) see globalization affecting housing markets in at least three ways. The first impact lies in the rippling price effect. The concentration of multinational financial institutions and other corporations leads directly to an increase in the small but significant demand for luxury housing and then results in inflated price levels for other housing. Similarly, Knox and Taylor (1995) think that the inflow of foreign capital stimulated unprecedented property booms and urban redevelopment in many cities, such as Seoul (Kim and Choe 1997, Short and Kim 1999), Sydney (Short and Kim 1999), and Toronto (Todd 1995). Siklos (2000) argues that FDI may cause an increase in domestic liquidity that can be inflationary, and thus lead to an increase in housing price levels. The second consequence claimed by Harloe *et al*. (1992) is that elite housing has become an increasingly attractive option for global investors. The third effect is the deregulation and globalization of home mortgage finance. Because of globalization, real estate prices in local markets have become sensitive to the climate of the international financial market (Sassen 1991). For example, the Asian financial crisis during 1997-1999 resulted in the collapse of urban housing prices in South East Asia (Fung and Forrest 2002). Another important effect of globalization includes the exclusion of moderately profitable firms and of residents from the city center, due to the

concentration of highly profitable TNCs there and the concomitant increase in real estate prices (Haila 2000).

External influences on local housing price are especially strong in world cities. In world cities, foreign companies usually build their offices in the central city. They are willing to pay an extremely high premium for a central location and have no interest in other locations (Sassen 1991). The competition for better places directly causes the housing price in city centers to increase. In addition, because of the presence of foreign companies in world cities, a dichotomized labor force also comes into being. On one side are the high-wage elite who are professionally specialized in control functions. On the other side are a great number of low-waged persons who are low-skilled workers engaged in manufacturing and low-end services. Despite representing a small proportion of urban residents, the high-income elite are the most important consumer group in world cities. This group is interested in and able to afford high-end housing. Its demand for luxury housing inevitably results in the high housing prices of world cities (Sassen 1991). As Sassen (1991) argued, the rapid growth of a high-price real estate market is a result of rapid growth in the number of financial firms, services firms, and high-income workers. However, it should be noted that although housing prices in world cities generally are increasing, there are market discontinuities. While housing in central-city locations is extremely expensive in world cities, in other portions of these cities, prices are much lower.

Most studies on globalization and urban housing markets address how foreign direct investment affects housing price (Harloe *et al.* 1992, Todd 1995, Kim and Choe 1997, Short and Kim 1999, 1999, Siklos 2000). This is not only because housing price is a

critical issue for households, investors and government, but also and more importantly because among all the influences of globalization on cities, the major one is foreign direct investment (FDI) (Harloe *et al.* 1992). Therefore, FDI, rather than globalization, is measured in this study.

The impacts of globalization have also been investigated in emerging economies, such as China. Wu (2001) groups the effects into three aspects. First, the emergence of joint ventures contributes to the formation and development of land and housing markets. The inflow of foreign capital stimulates property booms and urban redevelopment (Knox and Taylor 1995, Todd 1995, Kim and Choe 1997, Short and Kim 1999). Second, foreign investment helps to develop a dynamic market segment and form housing submarkets. Third, globalization influences the perception of what is 'fashionable' and worth pursuing. Foreign architecture styles of buildings are used by real estate developers as a selling point to attract customers who are looking for a new way of life. It is foreseeable that globalization, led by foreign investment and regulatory bodies, will increasingly influence cities' housing markets in transitional economies (Wu 2001). The intensity of its influence depends on the volume of foreign direct investment, which in most cases is measurable and therefore makes the quantitative research on globalization feasible.

2.1.3 Urban Transformation[2]

Economic transition is imprinted on urban form through urban transformation. In transitional economies, through various economic reforms (mainly through decentralization), local governments now make almost all the major decisions concerning local planning and development. Such decisions were made by central government before

[2] In this research, the concept of urban transformation not only refers to urban spatial restructuring (the reshaping of urban form), but also includes urban social restructuring.

the reforms. This change has resulted in new business districts, gentrified residential communities, new social areas, urban sprawl, large peripheral residential communities and development zones and sub-centers (Wu 1998, Gaubatz 1999, Wu and Yeh 1999). Urban social structure also altered with the economic transition. For example, as Nee (1989) and Bian and Logan (1996) argued, the transition from a planned to a market economy continues to contribute to income inequality in China.

Globalization also contributes to the new spatial order of cities. As Friedmann (1986) states, the physical form of cities can be explained with reference to a worldwide process that affects the direction and volume of transnational capital flows--- the spatial division of the functions of finance, management and production; and the employment structure of economic activities. For example, the rise of financial and producer services and the massive influx of mobile capital in large metropolises lead to the emergence of new financial districts and luxurious residential areas in developed economies (Short and Kim 1999). Scholars (Sassen 1991, Short and Kim 1999) argue that this expansion of global functions has been the major source of urban restructuring in world cities. Their reasoning is that foreign capital's selective investment causes local governments to reform/renovate cities to cater to foreign investment. For example, in Guangzhou, China, urban master plans were revised in the 1990s to make the city more internationalized and more attractive to foreign investors (Wu 2001). Moreover, globalization also leads to increasing social spatial differentiation or polarization (Sassen 1991). Hamnett and Cross (1998) claim that even if polarization is not occurring, increasing social inequality does occur in global cities.

Spatial restructuring has at least two effects on the urban housing market (Han 2000). First, the construction of new urban areas alters the locational characteristics of housing, like distance to the city center, and thereby changes housing price. Second, urban renovation creates new amenities, such as parks, open-space, theaters and museums. Since households compete to live in areas with amenities, they are willing to pay more for houses contiguous to amenities (Ball 1983).

Social restructuring influences the housing market as well. Social structure refers to the demographic structure, the income structure of the population, and the social spatial structure. A change in social structure may result in the adjustment of the housing market. For instance, since people of different ages or with diverse incomes have dissimilar preferences for housing, they may value the same type of houses differently. The elderly and those receiving high-incomes may be willing to pay for "good"[3] housing while youth and those receiving low-incomes may not. As a consequence, in a city with a substantial population of elderly and high-income people, the price of luxury housing is anticipated to be rather high because of strong demand. Moreover, the geographical distribution of households with different family structures or household incomes partially accounts for price differentiation over spatial submarkets.

2.2 Market players and rules

The housing market is conceptualized as a system which embodies a set of market players, and a set of formal and informal rules and conventions (Fung and Forrest 2002). In order to unravel the behavior of the urban housing market, including the formation of housing price and market segregation, it is necessary to know the market players and their interests, strategies and actions, and the market rules. Only after we have such

[3] Good housing refers to housing with high-quality structures and in favorable places.

information, can we examine the relationship between the players and rules, which is the key to understanding the behavior of the urban housing market (Parsa and Keivani 1999). In this section, I will first review the literature on market players, then on market rules.

In an urban housing market there are various groups of players who have a variety of motivations and vested interests and employ diverse tactics. These include speculators, developers, intermediary agencies, financial agencies, governments, architects, and building material providers (Healey and Barrett 1990, Wu 1999). Each player reacts in the market according to his or her perception to maximize housing-related benefits. Most activities in the urban housing market involve several players. For example, in order to convert rural land to residential use, at least five different actors must participate: a speculator, a developer, the state, a builder, and finally, a household. Therefore, although these players participate in the urban housing market with various motivations and methods, they are tightly interrelated.

Speculators participate in the market mainly through buying and banking land and buildings. Sometimes, they also renovate the banked properties for future gain. Speculation is sometimes considered to have positive effects by urban geographers. For example, speculative activities account at least partly for the revitalization of neighborhoods, through either private or public financed upgrading or gentrification (Pacione 2001). However, speculation does not always play a positive role. Speculation may contribute to the creation of slums, and the displacement and destruction of communities (Pacione 2001). Around the peripheries of cities, speculation is one of the reasons causing “leapfrogging”: speculators hold land for a future increase in the price

but leave it undeveloped; on the other hand, in order to avoid land held by speculators, builder-developers invest in even further-out suburban areas (Johnston 1976).

Another group of players, developers, are the producers of the urban housing market. Developers' decisions as to whether a development project is desirable depend on the market conditions, such as the supply and demand situations of properties and capital. Therefore, they are very sensitive to the market and active in producing or reproducing the built environment. The relationships between a developer and other players in the market could also be bounded by market conditions. For example, according to their perception of market conditions, developers acquire specific amounts of inputs such as technical expertise, material, capital, land or a regulatory environment from other players (Han and Wang 2003). Hence, the development of housing involves not only the decisions of the developers but also the decisions of other players (William 1983).

Various intermediary agents and state institutions affect the volume and direction of capital flows and other market activities, thus cannot be excluded from a study of urban housing market (Peter 1989). Intermediary agents such as banks, appraisers, insurance companies, advertising companies and real estate agents function to provide information, evaluation and mediate the relationship between the other players. The most important role of real estate agents is as a bridge between buyers and sellers of real estate. Real estate agents, together with other institutions such as financial institutions, usually actively assist with and facilitate property transfers because their revenues come from the fees charged on completed property transactions. In addition, real estate agents may also contribute to patterns of residential segregation (Pacione 2001). Through deliberate racial

and ethnic steering, they can influence the social composition of neighborhoods by directing people to particular housing areas (McNamara 1984, Teixeira 1995).

Financial institutions, such as banks and insurance companies, provide the capital for the housing market. The urban housing market is a place where capital is intensively concentrated. Both suppliers and consumers need money that they commonly do not own in full. Therefore, as the capital suppliers, financial institutions are indispensable for the urban housing market. As Harvey (1982, 1985) argues, various financial institutions provide paths of capital flow through which surplus generated in the primary sector is directed to the built-environment. However, since capital is always profit-oriented, and the opportunities of investment are differentiated over the urban area and individuals in that urban area, financial institutions adopt spatially and ethnically discriminating lending practices that have a significant impact on the urban landscape. It is much easier to get loans for advantageous places for development or renovation; majority populations can get mortgages easily while minority groups often can not. This kind of practice is usually referred to as red-lining (Pacione 2001, Rubenstein 2002).

The government is another critical actor in the urban housing market. Although the degree of their involvement varies across countries, the regulation of housing markets by the state is a universal phenomenon because of the spillover of externalities and the need for the provision of public goods (Yeh and Wu 1996). Common instruments include routinely overseeing the housing market, fiscal policies such as taxation, legal restriction of private rights to use urban land, authorizations of residential subdivisions, planning, zoning, the provision of urban infrastructure, and other related policies (Roweis and Scott 1981, Yeh and Wu 1996). It should be noted that the formation and implementation of the

policies involve many governmental agencies and actors who stand for various interests (Yeh and Wu 1996). Thus any government decision concerning the urban housing market can be seen as the result of the balance of power between the different actors and parts of the state and administrative apparatus (Alain 1987). Through regulation, government is able to "support the development process … moderate its adverse externalities, safeguard social needs and conserve resources and environmental heritage" (Healey and Barrett 1990, p.96). Government is not only the regulator of the market. It also participates in development activities by forming coalitions with public or private companies[4] (Keng 1996), especially for large scale projects that developers themselves may not be able to afford (Peter 1989). It is believed that the main objective of government in these coalitions is to foster urban development and revitalize local economies (McNamara 1984, Logan and Molotch 1987, Healey and Barrett 1990). Private firms usually welcome such coalitions so that their investment is secured. Lastly, the state works as a development intermediary or as a safeguard for particular interest groups (Healey and Barrett 1990).

Only recently, foreign investors including foreign speculators, developers and builders were recognized as influential market players in local housing markets. Various reasons account for overseas companies entering local markets, such as problems at home, and favorable policies and financial advantages (low interest rates, high rates of return) in destination countries (Healey and Barrett 1990). Because they commonly are not familiar with local markets, they participate in the market usually by working in partnership with local firms. It is thought that this partnership could maximize their possibility of success within local economies and local politics. The effects of foreign investors on the local housing market are many. They can reorient players' interests, strategies, working

[4] Such a coalition is called a growth coalition.

methods and relationships, challenge established relationships among players, and introduce new business perceptions (Healey and Barrett 1990). In transitional economies, foreign investment has been crucial in the rapid development and growth of the real estate markets (Parsa and Keivani 1999). Foreign investors provide not only housing supply but also demand, which is essential for rapid development of newly emerging housing markets. Also, they bring in advanced management and promotion skills that when learned by local real estate companies help to improve local companies' profit margins.

An important but often neglected group of players in the market are the households (Wu 1999, Wang and Murie 2000). In terms of supporting the fundamental structure of the urban housing market, households together with developers are the most important players in the market. Without households, the housing market would not exist. It is claimed that in the developing world a large proportion of the capital gains in property values that are associated with rapid urban growth is garnered by the high-income households whereas low-income groups especially suffer from the effects of crowding, lack of services, adverse policies and displacement from favored locations close to employment opportunities and social services (Linn 1983, William 1983).

Last but not least, major commercial and industrial enterprises are another group of market players. They participate in the market first because they must get prime sites for their commercial and industrial activities. Moreover, it is essential for them to assure that the urban housing is relatively cheap and available for the majority of urban residents since high-priced housing exerts upward pressure on wages, removing the competitive

edge that is the fundamental basis for much of commercial and industrial activity (William 1983).

In summary, the urban housing market involves the speculators, the construction industry, the building materials industry, the financial sector, households, and commercial and industry enterprises (Healey 1994). To mediate the relationship between these players, intermediaries have emerged. Moreover, the government enters into these processes in diverse ways, through regulations and policies, as a development intermediary itself, and in order to safeguard particular interests and values. Whatever the socioeconomic framework and the organization of real estate market the major players and their strategies combine to produce the specific characteristics and qualities of the urban housing market. These are then exploited by property developers, investors and other privileged player groups to create development opportunities and extract value (Healey 1994).

Housing market players have been intensively scrutinized by researchers. However, market structure has not received the same detailed examination. Market structure, as defined by Healey and Barrett (1990), is what drives the development process and produces distinctive patterns in particular periods. Specifically, it is the framework within which individual agents make their choices. The core aspects of structure include the various *resources* to which agents may have access, the *rules* which govern their behavior, not only in the form of legal documents and administrative decrees but also informal rules in the form of custom and culture (Han and Wang 2003), and the *ideas* which they draw upon in developing their strategies. Market structure is established by

the way agents operate: deploying, acknowledging, challenging and potentially transforming resources, rules and ideas as they frame and pursue their own strategies.

The relationship between market players is reciprocal. On one hand, market structure sets up the framework within which market players act to maximize their benefits. In this way, market structure is reflected in market players' routine activities, such as developing and pursuing their strategies. On the other hand, market structure is affected by the way individual agents determine their strategies and conduct their relationships as they deal with specific projects and issues, and as they consider their future stream of activities (Healey and Barrett 1990).

2.3 Housing Market

2.3.1. Housing price

The price or value of any product is derived from the utility that consumers gain from consuming the product, more specifically, from consuming the features of the product. A housing unit is best perceived as a product that is a bundle of features which contribute to the provision of a flow of one or more housing services (Watkins 1999). Accordingly, housing price is determined by the housing features, including not only the physical structure of the residential building itself, but also the accessibility of the lot on which the building stands and the services provided to the lot such as water and energy supply, transportation, waste disposal, drainage, and fire and police protection (Linn 1983). All these features fall in one of the three categories - structural characteristics, locational characteristics and other characteristics (Olmo 1995). The classification of housing features has long been established and verified by many researches, even though

the specific attributes used in various studies are different. A summarization of the housing characteristics used in selected literature is available in Table 2-2.

Table 2-2: Housing characteristics used to explain housing price

	structural attributes	**locational attributes**	**others**
Olmo (1995)	Apartment age, numbers of bathrooms, constructed square meters/ the number of rooms, floor of building	Cartesian co-ordinates	N/A
Orford (2000)	Floor area, dwelling type, number of bedrooms, number of reception rooms, number of bathrooms, number of separate shower rooms, central heating system, number of garages, parking, age, garden, modification	Distance to CBD, neighborhood's social class	Building purpose, ownership
Linn (1983)	Space, on-site service, shelter structure	Access	Tenure
Edelstein (1974)	Lot size, garage spaces, number of bathrooms, age	Distance to city center, property location	Sale date
Palm (1978)	Age, square footage	Minorities, education, career, population density, distance to CBD, air pollution, crime rates, tax rates	Tenure, household structure
Bajic (1985)	Floor area, outside lot area, numbers of bathrooms, garage places, and extras, construction material	Distances to transportation and CBD	N/A

The table illustrates that structural characteristics typically consist of housing size, floor of building, facilities/on-site services (heat, water, etc.) and, of course, housing structure such as the construction material and the arrangement of rooms. Structural characteristics convey direct benefits or disbenefits associated with the consumption of these characteristics. For this reason, intuitively, better structural characteristics lead to higher housing price.

On the other hand, locational characteristics are comprised of accessibility and neighborhood characteristics. In monocentric theory, accessibility is measured as the distance, cost or time (including congestion) to the central business district (CBD), along with the difficulties, costs or limitations that this entails (Olmo 1995). In multicentric theory, the distance/cost/time to sub-centers also matters. Accessibility of employment opportunities, of off-site services such as health and education facilities, and of community contacts is also important because it permits households the opportunity of earning incomes and of benefiting from social services (Linn 1983). Therefore properties with better accessibility can claim higher prices. Similarly, favorable neighborhood characteristics may result in higher housing prices. People are willing to pay more for the social prestige of living in a certain area (Lanegran and Palm 1978) because on one hand people are willing to pay more for living close to those who share the same cultural and social backgrounds, and on the other hand, housing is frequently used as a status symbol. Neighborhood characteristics can be represented by household income, gross rent, percentage of professional jobs held by residents (Heikkila *et al.* 1989), crime rate (Smith 1978, Diamond 1980), environmental quality (Smith 1978, Diamond 1980, Nelson 1993, Rosenthal and Helsley 1994, McDonald and McMillen 1998) and traffic congestion (Nelson 1993). Obviously, the locational characteristics of a housing unit do not always remain the same. And thus the price of a particular housing unit may be affected by the changes of the transport system, by changes in the location of employment opportunities and social service facilities, and by changes in the cultural and social balance of the community (Linn 1983).

2.3.2. Housing submarket:

Urban housing researchers have long debated the existence and significance of housing submarkets (Whitehead 1999). Two questions underlie the debate on this topic: first, what is the appropriate level of aggregation for the study of housing, i.e. should the urban housing market be divided or just be seen as a whole? Second, if the metropolitan housing market is to be subdivided, what is the best means of delimiting submarkets (Palm 1978)? Most scholars now agree that the urban housing market operates as a series of linked, quasi-independent submarkets (Maclennan 1982, Orford 2000). In practice, this view has generally been adopted as an assumption for housing market research when submarkets are carefully defined to bound areas which are likely to show discrete attribute price structures (Palm 1978).

The existence of housing submarkets is supported by market reality. This can be illustrated by examining how housing bundles are bought and sold (Orford 2000). On one hand, the consumers of housing can be partitioned into distinct 'consumer groups' on the basis of households' housing preferences and tastes, income, stage in the life cycle, lifestyle, size and composition, and socioeconomic status (Kirby 1976, Maclennan 1992, Feitelson 1993, Kauko 2001). Even in the same 'consumer group', the housing choices of households are also likely to be constrained by search and information costs. In other words, people may demand particular locations and/or particular types of housing at particular locations (Goodman and Thibodeau 1998). On the other hand, housing stock can also be subdivided into distinct 'product groups' (Maclennan *et al.* 1987, Watkins 2001) on the basis of building, location, area density or internal attributes (Grigsby *et al.* 1987, Bourassa *et al.* 1997, Laakso 1997, Kauko 2001). A house occupies a unique

location in space and its locational attributes may be impossible to duplicate (Case and Mayer, 1996), which leads to the inelasticity of housing supply, even over long periods of time. The inelasticity of housing supply is compounded by the durability of the housing stock which is difficult to modify (Orford 2000). Segmented and sometime inelastic demand is matched to the differentiated and inelastic housing supply, which gives rise to housing submarkets, thus differential prices are paid for given attributes in different market segments (Watkins 1999, 2001). The segmentation of housing submarkets is more obvious in larger urban areas because the heterogeneity of housing demand and the inelasticity of housing supply are exaggerated in large cities due to their large, heterogeneous populations (Orford 2000).

The segmentation of a housing market is also determined by the separation of the land market. A relative unchanging supply of land over long periods makes a parcel of land almost unique, a characteristic which is amplified by its fixed location. The characteristics of a fixed and immovable supply are particularly important for urban land, since the demand for a piece of land in a growing city cannot be met with the relative surplus of supply elsewhere, which means that the land market in effect comprises a large number of separate markets. In the urban context, these are spatially discrete (Johnston 1976).

Moreover, segmentation is the result of institutional barriers and can be significantly influenced by the actions of gatekeepers such as land-owners, developers, estate agents, housing managers and financial institutions whose motivation and behavior largely structure the supply of housing bundles (Knox 1995). This is particularly important with respect to housing segmentation caused by racial discrimination (Orford 2000).

In practice, housing submarkets exists where the interaction between segmented demand and segmented supply generate price differences for some hypothetical standardized dwelling. Specifically, a submarket is deemed to exist if: *1)* the 'law of one price'[5] exists within the submarkets; *2)* a hypothetical, standardized housing unit trades at different prices in different submarkets (Watkins 2001).

Although it is beyond dispute that housing submarkets usually exist, the studies of housing submarkets are still few in number and submarkets have not been fully embraced in applied research (Watkins 2001). Most models of the housing market are still estimated on the assumption of a single market (Goodman and Thibodeau 1998). This situation is partly due to the convenience associated with the single market assumption, and partly because of the two major difficulties of submarket theory itself. The first problem is that a coherent definition of a housing submarket does not exist (Tu 1997, Watkins 2001). For example, some researchers have defined submarkets as consisting of all dwellings within a specific geographical area (Straszheim 1975, Johnston 1976, Palm 1978). Their argument is housing is not spatially substitutable because it is immovable. On the other hand, some scholars have suggested that submarkets comprise all dwellings which possess similar physical characteristics and are relatively close substitutes for one another, but relatively poor substitutes for dwellings in other submarkets (Grigsby 1963, Dale-Johnson 1982, Grigsby *et al.* 1987). Lastly, others may think that the urban housing market should be subdivided by the different tenure types associated with housing units (David and Lisa 1978). The second difficulty lies in that even if researchers agree on a definition, there is no consensus as to how submarkets should be identified. In practice,

[5] Within a submarket, all dwellings are considered relatively close substitutes by would-be buyers (Watkins 1999). Therefore, only one set of implicit prices of housing characteristics exists in a submarket. This is the 'law of one price'.

submarket specification has typically been performed on an *ad hoc* basis (Goodman and Thibodeau 1998, Bourassa *et al.* 1999). Some use census boundaries (Ball and Kirwan 1977); some prefer aggregated contiguous postcodes (Watkins 2001); some survey real estate agents (Michaels and Smith 1990); and others employ aggregated census tracts on the basis of racial composition (Straszheim 1974). A significant difficulty with the *ad hoc* procedure for defining submarkets is that there is no reason to be confident that the resulting submarkets are defined in an optimal or even satisfactory way. In other words, it is not clear that the *ad hoc* methods produce groupings of dwellings that have a maximum degree of internal homogeneity and external heterogeneity (Bourassa *et al.* 1999).

Besides the above restrictions, other inconsistencies[6] also have prevented the development of a coherent analytical approach to submarket analysis and thus the use of submarkets as an analytical framework for housing studies. Hence, it seems that in order to develop a general definition and methodology for submarkets, more empirical studies need be conducted and more submarkets in different cities need to be investigated. Only after we possess enough knowledge on the submarkets in different cities and during different time periods, can we possibly develop a more generalized and universally applicable submarket theory.

2.4 Hypotheses

In this research, I will test the following hypotheses:

1) Foreign direct investment and economic transition have introduced more market players and caused a change in market structure. Market rather than government plays an increasingly important role in the housing market.

[6] For example, the empirical analyses have employed differing tests, and case studies have focused on a range of different cities and different time periods (Watkins 2001).

2) The hedonic model adequately captures the Shanghai market. On one hand, since the market now becomes more influential, the hedonic model should work. On the other hand, the specificity of players and structures in China's urban housing market tends to make the model not work. In particular, the model works better in the more capitalist sectors/submarkets than it does in the more traditional sectors.

3) There are significant differences across submarkets within the overall Shanghai housing market. This can be observed from the significant differences existing across submarkets in hedonic model form.

Chapter 3 Methodology

3.1. Research site

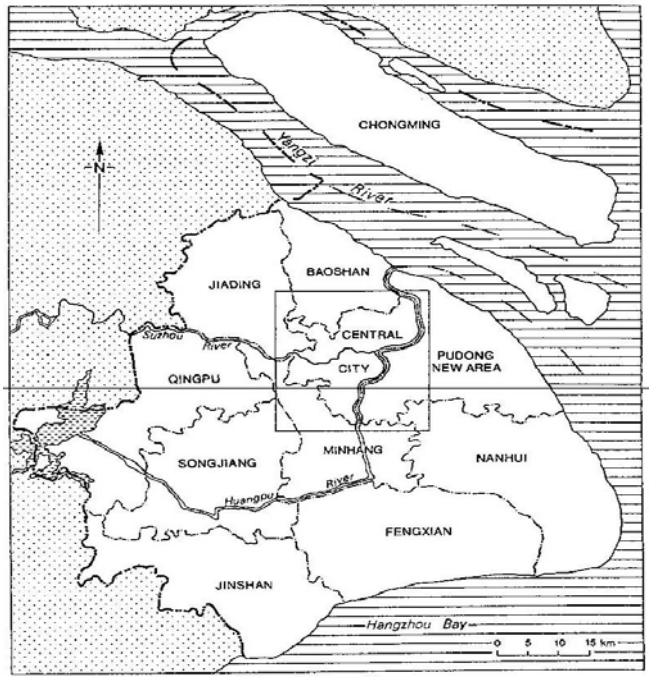
Shanghai, situated in Eastern China, is the 'crucible of modern China' (Yusuf and Wu 2002). Shanghai entered the stage of modern commercial and industrial development in the second half of the 19th century (Wei 1987). Ranked as the 7th largest city in the world in 1936, no modern Asian city from that period could match Shanghai's international reputation (Yeung 1996). Since the People's Republic of China was founded in 1949, Shanghai has served as a 'cash cow', providing revenue for the central government (Ho and Tsui, 1996). It has played and will continue to play a critical role in China's modernization and development (Han 2000). In 1990, Shanghai was designated the largest open city in China. With the opening of Pudong, Shanghai is expected to assume the leading role for economic growth in the Yangtze River basin (Han 2000). Now, with a population of over 15 million and an area of 6341 km^2, Shanghai is the largest city and the economic center of China. The metropolitan area consists of 19 urban districts, 9 of which are located in the central city (Figure 3-1), and 10 suburban counties (Figure 3-2) (Yusuf and Wu 2002).

Shanghai is a planned and sanctioned experiment with capitalism in China. The experiment began in 1990 when the central government announced the development of Pudong New Area. Since then, Shanghai's economy has shown remarkable expansion. Today, with a gross domestic product (GDP) of US$75.3[7] billion, Shanghai is responsible for 5.36 percent of national industrial output and contributes a significant proportion (as of 2001, 3.72%) of central state revenue. The almost exponential rate of economic

[7] In the study, the exchange rate of 1:8.3 between US dollars and RMB is adopted.

Figure 3-1: The ten urban districts of central Shanghai (Yeung 1996)

Figure 3-2: The administrative sub-divisions of Shanghai Municipality (Yeung 1996)



growth in Shanghai is the product of deliberate and organized national and local state policy decisions and institutional innovations (Safier 2001) that correspond to China's transition from a planned to a market economy.

One more impetus to Shanghai's development is its integration into the world economy. From the 1980s to 2001, the total contract value of FDI in Shanghai was US $104.88 billion and realized FDI was US $57.52 billion. The total value of foreign trade increased from US $2.89 billion in 1978 to US$112.4 billion in 2003 (NBSC 2004). The landscape also shows the tremendous and pervasive impact of foreign investment (Wu 2003). For example, advertisements for commercial goods of transnational corporations (TNCs), such as Coca-Cola, Samsung, Siemens, Sony, Panasonic, Pepsi, 7Up, Visa, McDonalds and Kentucky Fried Chicken, are quickly becoming the dominant "symbols" of modern Shanghai (Rosen 1997). Shanghai therefore is a good place to observe the impact of FDI as it is quickly becoming the most globalized city in China (Wu 2001).

Corresponding to the rapid economic development and recent population influx, Shanghai is undergoing a significant urban transformation. Among the instances of this reconfiguration, the process of spatial expansion across the Huangpu River into the 'new city' of Pudong (the eastern side of the Huangpu River) is the most remarkable (Safier 2001). In the larger and more built-up area of Puxi (the western side of the Huangpu River), the pre-existing urban area is also undergoing intensification and regeneration. Moreover, new infrastructure projects, such as elevated expressways and bridges, are quickly transforming the city's accessibility and creating new development spaces (Wu 2000). Furthermore, tremendous changes in social structure, especially population structure, are also observed in Shanghai, because the city is becoming the seed bed of a

new middle-class society and a magnet for tens of thousands of migrants seeking opportunities in its frenetic construction sector and looking for employment in its fast-growing manufacturing and services sectors (Safier 2001).

Owing to its integration into the world economy, its unparalleled economic status in China and its significant change in spatial and social structure, Shanghai is an appropriate "window" through which the influences of economic transition, FDI and urban transformation on urban housing markets can be examined. Moreover, examining what is happening in China could help people to better understand contemporary China. As Pye (1981, p. xi) said, "*Serious analysis of nearly all of the important aspects of life in China must, eventually, confront Shanghai and its special place in the Chinese scheme of things.*" There is no other city in China more suitable than Shanghai to conduct this research.

3.2. Methodology

3.2.1 Investigation of Players and Structure of Shanghai's Housing Market

Several methods have been developed to examine the roles of actors or institutions in the urban housing market. Each uses some form of actor-based or institutional frame of analysis. In their 1990's paper, Healey and Barrett (1990) provided an excellent critique of previous methods. They assert these methods have failed to adequately address existing conditions in the housing market and they suggest a new approach for urban housing studies.

In their approach, a housing market includes market players, the nexus of relationships between players, supporting legal arrangements, resources, rules, and ideology, i.e. market players and market structure (Healey and Barrett 1990, Healey

1992). Han and Wang (2003) categorized the components of housing market structure into three groups: 1) material resources referring to the primary ingredients of the production process--- land rights, labor, finance, information and expertise, 2) institutional rules that govern how resources are used and set by the institution or the political process, and 3) organizing ideas that influence the dynamics of resource use and rule formulation in shaping the development process. A fundamental dimension of the urban housing market is the interaction between market players' behaviors and the broader processes or structures that drive these players' strategies and interests (Wilson and Huff 1994). Structure both affects and is changed by the behavior of players in the housing market, while players in turn act within the opportunities and constraints provided by the structure of the housing market (Healey 1998, Healey and Barrett 1990). In this research, I will use this approach to analyze the actors in the urban housing market, including their behaviors, the interactions among them and their contributions to urban housing market.

A key issue in this task is the relationship between the strategies, interests and actions of the various players involved in the development process and the structure that frames the players' decision-making (Healey and Barrett 1990). The relationship may be observed through the way in which players define and implement their strategies in relation to the rules they acknowledge, the resources they use and seek to accumulate, and the ideas and ideology they have in determining and justifying their strategies (Healey and Barrett 1990). More specifically, Healey and Barrett (1990) proposed a research scheme for examining the structure and players of the urban housing market.

The first component of the scheme is the review of the forms of capital flow into and out of the built environment. It requires an understanding of the diverse sources of capital, the different ways capital can be invested in property, and the place of property in the various investment strategies. The review should focus on the interrelationships between types of capital, types of firm and types of investment strategy, and on the implications of the ways in which firms value land, property and location.

The second component focuses on the composition and strategies of the various firms in the urban housing market, including the strategies of firms and the consequences of the strategies, the relations between firms and market management agencies, and the appearance of new firms and the opportunities they exploit. The emphasis of this component is how the strategies constitute the firms' interests in land, property and property redevelopment, and how these interests reflect the negotiative practices through which action is undertaken. The objective of this component would be to provide a basis for analyzing the impact of such strategies on the urban housing market.

The third part examines the various ways in which the state impinges on firms' strategies, including the tools of intervention employed, such as financial subsidy, taxation and land dealing, the way in which intervention affects the demand for space, the rules within which individual firms develop their strategies, and the forms of development processes. The last component assesses the implications of the above processes for the urban housing market in terms of the impact on urban form, land and property values, the resultant social and economic externality costs and benefits within local economies and the distribution of these.

Accordingly, the structure and player analysis starts with an examination of structure because politico-juridical rules, and ideas and ideology, convey structural limitations and possibilities into the strategies and relationships of market players (Healey and Barrett 1990). The way to address this task is to combine the insights derived from the traditions of institutional analysis, and in particular the studies of implementation processes within the field of policy analysis, with the neo-classical analyses of the operation of urban land markets and Marxist approaches on the way capital flows through the built environment (Healey and Barrett 1990). Put another way, the analytical task is to link the institutional analysis of the housing market with the dynamics of the economy as reflected in resource flows, such as capital inputs, and with political organization and cultural values as reflected in rules and ideas (Healey and Barrett 1990). Giving an understanding of structure, the investigation of market players can be carried out. The critical task for this part of investigation is to answer five important questions: What? Who? Why? How? and Where? (Xie *et al*. 2002, Han and Wang 2003)? Specifically:

- What does happen in the urban housing market?
- Who are the major market players?
- What are their roles and power relations?
- Why do they behave as they usually do?
- How do individual actors determine their strategies and their relationships in the market, and how do their behaviors affect the market structure? For example, how do government and developers behave in the property development process to achieve their own goals? And finally,
- Where do their activities and their interactions with other players happen?

A critical practical problem associated with the method is how to gather information required for a theoretical analysis. The information needed for the analysis includes laws, regulations, and more important, descriptive information about how market players adapt to market structure, how they take advantage of the structure and how they avoid the negative influences, what their efforts are to change the structure, and how the structure is changed due to the pressure from market players, etc.

In general, laws, regulations and other documents are readily available. However, it is usually hard to gather the necessary descriptive information about market players. The best way to acquire this information is through interview or questionnaire. However, in many cases, interviewees are not cooperative with the interviewer, especially when the questions touch upon their business or personal affairs. For example, developers are not willing to answer questions such as "what is your strategy to maximize revenues under current market conditions?" Similarly, households usually avoid questions like "what is your household income?" Therefore, a nondirective interview, also called a semi-structured interview, is usually adopted if these kinds of questions are necessary for research. "Nondirective interviews are conducted with a fairly open framework which allows for focused, conversational, two-way communication. They can be used both to give and receive information" (Case *et al.* 1990[8]). In a nondirective interview, "the interviewee, by decision of the interviewer, controls the purpose, subject matter to be discussed, and pacing of the interview" (Stewart and Cash 1982, p15). The most prominent advantage of a nondirective interview is that it provides the interviewers great flexibility. Interviewees therefore are relaxed and they become less defensive.

[8] Link: http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/x5307e/x5307e08.htm

Even though a nondirective interview has these benefits, it is not universally applicable because it requires acute psychological insight and personal sensitivity of the interviewer. Otherwise, the interview will be fruitless. A combination of directive and nondirective approaches is therefore typically used. An interviewer may use the directive approach for easy to answer questions and use the nondirective approach for questions related to secrets or just for relaxing the interviewees.

Another method used to make interviews fruitful is snow-ball sampling which means interviewing individuals in a reference system. The reference system starts from an individual the interviewer is familiar with and then from him, the system expands to more interviewees that the initial interviewee recommends. New interviewees may then recommend more potential interviewees. Therefore, the system is like a snow ball becoming bigger and bigger. This method is very useful because it provides a very effective and necessary introduction to otherwise very busy and hard to contact persons (Walcott 1995, p29). Also, because the interviewer has been recommended to the interviewee by a mutual acquaintance, interviewees are more willing to tell the interviewer what he/she wants to know.

The focus group concept provides a useful complement to interviews (Keivani *et al.* 2001). The merits of focus groups according to Kitzinger and Barbour (1999) include the exploring of experiences, opinions and concerns, thereby enabling different perspectives to be investigated. It is recognized that the interaction between focus group members often produces insights and a dynamic not readily obtained through individual structured interviews (Stewart and Shamdasani 1990). Although focus groups also have acknowledged limitations, the approach has the distinct merit of permitting a wider

exploration of issues and is becoming a more popular tool in property research (Adair *et al.*, 1998, 2000).

In addition, an internal measure of control could be introduced in the interviews and focus groups by subjecting the different categories of interviewees such as developers and households to similar questions (Keivani *et al.* 2001). A final measure of internal control is validating findings from different stages of the research—namely, interviews, focus groups and literature review—against each other.

My analysis starts with the examination of the market structure, specifically, market rules (or government policies). This is because China's housing market is a policy-driven market. New policies not only induce new players into the market but also cause a change of roles in existing players and the relationships among them. For this reason, the investigation of market players is based on the full understanding of market rules. The research identifies the rules that have had significant impacts on the housing market, and then examines the effects of these rules on market players. The examination of the effects concentrates on how market players adapt to the new market environment and maximize their profits in the new condition.

In order to identify the market players, their roles and their strategies, I first describe what happened in the urban housing market, especially in the development process. Secondly, I identify the agencies involved in the process---their roles and power relations. Thirdly, I analyze the strategies and interests of significant actors and relate these back to market structure. This last step is important because market players have feedback effects on the market structure. For example, the adjustment of government policies is sometimes driven by market players - market players and market structure interact.

In the field investigation[9], I used 'snowball sampling.' Before I went to Shanghai, I gathered a list of potential interviewees. Initially, the list was a short one. But after I contacted several Chinese friends, the list grew. Among the persons on the initial list, some are my friends or the friends of them, and some others were selected because their names are often shown in newspapers and on the Internet. My former classmates who are studying in the University of Southampton, U.K. also contributed their contact lists. We can call all the persons on the initial list 'seeds', because later from them, I got contact information of other interviewees who were interviewed by telephone. All the interviewees were grouped into 6 groups: government, households, real estate agents, real estate developers, banks and academia (Table 3-1). Among them, I gave special weight to academic scholars because they are consulted by government, developers, banks and real estate agents. As a result, they know the thoughts of these players better than any other groups. Moreover, households are also influenced by the academy's views on the market published in the media. Therefore, they are not only knowledgeable about the housing market but also influence this market. In addition, since they are an independent group, they can provide unprejudiced views. After compiling the list, I designed several questionnaires. Different groups were given different questionnaires. Although the specific questions on different questionnaires are slightly different, the questions are centered on the roles of each player in the housing market and their interaction with other players within the market structure, such as what are the important players in Shanghai's housing market; please identify the influences of other players on your part, etc. The questions for academia are more general and comprehensive, for example, how the role

[9] All the investigations follow the requirements of Indiana University Bloomington Campus Committee for the Protection of Human Subjects.

of government has changed since the late 1980s, what factors have driven this change, what policies are important for the development of Shanghai's housing market, etc.

Table 3-1 The major persons in the survey

Name	Institutions	Representing
Ning Zhu	Eastern China Regional Center of VanKe Real Estate Group	Developers
Jingsong Wang	Department of Strategic Planning, Goldenfield Development Co. Ltd	Developers
Steve Clarke	Freesia Development Ltd.	Foreign investor
Jun Hu	Jian'an Planning Bureau	Government
Yongdong Zhang	Department of City Development of Shanghai	Government
Dezhong Wang	Research Lab of Shanghai Municipality	Government
Xiaojian Lu	Finance News of Shanghai (Newspaper)	Public Media
Jing Liu	ZhongNan Property Consulting Inc.	Real Estate Agents
Xin Qian	Self-employed in real estate business	Real Estate Intermediary
Zhi Su	Department of Real Estate Loan, China Industry and Commerce Bank (Sichuan Branch)	Banks
Li Qian	Law Department, Huaxia Bank	Banks
Zanhai Li	3rd village of Eastern China Normal University (ECNU)	Households
Facheng Zuo	JiaFu Residential Community	Households
Yun Cheng	JiaFu Residential Community	Households
Ji Li	Tianyuan Residential Community	Households
Lili Zhao	Jingfu Residential Community	Households
Yongyue Zhang	(Dean) College of Orient Real Estate, ECNU	Academia
Bogeng Chen	(Professor) College of Orient Real Estate, ECNU	Academia
Xiaodong Song	(Professor) Department of Planning, Tongji University	Academia
Shiwen Sun	(Associate Professor) Department of Planning, Tongji University	Academia
Yueming Ning	(Professor) Department of Geography, ECNU	Academia
Hongming Zhang	(Professor) the Center for Real Estate Research, Shanghai Academy of Social Sciences (SASS)	Academia
Xuejin Zuo	(Professor) the Economics Institute, SASS	Academia

The results of the interviews are better than I expected. When the interviewees filled out the questionnaires, they did not just fill in the blanks. Usually, they also told me stories beyond the questionnaire. These outside stories were very informative and thought provoking. Once no more new information emerges from the interview of a group, the interviews with this group end.

As a complement for gathering information, I also designed a few focus groups which included a mix of actors with differing backgrounds and perspectives on the urban housing market, such as public urban policy-makers, private real estate actors and financial institutions, households, and foreign investors. Each focus group was centered on four main themes:

- The rationale for investment in Shanghai's housing markets;
- Factors influencing housing investment and housing prices;
- Policy mechanisms and institutional perspectives including the role of planning; and
- The benefits or losses from the urban reform.

I also gathered information, especially information on government policies, from publications, such as Shanghai Real Estate Market, yearly published books, and the website http://www.realestate.cei.gov.cn, which is a professional real estate website, providing macro data of China's real estate market and real estate-related laws and regulations.

3.2.2. Hedonic Model

Hedonic models are based on the realization that some goods or factors of production are not homogeneous and can differ in numerous characteristics or attributes (Palmquist

1991, Lipscomb 2003). Consumers purchase different bundles of characteristics, i.e. different goods, each time a buying decision is made. Goods are valued for their characteristics in a hedonic model. The hedonic prices, defined as the implicit prices of attributes, are revealed from observed prices of differentiated goods and the specific amounts of characteristics associated with them (Rosen 1974).

Hedonic models have been used for a variety of purposes (Bourassa *et al.* 1999) and empirical research using the method of hedonic pricing has been a common feature in the literature of housing market research or urban studies since the 1970s (Olmo 1995, Orford 2000). The range of applications includes estimation of the influence on housing price of housing and neighborhood attributes such as land use, nonresidential activity, residential quality and accessibility, new residential construction and neighborhood disinvestment, and various externalities in the local surrounding environment (Bowen *et al.* 2001). All of these applications of the hedonic price function are rooted in Lancaster's (1966) new consumer behavior theory. In this framework, housing is a multidimensional good differentiated into a bundle of attributes that vary in both quantity and quality. Accordingly, the hedonic model links housing price to measures of attributes of houses (Can 1990).

Based on the assumption that housing can be regarded as the composite of a number of key characteristics, researchers may regress housing price on the quantities or availability of characteristics associated with housing stocks (Can 1990, Straszheim 1974, Bourassa *et al.* 1999). The estimated coefficients provide hedonic prices of characteristics considered (Can 1990). Evans (1995) considers this to be analogous to shopping in a supermarket which does not price individual items and where people are simply told the

total price to be paid for their basket of goods. If each shopper is asked to list what they have bought and how much they have paid, given that a sufficient number of shoppers is asked, the price of individual items can be found by solving a set of simultaneous equations. Ideally, a hedonic model should include the full set of all significant determinants of housing unit price as independent variables. However, this is usually not feasible, so judgment and experience with real estate markets are used to augment the theory (Bowen *et al.* 2001). In most empirical research, the housing attributes, a subset of the many characteristics which could be used to describe the housing bundle (Palm 1978), are grouped into locational and structural categories (Olmo 1995). The first relates to accessibility and neighborhood characteristics associated with the dwelling. This group usually includes variables pertaining to some general socioeconomics characteristics, accessibility, and the level of public services. The second group includes the structural characteristics of the dwelling, such as its style, its lot size, the number of rooms, and the structural integrity of the building (Can 1990). The estimated regression model is called a hedonic model. The coefficients in a hedonic model, also called the implicit prices/elasticities of considered attributes (Orford 2000, Straszheim 1974), provide a set of hedonic prices that are the result of the equilibration of demand and supply for housing attributes (Linneman 1980).

Hedonic regressions also can be used for testing if the posited submarkets are appropriately defined. This test procedure (Schnare and Struyk 1976, Palm 1978, Goodman and Thibodeau 1998) involves three stages. First, hedonic house price functions are estimated for the metropolitan area and each potential market segment in order to compare the market and submarket prices for a ‘standard’ dwelling. Second, a

Chow test or an F-test is computed to establish whether significant differences exist between the submarket specific prices, and between the submarket prices and the prices of the whole market. Third, a weighted standard error is calculated for the submarket model. This acts as a further 'common-sense' test of the significance of price differences for standard dwellings in different submarkets, and also allows us to compare the effect on the accuracy of the house price models when different submarket definitions and stratification schemes are compared (Watkins 2001). If the submarkets do exist, the strength and the direction of the coefficients of the whole market model and the submarket models should differ, and an F-test should show that the submarket models significantly reduce the squared error of the price change variable (Palm 1978). The problem with this procedure is that the submarkets are imposed rather than modeled. If submarkets impact housing prices, the factors that define the submarkets would be expected to affect the prices as well (Goodman and Thibodeau 1998).

In order to interpret the marginal implicit prices (the coefficients in the hedonic model) the hedonic model has to be based on the assumptions of a competitive and equilibrium market, and symmetric information between seller and buyer. The first assumption indicates that the housing prices and hedonic prices clear the market for a given stock of houses and attributes (Olmo 1995, Wilhelmsson 2000). This means, given both consumers and producers base their locational and quantity decisions on maximizing behavior, and buyers have the freedom of movement across space and time, the amount of houses offered by sellers at every place in the urban area must equal the amount demanded by consumers choosing to locate there (Rosen 1974, Atkinson and Crocker 1992). The second assumption implies each household is perfectly informed as to house

price, house attributes and other related market conditions, and transaction and moving costs are zero (Wilhelmsson 2000). We will see how these assumptions are satisfied in the last paragraph of this chapter.

Based on these assumptions, the classic specification of the hedonic regression model that has been used in the majority of hedonic research is (Can 1990):

$$Z = \alpha + \sum_{k=1}^{K} \beta_k S_k + \sum_{j=1}^{J} \delta_j L_j + \varepsilon \tag{3.1}$$

where Z is housing price, S_k are structural characteristics, L_j are locational characteristics, α, β and δ are regression model parameters, and ε is the disturbance term. The model is usually estimated by ordinary least-squares (OLS) techniques.

Sometimes polynomial models are employed (Halvorsen 1981). The general form of these models is:

$$Z = \alpha + \sum_{k=1}^{K} \beta_k S_k^{\lambda} + \sum_{j=1}^{J} \delta_j L_j^{\gamma} + \varepsilon \tag{3.2}$$

where λ and γ are positive integers and the other parameters and variables have the same definitions as in (3.1).

Other functional forms are also available (Goodman and Kawai 1986) but most are just transformations or modifications of these two forms. In practice, the independent variables (attributes) adopted by researchers vary with the purposes of their research but still fall into the three categories: structural attributes, locational attributes and others (Table 2-2). The choice of functional form is usually based mainly on the considerations of convenience in dealing with the problem at hand (Halvorsen 1981). However, there are still some guidelines to follow. As Orford (2000) advised, the form of the hedonic model should reflect the processes and structures implicit in local housing market dynamics,

which requires a more realistic treatment of the supply and demand of housing attributes, taking into account both the compositional nature of the housing stock and the contextual nature of urban space. Similarly, Feldstein (1982) and Bowen *et al.* (2001) suggest that a good model should conform to three criteria, parsimoniousness, plausibility, and informativeness. A model is deemed parsimonious if it contains the minimum number of attributes, plausible if its variables and the relations between them are justifiable, and informative if it provides situational guidance appropriate to the application at hand (Bowen *et al.* 2001).

The classic specifications have many limitations. First, they are based upon the assumption of a single housing market functioning in instantaneous equilibrium which indicates that the parameters of the model (the hedonic prices) are constant across urban space (Maclennean and Tu 1996, Olmo 1995). This view ignores the fact that the urban housing market is comprised of a set of submarkets, which can lead to disequilibrium in the supply and demand of housing (Goodman and Thibodeau 1998, Orford 2000, Straszheim 1974). A huge variation exists both in the types of housing available across spatial submarkets and in the demand for housing of a given type in any spatial submarket (Straszheim 1974). Therefore, hedonic models may be subject to aggregation bias because of the failure to account for submarkets in the hedonic specification (Straszheim 1975). Furthermore, this failure may lead to misleading inferences about the magnitude and significance of parameter estimates and it can also negatively affect the validity of a wide range of standard diagnostic tests (Anselin 1988). That is to say, that if the hedonic modeling is based on transaction data drawn from a variety of submarkets within the local housing market, then the estimates will not accurately reflect the relevant

attribute price in any of the submarkets. This means that the "average" attribute price estimated using the hedonic technique is distorted due to aggregation bias (Watkins 1999). Therefore, in order to improve the statistical reliability of the estimates, determine the influences of area-specific coefficients and predict housing prices, the model specification must capture sufficiently the structure of the local housing market (Straszheim 1974, Palm 1978, Goodman 1981, Orford 2000), i.e. the disaggregation or aggregation of the urban housing market. A good practical way is to conduct a multilevel study, which means the regression of housing price on housing attributes for each submarket (Orford 2000).

Moreover, ignoring the structures and processes associated with the housing market can have other consequences. In particular, hedonic models may suffer from heteroscedasticity and spatial autocorrelation that will violate the assumptions of independently identically distributed (IID) errors in OLS regression (Olmo 1995, Orford 2000). To avoid violating the assumptions, the specification must allow for housing bundles and housing submarkets (Orford 2000). In practice, generalized least squares (GLS) and iterative procedures or Kriging methods also can be used to improve hedonic models (Dubin 1992, Olmo 1995).

In order to avoid the limitations associated with the classic specification of the hedonic model, I will allow submarkets in my model (Orford 2000). Moreover, my model integrates the variables of economic transition, FDI and urban transformation to investigate the impacts of FDI, economic transition and urban transformation on housing price.

$$Z_{kj} = \alpha + \sum_{k=1}^{K} \beta_k S_k + \sum_{j=1}^{J} \delta_j L_j + \sum_{i=1}^{I} \gamma_i F_i + \sum_{m=1}^{M} \eta_m T_m + \sum_{n=1}^{N} \lambda_n U_n + \varepsilon \qquad (3.3)$$

In this model, S_k, L_j, α, β, δ and ε have the same definitions as their counterparts in the classical model (3.1). The dependent variable is a little bit different from the one of the classical model in that Z_{kj} represents the hedonic price of the representative house in the kj_{th} joint spatial structural submarket. Many new variables and coefficients are introduced in the model: F_i is distance to FDI-concentrated areas and distance to foreign companies; T_m are economic transition variables like property rights, the existence of which is the direct result of economic transition; U_n denote urban transformation variables such as distance to newly-built roads, distance to new open-spaces, distance to newly-built urban areas, and percentage of youth and elderly; and γ, η and λ are regression model parameters.

This specific model could be generalized as:

$$Z_n = f_n(c_{1n}, \ldots, c_{in})$$

where c_{in} refers to the ith component in the nth submarket. The model will be applied to the overall market and each submarket. By checking the significance (t-test) of coefficients, I can test the hypotheses on the effects of FDI, economic transition and urban transformation at both overall market and submarket levels. Moreover, investigating the model specifications, I can determine if the hedonic models are significantly different across submarkets.

3.2.3. Submarkets

There is still no consensus on methods to stratify the housing market. The information used to define the submarkets is predetermined by some prior view of what is important (Bourassa 1999). To date, three different stratification schemes have been developed. The first and earliest classification is based on spatial compartmentalization

that can be traced to Straszheim's study of San Francisco (Straszheim 1975). He subdivided the market into zones that comprise relatively homogenous households and dwellings. The second method is based on housing structure, i.e. housing's physical attributes. The last method recognizes the joint importance of spatial and structural characteristics (Watkins 2001) in that it combines both spatial characteristics and stock characteristics. All the three methods have been used in empirical studies (Table 3-2). In the following, more details about the three methods are described.

Table 3-2: Classification of submarket studies (revised from Watkins (2001))

Authors	Study Area	Study Date	Method
Strasheim (1975a)	San Francisco Bay, USA	1965	Spatial
Schnare and Struyk (1976)	Boston, USA	1971	Spatial, structural
Ball and Kirman (1977)	Bristol, UK	1970/1971	Spatial
Palm (1978)	San Francisco Bay, USA	1971 and 1978	Spatial
Sonstelie and Portney (1980)	San Mateo, USA	1969/1970	Spatial
Goodman (1981)	New Haven, USA	1967-1969	Joint
Dale-Johnson (1982)	Santa Clara, USA	1977	Structural
Gabriel (1984)	Beer Sheva, Israel	1982	Spatial
Bajic (1985)	Toronto, Canada	1978	Structural
Munro (1986)	Glasgow, UK	1983/1984	Spatial
Maclennan *et al.* (1987)	Glasgow, UK	1976 and 1985/1986	Spatial
Michaels and Smith (1990)	Boston, USA	1977-1981	Spatial
Rothenberg *et al.* (1991)	Des Moines, USA	1963 and 1971	Structural
Hancock (1991)	Tayside, UK	1977/1978-1986	Spatial
Allen *et al.* (1995)	Clemson, USA	1991	Structural
Adair *et al.* (1996)	Belfast, UK	1992	Joint
Maclennan and Tu (1996)	Glasgow, UK	1984 and 1990	Joint
Bourassa *et al.* (1999)	Sydney and Melbourne, Australia	1991	Spatial and joint

(a) Spatial submarkets

Spatial submarkets are comprised of relatively contiguous households and dwellings. Goodman (1981) claims that because demand and supply are spatially segmented, market segmentation by area seems appropriate. Several methods have been developed to identify spatial submarkets.

(a1) Census boundaries. This is the earliest published method for subdividing housing submarkets based on spatial location. The basic idea is stratifying neighborhoods based on the characteristics derived from the census (Straszheim 1975, Schnare and Struyk 1976, Ball and Kirwan 1977). *(a2)* Administrative boundaries. Straszheim, Sonstelie and Portney (1980) use a city's government administrative boundaries to stratify the urban housing market. *(a3)* Postcodes. The idea of this method is to pool houses from the same postcode (Hancock and Maclennan 1989). *(a4)* Principal components analysis and cluster analysis. Maclennan *et al.* (1987) use a principal components analysis to group neighborhoods with similar dwelling stocks and socioeconomic characteristics. Similarly, Bourassa *et al.* (1999) use a principal components analysis to identify the important characteristics of local government districts. Then cluster analysis is used to determine the most appropriate groupings of districts. *(a5)* Information flows. As Bourne and Simmons (1978) point out, a major weakness in most attempts to delimit submarkets is the failure to take into account the ways in which households search for housing (Palm 1978). Therefore, some researchers have attempted to segment the market on the basis of information flows. For instance, Palm (1978) divides San Francisco on the basis of districts within which real estate agents exchange information on vacancies. However,

despite the intuitive appeal of this approach, there were difficulties in establishing a consensus (Watkins 2001).

(b) Structural submarkets

An alternative to spatial segmentation bases submarkets on the characteristics of the housing structure. The ways employed include the following.

(b1) Floor area and lot size (Bajic 1985). Houses with similar floor area or lot size are aggregated to form a submarket. *(b2)* Dwelling type. Allen *et al.* (1995) divide housing markets by differentiating houses between condominiums, single-family homes, and apartments. Similarly, Orford (1999) bases his segmentation on distinguishing terraces, semi-detached, detached, purpose-built flats, flats in converted buildings, maisonettes and bungalows. The rationale of this method is that it is usual practice for real estate agents to describe each property by its dwelling type and that each of the dwelling types embodies a typical set of structural attributes (Orford 2000). *(b3)* Factor analysis of structural characteristics (Dale-Johnson 1982). Unlike the prior two approaches that are basically based on just one or a small number of variables, Dale-Johnson uses a wide variety of structural variables and employs *Q*-factor analysis to establish submarkets.

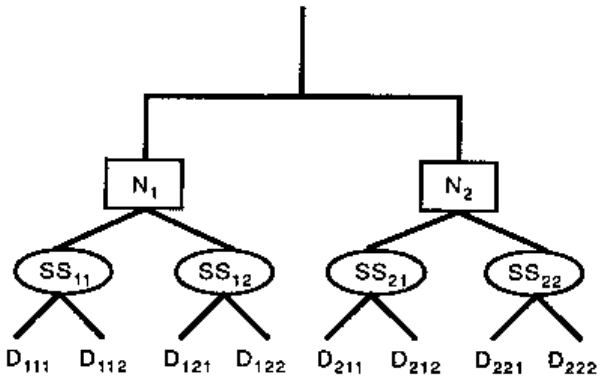
(c) Joint spatial/structure submarkets

The division of housing submarkets into spatial or structural is nonetheless problematic since the concept of housing bundles implies that locational and structural attributes may not be separable but may interact (Orford 2000). Especially in a large metropolitan area, it is unlikely that submarkets are based simply on one or two criteria (Palm 1978). As a result of this recognition, a more sophisticated submarket scheme,

joint spatial/structural submarkets, has been developed. The joint method matches the way people search for new homes. As Watkins (1999) argues, potential house buyers may focus their search for a new home on particular types of properties which are viewed as relatively close substitutes. In this case, potential buyers will extend their search to many geographical points in the market providing that the characteristics of the neighborhood in which the property is located are of equal quality.

Adair *et al.* (1996) used the simplest version of this approach in their research on the Belfast housing market. The submarkets were identified by subdividing the city into inner city, middle city, and outer city, and then by differentiated as terraced, semi-detached, and detached dwellings within each area. In a different way, Watkins (2001) first stratified the housing market into three spatial submarkets, namely individual properties, enumeration districts (ED), and communities, and then divided these spatial submarkets according to dwelling type. Figure 3-3 may be helpful for understanding the joint submarkets.

Figure 3-3 A nested local housing submarket structure (Tu 1997)
(N=spatial submarket, SS=Structural submarket, D=dwelling)



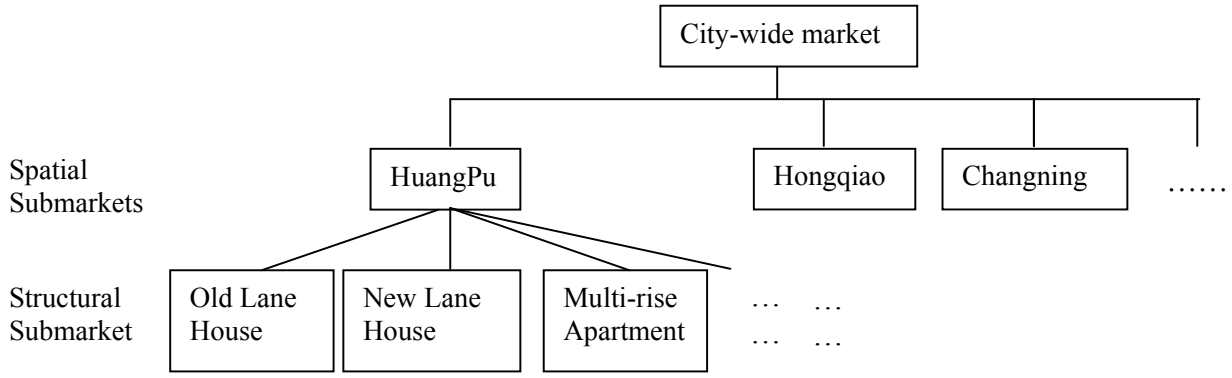
In the first level, spatial housing submarkets (N_1 and N_2) are distinguished. In the second level, the dwellings in each spatial housing submarket are grouped into structural

groups (for example, SS_{11}, SS_{12} in N_1) via their non-spatial dwelling components. The dwellings within each structural housing submarket (for example, dwellings D_{111} and D_{112} in SS_{11}) are only different in terms of non-key dwelling components (Tu 1997).

An ideal solution for submarket delimitation should possess the following three properties (Goodman 1981): *(1)* simplicity--- a solution with few submarkets is superior to a solution with many submarkets. *(2)* similarity--- the housing bundles within a submarket should be as similar as possible, thus yielding a high degree of homogeneity within submarkets. *(3)* compactness---contiguous submarkets of same type should be grouped together.

In my research, I used the method of nested locational/structural submarkets to stratify Shanghai's housing market (Figure 3-4). I subdivided the total housing market according to the administrative boundaries at first for convenience. This process generated ten spatial submarkets (ten central districts). Then, according to the building types, I defined old lane house, new lane house, multi-rise apartment, high-rise apartment, and garden house submarkets within each spatial submarket.

Figure 3-4 Submarket Scheme of Shanghai housing market



I also used Geographical Information System (GIS) to define locational/spatial submarkets. A GIS software bundle---ArcGIS has a function for spatial surface analysis. With this function, ArcGIS is able to generate a price surface for housing. This conveys both the location and price of housing in a single surface.

3.3. Data

In his paper about the British housing market, Bramley (1993) summarized the data needed for housing market research. These data fall into a number of categories:

(a) *Demographic data,* which measure the overall scale of the market, potential demand flows, and alternative supply flows. The data include age structure, household structure, etc.

(b) *Economic data,* indicators like GDP, employment/unemployment rate, earnings, foreign investment, asset investment, and other socioeconomic indicators. These economic variables play an important role in assessing housing demand.

(c) *Geographical variables*, such as neighborhood quality, distance from urban centers and amenities.

(d) *Planning policies and land supply* that can be obtained mainly from planning departments and/or land management departments. Planning policies and land supply are seen as the most important factors influencing housing supply.

(e) *Housing supply data*, including housing supply, tenure supply (the types of tenures), vacancies and so on, which can be acquired mainly from official documents.

(f) *Housing price* which is used to measure the demand and supply of housing.

These data can be acquired from various sources (Table 3-3). The data needed for my study also fall in these categories. Considering the purposes of my research and the availability of data, I identify six potential sources (Table 3-4).

Table 3-3 Data source of housing market research

Government	1. Unpublished government files, such as: city councils' valuation rolls, deeds registry, building permits (Rakodi 1994); property tax files, subdivision records, regularization 2. Published government documents, such as: statistic documents (Tse 1998, Wu 2001); property review (Tse 1998); property price index (Ong and Sing 2002)
Real estate agencies	Private appraisers; real estate and/or financial agents
Research institutes	Property Research International (Berry *et. al.* 2001)
Survey	Builders' and developers' records (Rakodi 1994); household survey (Rakodi 1994, Orford 2000, Li and Siu 2001)
Others	Computer simulations (Tu 1997); newspaper's advertisements (Rakodi 1994, Peter *et al*. 1994); internet: professional real estate websites

Table 3-4 Potential data sources of my research

Sources	Data	Specified sources
Published government documents	income, population and macroeconomic indicators	Shanghai Statistical Bureau: Yearbook (1990-2001) and its website, http://www.stats-sh.gov.cn/, http://www.realestate.cei.gov.cn
Unpublished government files	Housing price, land value, urban planning	Shanghai Real Estate Exchange Centre, Shanghai Housing and Land Bureau, Bureau of Urban Planning, http://www.realestate.cei.gov.cn
Newspaper advertisements	housing price, house's characteristics	XinMing Evening Paper, Shengjiang FuWu DaoBao
Real estate websites	housing price, house's characteristics	http://www.ehousee.com/; http://www.for-ease.com/; http://www.xinao.com.cn/; http://www.zhiheng.com.cn/; http://www.sakura-sh.com/; http://www.fangdi.com.cn/; http://www.sincere.com.cn/
Research institutes	housing price, electronic map	Eastern China Normal University, University of Southampton
Surveys	Information on structure and players	household, developers, real estate agents, government, intermediaries, banks, professors

Housing price data were collected only for a one-month period. The housing transaction data of a full time series (1988-2003) are not needed because the hedonic model by its nature is a cross sectional model rather than a time-series one. A short period best guarantees the market is in equilibrium and modeling a short period is sufficient to illustrate the effects of FDI, economic transition and urban transformation on housing price. Moreover, the transaction data is second-hand housing market data, thus it is more likely to reflect true market value.

Chapter 4 Shanghai's Housing Market

In this chapter, economic transition/reform, FDI, and urban transformation, and their influences on the urban housing market will be illustrated with reference to China and Shanghai. Chapter 5 contains a discussion of market structure and market players in the Shanghai housing market. Chapter 6 contains the results of the hedonic modeling.

4.1 China's Reform and Economic Transition

Since 1979, government power in China has been decentralized, a market economy has taken root and private enterprises have experienced rapid development. At the same time, China has emerged as a manufacturing powerhouse and cities have experienced large-scale rebuilding and restructuring (Mao 2004). Because the urban housing market came into being during this period of rapid change, an understanding of this transformation is critical for examining China's urban housing market. In general, two trends, i.e. from planned to market and from public to private, characterize the transformation.

4.1.1 From planned housing to housing market

Thousands of new regulations and policies have been put into place since the beginning of the reform. This research will not go over all of them. Instead, only the government reform, open door policies, and policies stimulating urban transformation will be introduced because they correspond with economic transition, FDI and urban transformation respectively.

1). Government reform

There are several aspects of China's government reform, including government organization, government functionality, and government power (Tang 2003, Mao 2004).

In terms of government organization, the reform aims at a smaller and more effective government; as for government functionality, government has been increasingly transformed to match the needs of a market economy; furthermore, government power has gradually decentralized from central government to local government and state-owned enterprises (Mao 2004).

The government reform was carried out in 5 year steps from 1982 to 2003 (Tang 2003, Mao 2004). The 1982 reform targeted downsizing the central government. The 1988 reform aimed at not only a smaller government but also fewer government interventions in the economy. In 1992, the Chinese government decided to establish a market economy. Accordingly, the 1993 government reform mainly dealt with how to transform the government functionally to achieve this goal. The 1998 reform is an extension of the 1993 reform. During this reform, several government departments were downsized because they were thought as serving a planned economy and thus were out of date. After the reform, more than 100 functions of central government were decentralized to local government and state-owned enterprises. Without further reducing the size of departments, the 2003 reform was characterized by reorganizing government departments and optimizing their functions. All these five reforms are centered on decentralizing power, downsizing the government and transforming government functions.

Several goals have been achieved through the five consecutive government reforms (Tang 2003, Mao 2004). First, government became smaller and more effective than before. Second, local government and state-owned enterprises gained more powers. Third, laws and government regulations, gradually replacing government officials' personal orders, are becoming the major ordinance that directs government activities. And fourth,

serving the market rather than regulating the market became the guideline for government behavior.

Through government reform, the old planned market structure was broken down. An emerging huge market and a more efficient and pro-market government helped China become a favorite investment destination of foreign capital. Economic development and the decentralization of power also provided local governments with more resources. All of these are the prerequisite conditions for the large-scale urban transformation in Chinese cities.

2). Open door policies

China decided to come back onto the world economic stage in 1978 when the 11st Conference of Chinese Communist Party determined to open China's door to the world. Since then, China has never stopped its steps toward wider openness. In terms of geographic extent, not only the coast provinces but also the inner provinces have been opened. In terms of investment sectors, elementary industries such as food processing as well as high tech industry and industries crucial for the national economy (such as infrastructure construction) have been opened to foreign investment (Kueh 1992, Chen et al. 1995, Sun 1998a, 1998b, Zhang 2002).

China's progress toward openness can be divided into three stages (Zhang 2002, Yang 2004). The first stage is from 1978 to 1992. In 1979, the first law addressing foreign investment, The Law of Sino-Foreign Joint Venture, was issued by the People's Congress of China. In the same year, the first foreign-domestic joint venture was set up. In 1980, Xiaoping Deng, the former Chief Secretary of Chinese Communist Party, first proposed the Open Door policy as one of China's base policies. Furthermore, in 1983, the

Chinese government relaxed previous restrictions on the investment sector for foreign capital. The second stage is from 1992 to 2001. At the beginning of 1992, Xiaoping Deng made a speech encouraging more daring reform steps during his tour to southern China (Jiang 1998). According to his speech, the 14th Conference of the Chinese Communist Party stipulated a series of open policies promoting the openness in more sectors and a wider geographic extent. The last stage began in 2001 when China was accepted by the WTO as a member. The acceptance by the WTO means deeper integration into the world economy.

3). Policies stimulating urban transformation

The emancipation policies that were initially designed to scale down the size of central government, lessen central government's financial pressure, and give more power to local government unexpectedly became the major driving power of urban transformation. Through government reform, local government gained more powers regarding local infrastructure construction, property ownership, planning and development of international trade, fiscal arrangement, and taxation (Mao 2004). Local investment replaced central investment as the major source of domestic asset investment (Yang 2004). Accompanying government reform was the establishment of a new fiscal system, which was designed to increase incentives to the local governments in revenue collection and local economic development (Tang 2003).

The new fiscal system increases the incentives to the local governments to develop their economies, while the emancipation of power enables them to use whatever ways they see fit to achieve economic development. The ways include more high-grade roads, convenient and fast urban transportation (subway and elevated light rail), provision of

well-equipped office buildings, policy-supported industrial districts, more open spaces, and so on (Wu and Yeh 1999). A large-scale urban physical restructuring seems inevitable in such a political and economic environment. Meanwhile, the fiscal and power decentralization has created multiple power centers (for example, district government), and has brought forth issues of conflict, competition and rivalry between the power centers (Keivani *et al.* 2001). The competition between district governments has caused multi-center cities to replace single-center cities as the major form of Chinese large cities.

4.1.2 From public to private

Housing was public-owned before it was privatized during the reform. In this section, an introduction to China's traditional urban housing system and housing reform will be presented.

1). China's traditional housing system

The housing system developed since 1949 promoted public ownership and excluded the functioning of market mechanisms. Private housing was confiscated and set under the control of the government. All urban housing was actually public housing with no exceptions. Chinese government then distributed this confiscated housing and newly-built public housing directly to urban residents or to work units that further allocated housing units to their employees. Government essentially intervened in the whole process from housing construction and housing distribution to management and maintenance. There was no room for the market to take a role.

This housing system had some particular characteristics. First of all, as just stated, urban housing was predominantly owned by the public sector. Second, housing was

distributed freely among citizens and the only criterion for access to housing was 'need' (Wang and Murie 1996). Every household could have their housing units. But the conditions[10] of the housing units one could get all depended on his/her status in his/her work unit, which usually included ranking and seniority. Other factors such as the size and composition of a family rarely played a significant role. Third, this traditional housing system was integrated into the country's welfare system. The majority of housing buildings were enclosed in working units that consisted of working place, living place, and other supporting facilities, such as stores, clubs, and even schools and hospitals (Wu and Yeh 1999). Work units distributed housing units to their employees as a benefit. The typical housing under the traditional housing system was just basic: a room for a couple, one for the children, a bathroom for every two families, a large kitchen to every three or four families, various community facilities in every block and other leisure/cultural health facilities for every several blocks (Enzo 1987).

The problem of this system was that if the fiscal condition of working units or the government became worse, the living condition of urban residents worsened too. Actually, this was exactly what happened in China before 1978. In 1978, by the end of the Cultural Revolution, the overall housing conditions were extremely poor under the growing pressure of urbanization and a worsening fiscal condition. The average living space per capita decreased from 4.5 m^2 in 1952 to 3.6 m^2 in 1978. One-third of urban households were experiencing housing hardship in 1978 (Li *et al.*1999). In addition, the public housing stock was so huge that most housing lacked maintenance simply because the government did not have enough funding. The improvement of living conditions under

[10] Such as number of rooms, floor, direction, and the age of the housing unit

the old system seemed impossible. Therefore, reform in the housing system was inevitable (Li *et al.*1999, Zhang 2001).

2). Housing reform

Housing reform was implemented with two interrelated objectives (Wu 2001, Huang 2003). The primary objective was to solve the housing shortage and improve housing consumption through privatization and the creation of a housing market. The other objective was to stimulate local economic growth and 'modernization' of the cities, in which commodity housing is used as an important instrument.

Housing reform since 1978 can be classified into four stages (Zhang 2001). The first stage was an experimental period during which three experiments of housing reform were carried out: 1) the full cost price housing sale experiment between 1979 and 1982 in 50 cities; 2) the subsidized housing sale experiment between 1982 and 1985, which was a response to the failure of the first full cost sale experiment; 3) the experiment between 1986 and 1988, which focused on the adjustment of public housing rents.

The second stage between 1988 and 1994 was characterized by implementing the 1988 National Housing Reform Plan, which promoted housing reform in the whole nation and introduced different approaches to housing reform, such as rent adjustment, public housing sale and financial reform (Tang and Xie 1992). The pace of housing reform accelerated after 1992. In 1993, profit-oriented commercial housing development began to surpass the provision of public housing, which indicated that market forces had gradually grown out of the centrally-planned system. Another significance of the 1988 plan lies in the opening-up of the second hand market (resale market). But the stipulation did not come true in Shanghai until early 1998 when Shanghai's urban residents who

bought former public housing were allowed for the first-time to put their housing on the secondary housing market and trade for better housing (*China Daily*, 25 May 1998, 7).

The third stage between 1994 and 1998 concentrated on the establishment of the housing financial system in which the Housing Provident Fund scheme was introduced as a major strategy for restructuring the housing financial system (Zhang 2001). The fourth stage since 1998 was the introduction of housing allowances and the termination of housing subsidies. Before 1998, work units could sell the commodity housing that they bought from the developers, or housing built by the units, to their employees at discounted prices. Since 1998, the provision of all welfare housing has been gradually ended. Sitting tenants of public housing could choose to buy out the property right of their apartments or pay higher rent. Individuals buying public housing at market prices can enjoy a full ownership right. They also have the option of paying a price lower than the market price, but when purchasing units at this lower price, they obtain limited ownership rights or even use-only rights. The 1998 reform aimed to ensure that all housing would eventually be exchanged through the market rather than through the administrative allocation process.

Although the housing reform in Shanghai is generally in line with the framework of the nation's reform, it has some uniqueness. In 1979, Shanghai was selected as one of the 50 cities that conducted the full cost price housing sale experiment, targeting those who had overseas relatives. However, Shanghai's housing reform before 1990 progressed slowly (Wu 2001, Huang 2003). After 1990, the situation changed. Substantial progress was made in raising the supply of better quality housing through heavy investment (Huang 2003, 2004). One reason was the opening up of the urban real estate market to

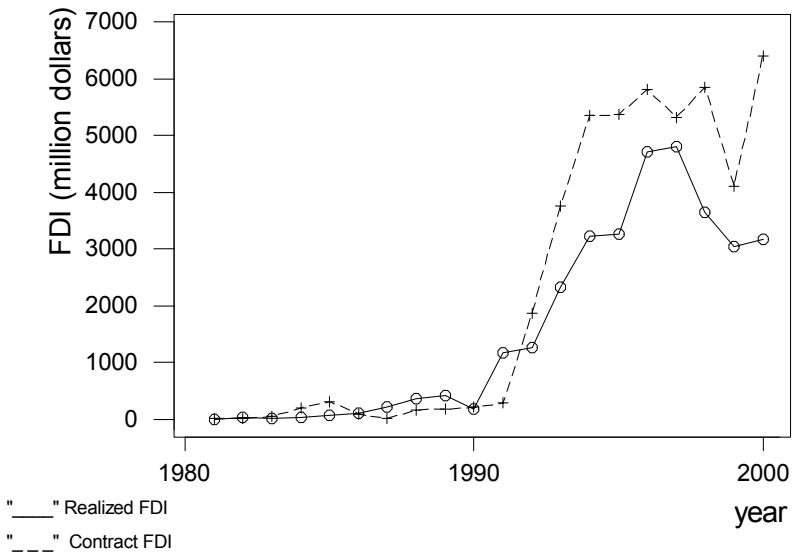
foreign investors starting from 1993. This was the first time that foreign investment was allowed into the real estate market. Meanwhile, steps were taken to stimulate the demand side. Since 1998, all banks have been allowed to provide mortgages to qualified home-buyers. By early 2001, officials estimated that in Shanghai about 60 per cent of all families may have bought their own homes, either from their employers or from private developers (Yusuf and Wu 2002).

4.2 Foreign Investment in Shanghai

Since the open-door policy was implemented, FDI in Shanghai has undergone a progress of rapid growth (Figure 4-1). According to Figure 4-1, we can divide the process into 3 stages:

- The first period is from 1981 to 1991. Three events contributed to the development of FDI in this period. In 1984, Shanghai was named one of the COCs (Coastal Open City) and was granted many favorable policies. In 1986, two economic and technological development zones (ETDZ) were set up in Minghang and Hongqiao districts for foreign investment. The last event is the opening of Pudong New Area in 1990;
- The second period from 1992 to 1997 is a booming period. The opening of tertiary industries in 1992 is the reason for the booming period;
- The third period from 1998 to 2000 is an adjustment stage. The Asian Finance Crisis accounted for this reversal of fortunes because the ability of eastern and southeastern Asian countries and regions to export capital was inevitably impaired by the Crisis (Wei e*t al.* 1999, Sun 2001).

Figure 4-1: The growth of foreign direct investment in Shanghai (1981-2000)



The geographic distribution of FDI is uneven in Shanghai. Pudong new urban area performs very well in attracting FDI. By the end of 1999, the total FDI in Pudong accounted for 29.63% of the total FDI in Shanghai. FDI in Pudong clusters in special development zones (LFTZ, JEPZ, ZHP and WFTZ)[11] while the southeastern area has a low FDI level. These zones are special economic development areas with preferential policies, first-class infrastructure, and other privileges granted by government. In Puxi, the old city area, by the end of 1999, the top 3 districts with the most realized FDI are Jingan, Huangpu and Luwan districts (Table 4-1). Generally, FDI in Puxi is symmetrically distributed along the Huangpu-Jingan axis. FDI decreases gradually along with the distance to this belt (Figure 4-2).

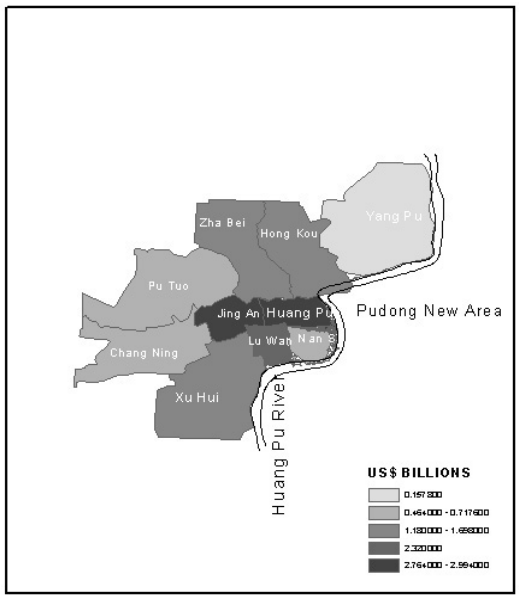
[11] LFTZ-Lujiazhu Finance and Trade Zone, JEPZ- Jinqiao Export Processing Zone, ZHP-Zhangjiang High-tech Park, WFTZ-Waigaoqiao Free Trade Zone

Table 4-1 FDI distribution in Central Districts (by the end of 1999)

District	Realized FDI (US$ billion)	Rank	Investment density (US$ billion/km^2)	Rank
Jingan	2.994	1	0.393	2
Huangpu	2.764	2	0.609	1
Minghang	2.410	3	0.007	10
Luwan	2.320	4	0.288	3
Xuhui	1.698	5	0.031	7
Hongkou	1.497	6	0.064	4
Zhabei	1.180	7	0.041	6
Putuo	0.718	8	0.013	9
Changning	0.514	9	0.013	8
Nanshi	0.464	10	0.052	5
Yangpu	0.158	11	0.003	11

Source: www.shanghai.gov.cn

Figure 4-2 FDI Distribution in Shanghai Central Districts



The sectoral distribution of FDI also is not even. Shanghai's open policies in 1980s encouraged FDI in the industrial sector, but tightly controlled FDI in service sector. One of the results of this policy is that by the end of 1991, 84.1% of foreign invested projects were related to the industrial sector. Entering the 1990s, because the Shanghai

government adopted a "services first, industrial second, extractive third" policy, the percentage of FDI in the services gradually increased. In 1999, the contracted FDI in services accounted for 47.5% of total contracted FDI in Shanghai, which was close to the proportion accounted for by the industrial sector.

4.3 Urban Transformation in Shanghai

Shanghai, the economic center of China, has greatly benefited from the new fiscal system and decentralization of power. Its large economy means that Shanghai has more financial resources to fund its economic development and urban restructuring than other municipal governments. The incomparable political status[12] of Shanghai's mayors also brings Shanghai's government more freedom to decide its local affairs, such as urban restructuring.

The urban structure of Shanghai before 1980s was characterized by the over-concentration of industrial enterprises and work units in the inner city. Work units may include factory buildings, residential quarters for the workers and their families, retail outlets, schools, clinics, and even hospitals (Yeh and Wu 1996, Ma 2002). Since 1980s, Shanghai has experienced a large-scale spatial restructuring which has been articulated in three interconnected ways: reorganization of the city around multiple business and service centers, increased district specialization and the establishment of large-scale development zones (Gaubatz 1999).

The first articulation has lead to multi-nucleation (Gaubatz 1999). On one hand, the status of the old city center, Nanjing Road and Waitan area, was reinforced because of the urban renovation programs. On the other hand, new city centers, such as the Xuhui area

[12] Shanghai's mayor is a member of CCP Political Bureau, the most powerful of political units in China. The former president of China, Zheming Jiang, and the former premier, Rongji Zhu, were both previous Shanghai mayors.

and the Huaihai Road area have emerged. The second articulation is increased district specialization. Residential areas, manufacturing, and commercial districts have been increasingly separated from each other. During the past decades, Shanghai's government has redeveloped the dilapidated neighborhoods for commercial use and relocated the residents to new housing estates in peripheral urban area. Since 1990, the industrial sector located in central city has been replaced by services and the industries have been relocated to planned industry districts in the city's periphery. By the end of 1997, about 700 production sites within the inner city were moved out, making available 3 km^2 of land for use by the service industry (Fang 1997, p. 5). The outcome of the massive renovation of central city and relocation of housing and industry is that a new central business district (CBD) is emerging. The third major articulation, the establishment of large-scale development zones, is gradually reorganizing the city around massive planned areas designed to attract and utilize inward investment. Shanghai has three high-technology and industrial development zones, Hongqiao, Caohejing and Minhang, all of which are located south and west of the city core. Other planned zones, such as export processing zones and free tariff zones, have been established in Pudong.

Meanwhile, urban infrastructure, especially transportation infrastructure, has been greatly improved. Examples included additional subway lines, Huangpu Bridge, Nanpu Bridge, Yangpu Bridge, Lupu Bridge, the inner- and outer- ring elevated highway, Pudong International Airport, the expansion of Hongqiao Airport, and the Shanghai deep-water port. These new infrastructure projects are quickly transforming the city's accessibility, creating new development spaces, and accelerating the conversion of land.

4.4 FDI[13], ET, UT and the Urban Housing Market

Inflow of foreign investment, economic transition, and urban transformation are three closely related processes (Figure 4-3). Working separately or collectively, they influence the urban housing market. In the following, the relationships between FDI, ET and UT and the urban housing market will be illustrated.

4.4.1 Foreign investment and economic transition

In the early years of China's reform, foreign investment did not have much influence on economic transition because the scale of FDI was very small at that time. It was the government who guided and controlled economic transition. Moreover, the reason for economic transition was domestic pressure (Han 2000, Zhang 2001) not any consideration of foreign capital. Decentralization changed the situation by creating the conditions for FDI to influence transition. The reasoning is: decentralization gave local government the freedom to decide local affairs, such as stipulating policies and regulations; government officers used that freedom to create preferential policies for foreign investment[14]. Without the pressure from foreign investment, these policies would not been promulgated and since these policies are important components of economic transition, economic transition in China would not be as it is.

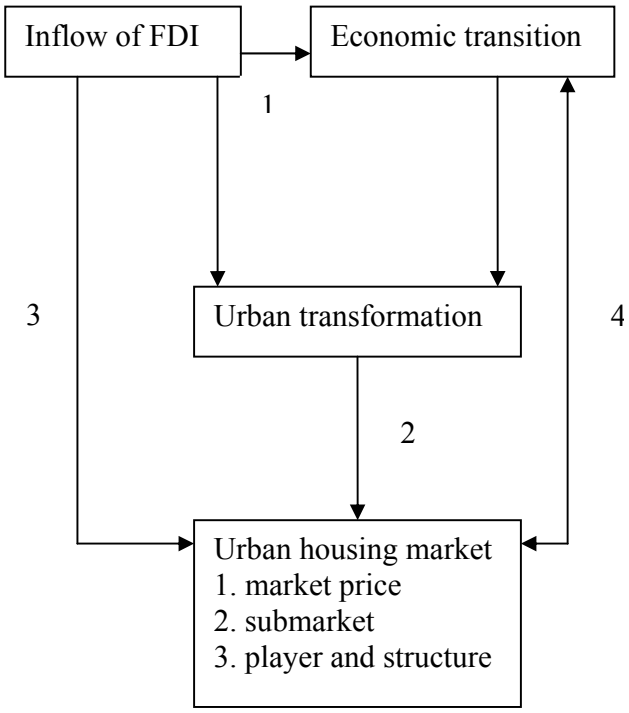
Meanwhile, foreign investment also introduced ideas about the market economy. These ideas were borrowed by Chinese government to establish its own market economy. One example is the housing market. Both the Housing Provident Fund and the National Comfortable Housing Project are the Chinese versions of Hong Kong and Singapore's

[13] In China, FDI is the major effect and symbol of globalization. So in the following, this research uses FDI or foreign investment to substitute for globalization.

[14] Government officers have strong incentives to do this because they must show they have strong capabilities to advance economic development (Wu 2003) in order to be promoted to a higher position. The convenient and fast way to achieve economic development is foreign investment.

counterparts. Another example is China's stock market that also is configured like those in Hong Kong and Singapore in terms of products and services (for example, ST stock, PT stock, and QFII).

Figure 4-3 FDI, ET, UT and urban housing market



Notes:
1. At the beginning, inflow of FDI and economic transition were two separately operating processes. But along with the opening of the country, global competition has accelerated and deepened economic transition.
2. FDI and economic transition indirectly affect the urban housing market through their influence on urban transformation.
3. Foreign investment also has direct influences on urban housing market.
4. Economic transition affects urban housing market. On the other hand, the urban housing market also influences economic transition.

4.4.2 Economic transition and urban transformation:

Economic transition has brought fascinating changes to China's urban physical structure during the past decade (Han 2000). Such changes could not have been realized

without the decentralization of power and the implementation of economic reform in the urban land system, especially the introduction of a housing and land market (Li 2003).

The reemergence of a rent gradient and the introduction of land prices in Chinese cities as a result of the adoption of the land-leasing system provided the work units and the local government with incentives to make profits from trading land (Wu 1997). Meanwhile, decentralization of power provided local government and work units with the freedom to manage their assets, including land. They can sell their land that is located in central cities to generate a substantial capital flow, and then buy peripheral land at a low price to build new facilities for the work units. Through this process the original urban form composed of individual work units (cells) was broken up and changed to a more diffuse one through polycentric and suburban development (Lo 1994, Wu and Yeh 1999, Ma 2002). Moreover, the relocation of work units has led to a large scale redevelopment in the central city and the separation of the home and shopping areas from the workplace (Li and Siu 2001). Without housing and land markets where the land and housing transactions occur, the whole process of urban transformation would not be possible. The housing and land markets actually provide an effective means for readjusting the spatial structure of cities.

4.4.3 FDI and urban transformation:

Foreign investments are extremely sensitive to good infrastructure, cheap land, and preferential government policies (Eng and Lin 1996). In order to attract more foreign investment, local government needs to create these advantages and this occurs mainly through massive urban restructuring. As a result, FDI is becoming a driving force in the formation of Chinese metropolitan structure (Wu 2000).

The significant impacts of foreign investment on urban spatial structure include the development of infrastructure such as transport facilities and communication infrastructure, the establishment of industry zones/parks and Export Processing Zones (EPZs) such as LFTZ, JEPZ, ZHP and WFTZ on the outskirts of Shanghai, and the redevelopment of dilapidated central areas. This is because global companies are inclined to locate their headquarters, representative offices, management offices, sales offices and service centers in the city center and place the manufacturing functions in the suburbs. This arrangement requires a good transportation system.

The integration into the global economic system has opened up new resources for urban development (Wu 2001). Foreign investors have directly provided capital for urban transformation by participating in real estate development in central and peripheral urban areas. Meanwhile, through leasing land to foreign investors, the government has gained a great deal of revenue, which helped local government to finance urban infrastructure projects (Chan 1996).

4.4.4 Economic transition and the urban housing market:

Economic reform, especially land and housing reform, has transformed the roles of government and state-own enterprises in the urban housing market and introduced various independent market players and market mechanisms and rules. Through housing reform, the state was gradually released from providing welfare housing. The role of the state has gradually transited towards regulating, steering and enabling the development of the market. Meanwhile, the introduction of a price mechanism made commercial housing development a profitable venture. As a result, state-owned enterprises and private businesses or joint ventures became independent players in the market as major suppliers

of commercial housing. Another important institution, the real estate intermediary, was introduced into the market because of the reforms. The Urban Real Estate Administration Law (UREAL) (1995) provided legal foundations for the creation of real estate intermediaries to facilitate the development of commercial housing.

In addition to the emergence of new market players, the reforms have established a new market structure, including market principles, and legal and regulatory frameworks guiding land, housing, development and transactions. For example, the 1988 constitutional amendment allowed land use rights to be leased and transferred for the first time. In 1990, the government further introduced regulations guiding leasing and transferring, which laid the foundation for the construction of a market land system. Moreover, in 1995, UREAL was released, which is the first law aiming to regulate the urban real estate market.

Reform of the housing finance system gave another push to the development of the housing market (Zhang 2001). Before housing reform, housing was almost entirely financed by the state through state budgetary funding. Reform of the housing finance system aims to relax the government's control over housing finance, widen the finance sources, change the state-monopolistic approach to a market approach through the development of housing financial institutions, and produces an adequate and stable flow of funds to the housing sector. The banking system also has been reformed to provide easier finance to enterprises, and government financing has been replaced with loans based on market principles.

Housing reform also caused the unique characteristics of China's housing market. That is, three types of property rights coexist in the market. In the 1994 Housing Reform

Resolution, the selling prices of housing were classified into three categories: market prices, cost prices and standard prices. Market prices refer to the sale of full property rights of a housing unit. The purchasers of cost price housing have restrictions on the resale and are only allowed to resell their housing 5 years after purchase, while those who bought housing at standard prices only have partial property rights. In other words, the proportion of property rights sold to individuals is determined by the proportion of full market price paid by housing purchasers (Zhang 2001).

4.4.5 FDI and the urban housing market

Foreign investment was crucial for the establishment of China's urban housing market. It has not only introduced foreign investors into the urban housing market as new market players, but also effectively formed the primary demand for high-quality offices and housing (Wu 1999). Moreover, FDI contributed to capital formation in real estate development. The flow of foreign capital into real estate development was necessary to overcome the initial scarcity of capital and develop a dynamic and profitable real estate market by attracting domestic investment in real estate (Wu 2001).

FDI has also has triggered a change in the rules of the urban housing market. Government officials gradually found that they were not able to control the market as they wanted. For example, instead of dominating negotiations as they did with domestic companies (especially state-owned enterprises), government has to negotiate with foreign investors as an equal (Wu 2001). Otherwise, foreign investment will escape to other destinations.

Last but not least, foreign investment also contributed to the increase in real estate prices in Shanghai. Sustained flow of foreign investment into real estate made Shanghai different from other cities after the tightening of macroeconomic policy in 1994[15].

While FDI has greatly affected the urban housing market in Shanghai, it alone did not create the urban housing market. Rather FDI created initial conditions that have spurred domestic capital investment in the city.

4.4.6 Urban transformation and the urban housing market

The direct influences of economic transition and FDI are largely on the market players and the market structure while urban transformation has direct impacts on housing price through changing houses' locational characteristics, specifically accessibility and amenity. Through their effects on urban transformation, economic transition and FDI also impose indirect influences on housing price. The influences of urban transformation on housing price are relatively straightforward and have been extensively addressed in literature (Edelstein 1974, Straszheim 1975, Johnston 1976, Grigsby *et al.* 1987, Giussani and Hadjimatheou 1992, Gaubatz 1999, Wu and Yeh 1999, Han 2000, Orford 2000, Lin 2001, Fang and Zhang 2003, Lipscomb 2003, Wu 2003).

The next chapter provides an investigation of market structure and market players in the Shanghai housing market. This will help us better understand the modeling results in Chapter 6 and it also is one of the major components of this research.

[15] The 1994 tightening policy caused a price drop in most Chinese cities except Shanghai.

Chapter 5 Market Players in the Shanghai Housing Market

As Lanegran and Palm (1978) suggest, the price of property is also likely to be determined socially by various rules, resources, relationships and strategies[16]. In some circumstances, such as in China, market structure may play an even more significant role in determining housing price. Therefore, it is important to understand both the market structure and the market players who operate in the Shanghai housing market. However, the primary reason for conducting the analysis on the market players and structure is to answer how FDI, economic transition and urban transformation form and modify the market structure and these same factors affect market players. In other words, the main reason is to respond research question 1 (refer to Chapter 1).

5.1 Market structure

Rules are the core component of market structure. In Shanghai, economic transition and FDI powerfully influence market rules. Most policies and regulations[17] on planning, housing development, land acquisition, and household relocation did not exist until the reform period. China's open policies have resulted in the inflow of foreign investment and foreign companies. This inflow was accompanied by an influx of management and operational experience. This experience has helped institute the real estate industry codes for Shanghai's real estate companies, such as building design, project management, etc. Ning Zhu and Jingsong Wang (Table 5-1) both indicated to me that the competition from foreign real estate companies has stimulated the improvement of their routine management and operation and that the improvement was based on their companies'

[16] In the following sections, the term 'market structure' is used to represent rules, resources, relationships, strategies, etc.
[17] Yongdong Zhang (Table 3-1) estimated it was above 90%.

Table 5-1 The major persons in the survey (repeated Table 3-1)

Name	Institutions	Representing
Ning Zhu	Eastern China Regional Center of VanKe Real Estate Group	Developers
Jingsong Wang	Department of Strategic Planning, Goldenfield Development Co. Ltd	Developers
Steve Clarke	Freesia Development Ltd.	Foreign investor
Jun Hu	Jian'an Planning Bureau	Government
Yongdong Zhang	Department of City Development of Shanghai	Government
Dezhong Wang	Research Lab of Shanghai Municipality	Government
Xiaojian Lu	Finance News of Shanghai (Newspaper)	Public Media
Jing Liu	ZhongNan Property Consulting Inc.	Real Estate Agents
Xin Qian	Self-employed in real estate business	Real Estate Intermediary
Zhi Su	Department of Real Estate Loan, China Industry and Commerce Bank (Sichuan Branch)	Banks
Li Qian	Law Department, Huaxia Bank	Banks
Zanhai Li	3rd village of Eastern China Normal University (ECNU)	Households
Facheng Zuo	JiaFu Residential Community	Households
Yun Cheng	JiaFu Residential Community	Households
Ji Li	Tianyuan Residential Community	Households
Lili Zhao	Jingfu Residential Community	Households
Yongyue Zhang	(Dean) College of Orient Real Estate, ECNU	Academia
Bogeng Chen	(Professor) College of Orient Real Estate, ECNU	Academia
Xiaodong Song	(Professor) Department of Planning, Tongji University	Academia
Shiwen Sun	(Associate Professor) Department of Planning, Tongji University	Academia
Yueming Ning	(Professor) Department of Geography, ECNU	Academia
Hongming Zhang	(Professor) the Center for Real Estate Research, Shanghai Academy of Social Sciences (SASS)	Academia
Xuejin Zuo	(Professor) the Economics Institute, SASS	Academia

knowledge of how foreign companies manage and operate. Gradually, the industry codes followed by foreign companies were adopted by local companies and became the rules that all real estate companies in Shanghai's housing market follow.

Land was made available for commercial development during the housing reform. Meanwhile, urban renovation and urban development programs have provided more and more land for developers and investors. Before the reform, government was the only source of funding for housing development. The housing reform and accompanying monetary reform have enabled banks and other financial institutions to provide capital to developers and investors. For example, the money for routine operation and project development in Vanke and Goldenfield is now from banks and the stock market although they are both state holding companies[18]. Moreover, when asked how many real estate companies applied for loans, Li Qian and Zhi Su (Table 5-1) both said "too many". At the same time, the opening of the domestic market has stimulated an influx of foreign capital into the urban housing market. Economic transition also led to the decentralization of power[19]. Local government acquired more power than before for managing local affairs, and different power centers have come into being. This new situation allows a greater leeway than ever before for market players to achieve their housing-related goals. In Shanghai's housing market, power is the most important resource for anyone in the market since the control of power means the control of other resources (Xuejin Zuo, see Table 5-1).

[18] State holding companies not only issue public-owned stocks, but also issue state-owned stocks which are the majority of the total shares.
[19] This refers to political power.

5.2 Market players

Shanghai's housing market brings together a variety of players, including government, work units, local developers, intermediary agencies, foreign investors, households and housing speculators. Land speculators were once major players during early 1990s but they as a group do not exist in today's housing market because land use policies have become much more stringent since 1994.

5.2.1 Government

The state plays a role in real estate development, include planning, land allocation, relocation, development, and consumption.

(a) Planning

In Shanghai, all development projects must comply with the urban master plan. However, planning is not always strictly regulated and is likely to be modified continually. The reason is, as an anonymous interviewee working in a major university in Shanghai told me, "continued modification of planning rules can bring a lot of benefits to many government officers at certain positions". Moreover, economic transition and FDI have caused constant shifting of the balance of power between the government and economic interests, which is another reason complicating the formation and implementation of urban planning in Shanghai. As Yeh and Wu (1996) state, the formation and implementation of urban planning now involves many agencies and actors who stand for various interests. The flexibility of urban planning leaves a great maneuvering space for developers and investors to implement their projects. Another anonymous interviewee who works in the planning department told me it was not unusual

to be asked to modify a plan when the modification would benefit certain real estate developers and projects, or certain areas.

(b) Land provision[20]

After getting the permission from planning authorities, the next step of real estate development is land acquisition. In Shanghai, government is the land owner and land provider. Land is leased by government free of charge under long-term leases free of charge to work units and other state-owned institutions. Land is leased by the government for a charge and for much shorter terms to private companies. Land under free, long-term lease by the government to work units or other state-owned institutions can be sublet in the short-term for a charge by those entities to private companies as well, thus there are sizable profits to be made by work units and government institutions in the land market. In Shanghai, this process is centered on the Shanghai Land Reserve Center, a branch of Land and Resources Bureau, which acquires urban land from urban residents and state institutions as their leases expire and reclaims rural land from farmers by authority, and then leases land to work units, government institutions, and private companies according to the Shanghai master plan or unit, institution and private company request (Xiaodong Song and Shiwen Sun, see Table 5-1).

The potential for profit is very attractive to government departments and officials who want to gain part, if not all, of the profits of the land transactions. They cannot achieve this under the formal or legal process because any profits will become part of the revenue of the government. Therefore, the informal or quasi-legal process of land

[20] Land allocation refers to the transfer of land use rights from the state to the users through land leasing (Wong and Zhao 1999).

subleasing came into being[21]. The emergence of an informal process not only provides a new way for developers and investors to acquire land, but also causes the loss of public credibility of government. The interviewees who are common Shanghai locals, such as Facheng Zuo, Yun Cheng, Ji Li, and Zanhai Li (Table 5-1), all think the government knows of the existence of the informal or quasi-legal land market but because the government is too vulnerable to the influence of developers and investors, it can not stop the market.

(c) Relocation

Before constructing buildings, the sites need to be cleared and previous residents need to be relocated. This is especially important for development projects in the old central areas of the city that are densely populated. Shanghai local government is usually responsible for site clearance and resident relocation. Without the support of the local state and the use of various land acquisition regulations, it is impossible to achieve prompt site clearance (Wu 2000). Affected residents are usually compensated, but may not receive the market price. Relocation is a controversial topic. This research will discuss this topic in greater detail later.

(d) Development

The Shanghai government is also the principal investor in most real estate companies that dominate the local land-development business. According to Jing Liu's (Table 5-1) estimation, there are about 200 real estate developers that are state invested, accounting for 80% of the developers in Shanghai's housing market. The development companies that are owned or partly-owned in by the state are more likely to benefit from preferential policies, such as modified planning, and concessions or waiving of development-related

[21] Wong and Zhao (1999) have detailed the formal and informal process of land allocation.

taxes, for example, the land value increment tax (Jing Liu) because "they help the government in local development" (Yongdong Zhang, see Table 5-1). The goal of government in setting up development companies is to promote local economic development and to provide subsidized or welfare housing to low-income households (Yongdong Zhang).

(e) Housing provision

The government and government agencies (for example, work units and housing bureaus) still play significant roles in housing provision although the provision is increasingly moderated by the market. Government is the only public housing provider in Shanghai's housing market. The Housing Management Bureau controls the majority of public housing even though the stock of public housing is dwindling.

The influence of FDI, economic transition and urban transformation on the role of government is evident. Economic transition has led to the housing reform while the housing reform has reduced the role of the state in the urban housing market through privatization and commercialization of housing. In addition, decentralization has led to multiple power centers. The competition for capital from other localities/power centers has further weakened the once unchallenged role of the Shanghai government in the market. Last, economic transition and FDI have introduced various players to the market, which help strengthen the role of the market.

Despite these difficulties, all interviewees think government is the most powerful player in the market. The Shanghai government still guides urban development, provides supporting infrastructure, and intervenes in resource distribution, such as land allocation and cheap capital allocation. The powerful role of government as the decision-maker,

regulator, resource controller and participant in the urban housing market cannot be under-emphasized.

5.2.2 Work units[22]

Work units are unique players in China's housing market. China's reform has reduced the coordinating power of the state and increased the autonomy of work units (Zhang 2001). Although still controlled by the state, work units have become profit oriented and act more and more independently. The implications of this change to the Shanghai's housing market are two-fold. On one hand, according to Xuejin Zuo, Hongming Zhang, and Xiaojian Lu (Table 5-1), as work units gain a high level of autonomy, they invest production funds in property markets. The ratio of housing investment to GDP can be used to highlight the tendency of capital shift from the sphere of production to the built environment (Wu 2001). From 1990 to 1999, this ratio changed from 3.47% to 9.04% (Shanghai Bureau of Statistics 2000). Many work units operate their own real estate projects or cooperate with real estate companies in real estate development. Bogeng Chen indicated to me that some projects were to solve the housing problems for the employees of work units[23], but many more projects are purely for making profits through selling housing on the market. Work units have changed from the provider of welfare housing to profit-oriented real estate developers.

The other indication of the change is related to land supply. The shift of capital from the production sphere to the built environment, together with falling profits from production, results in serious problems such as the reduction of employment, relocation

[22] Work units are state-owned institutions and enterprises.
[23] This part of housing transaction is not subject to the influences of market. Inclusion of this kind of housing in the database is part of the reason for the unexpected results of hedonic models (refer to quantitative analysis).

and even closure. Both local governments and state enterprises urgently need capital to solve these problems. For work units, the fastest and most convenient way to acquire capital is to sell the land they occupy. While the state holds the nominal right of ownership, control of land is defined through actual occupancy and therefore is in the work units' hands. They can sell the land to investors through the legal, quasi-legal or illegal land market. Investors are also willing to deal with work units because it is much easier to negotiate with them (Ning Zhu, see Table 5-1).

In addition, work units used to be the major housing builders. Because of housing reform, they have withdrawn from direct involvement in housing construction. As a substitute, they bought housing from the market and then distributed it to their employees[24]. Recently, due to the deepening of housing reform, they do not directly provide housing for their employees any more, but they continue to provide housing subsidies in somewhat different forms (for example, Housing Purchase Subsidy- *gou fang bu tie*, and Housing Provident Fund- *zhu fang gong ji jing*) (Huang 2004). As Yongyue Zhang and Bogeng Chen (Table 5-1) said, in Shanghai it is a common practice for the high profile work units to provide large subsidies to their employees.

In summary, the roles of work units in Shanghai's urban housing market have diversified during the past few years. Economic development, urban transformation, and FDI have created growing demand for urban land and housing. Meanwhile, economic transition has given work units more autonomy in using the resources they control. Work units take advantage of this growing autonomy and have made themselves major commodity housing providers and land suppliers in Shanghai's housing market.

[24] same as footnote 34.

The transformation of their role has led to many negative outcomes. For example, in order to profit from transferring land use rights to investors and redevelop the site they occupy, the work units are eager to relocate their workers to new developments in suburban locations, but they often don't provide enough compensation to their employees. This has caused many social conflicts. The enthusiasm of work units for real estate development and land use rights transfer originates from insider (work units managers) control. "*The insiders have the actual control of the work units. Therefore, they can use any resources of the work units to meet their personal needs*" (an anonymous interviewee). In addition, the role of work units as land suppliers conflicts with the role taken by the state. By law, government has the ultimate ownership of land. Only government has the right to determine who can use the land and how to use it. However, the fact is work units are the actual occupiers of urban land. The attempt of both sides to control urban land often triggers competitions between work units and government. Sometimes, this competition even becomes open conflict when the power of work units is large enough. The black land market is a by-product of this competition. On the black market, illegal or quasi-legal land transactions between work units and real estate investors are not subject the control of the state.

5.2.3 Developers

Before economic transition, government and work units were the only housing suppliers. Developers have emerged as the major housing providers in China's housing market since 1990. The emergence of developers is attributed to housing reform, specifically the commodification of housing and the establishment of the urban housing

market. There are three types of local developers in Shanghai's housing market, state-owned developers, collective-owned developers, and private developers.

Compared to government and work units, developers are more centered on making profits. Their strategies and activities in the urban housing market reflect this. In order to achieve their goals, they must control as many resources (mainly, land and capital) as they can because control of more resources means greater advantage. In addition, they consistently strive to modify the rules (mainly, planning and taxation) and the relationships with other players (mainly, government and foreign investors) so that they can take as much advantage of the rules and relationships as they can. In a word, developers aim to control or modify everything that is helpful for making a profit. These activities have resulted in the bribery of the employees of government and other related institutions. Most interviewees in academia and public groups agree that bribery is inevitable. Yet, the positive effects of developers' strategies and activities also should be noted. For example, Ning Zhu (Table 5-1) told me in order to maintain a good relationship with the Shanghai government, his company had taken part in some projects to build 'welfare' housing and housing for relocated residents. Moreover, according to Yongdong Zhang and Steve Clarke (Table 5-1), local developers have connections and knowledge of the local scene, which is extremely helpful for inexperienced foreign investors. Thus the cooperational relationship developed by local developers and foreign investors has contributed to the favorable environment for investment.

Developers' business requires government approvals and concessions or work units' concessions. For example, building at a higher density than current plans allow, getting infrastructure installed at public expense, receiving loan or fiscal subsidies from the

municipality, or getting cheap land, all require approval or concessions. Therefore, in many real estate projects, developers form partnerships with the government or work units. For example, in the Taipingqiao Redevelopment Project, Shui On Group formed a partnership with the Jin'an district government (Jun Hu, see Table 5-1). Government and work units also welcome the partnership because developers have access to large amounts of capital from a variety of sources, such as equity capital, bank loans, government and collectives, and bonds and securities. They also have the advantage of owning the specialist knowledge in real estate development (Jun Hu, Yongdong Zhang).

5.2.4 Foreign investors

The inflow of FDI into Shanghai stems from the restructuring of international finance, the decline in economic returns in traditional investment locations, and the willingness of the Shanghai government to subsidize foreign investment (Wu 2000). Foreign investors are both suppliers and consumers in Shanghai's housing market. In the market, foreign companies and joint ventures provide effective demand for high-quality housing, which leads to increasing housing prices. In terms of supply, foreign investors are seldom directly involved in housing development (Steve Clarke, see Table 5-1). However, they are one of the capital providers of some housing projects operated by local companies. For example, since Shanghai government passed the regulation of using foreign investments to develop domestic housing in 1993, inward investment has accounted for larger and larger proportions of the total investment in the real estate market (e.g. 1/3 in 1995).

The introduction of foreign investment is triggering a change in the 'rules of the game' (Wu 2001). This is because foreign investments, unlike domestic investments, are

'global' money and therefore are resources beyond government control. They follow a clear economic motivation and are less bound by intragovernment politics, social responsibilities, ideological commitment and even planning control. Furthermore, foreign investors are able to raise a large amount of capital within a short period of time (Steve Clarke, see Table 5-1). This is particularly attractive to the Shanghai government who is keen to initiate large projects but is constrained by a lack of capital. In order to attract more foreign investment, the government is willing to formulate preferential policies to satisfy external investors (Yongdong Zhang and Dezhong Wang, see Table 5-1).

However, this does not mean that foreign investors can act in the market totally outside of institutional constraints, nor are the policies of government irrelevant. The action of foreign investors is still subject to the influence of the Shanghai government. In order to be granted preferential treatment, foreign investors usually need personal contacts with government officials (Steve Clarke). In some cases, using the incentive of preferential treatment, the Shanghai government can even initiate and usher foreign investment to its desired locations.

In terms of the relationship with local developers, the most common relationship is the partnership. This is because foreign investors are constrained by a lack of local knowledge and institutional networks (Steven Clarke, Xin Qian, and Yongyue Zhang, see Table 5-1).

5.2.5 Intermediaries and financial institutions

Intermediaries are the facilitators of China's urban housing market. The Regulation on the Administration of Urban Real Estate Intermediaries announced in 1996 defines the scope of services by real estate intermediaries in the Shanghai housing market. This role

includes 1) providing consultancy services on real estate legal issues, policies and technical issues, 2) providing information services and analysis on real estate development, transactions, and rental, 3) real estate evaluation and feasibility studies for development projects, 4) real estate agents and rental services, and 5) document services on real estate transactions and rental.

Financial institutions are also crucial for real estate development. Real estate development is a highly leveraged industry. Development firms have traditionally operated with little of their own capital, borrowing instead against the value of their projects upon completion. Without the capital support from financial institutions, the urban housing market would not run smoothly.

Corruption also plays a role in the housing market. Real estate intermediaries, financial institutions, and developers attempt to manipulate the market and housing demand to enhance profits (Wang 2005, Wei 2005). This manipulation may occur in several ways (two anonymous interviewees in academia). On the supply side, once a project is finished, the intermediaries may buy up most housing units, leading to an artificial shortage of housing. On the demand side, intermediaries, may exaggerate the shortage of housing by publicizing 'rapid urbanization', 'population increase', 'a shortage of land and housing supply', etc., and promote housing consumption and increase households' housing aspiration level[25] through advertising "wealthy housing" (*xiaokang zhufang*). The banks also encourage housing consumption through low mortgage rates and loose mortgage control.

[25] The "quality" of housing that everyone wants

5.2.6 Households

Although some households speculate in housing through buying apartments, holding them vacant for a short period to catch the price 'bubble', and then reselling them, the overwhelming majority of households are pure housing consumers. In the Shanghai housing market, there are many options for households' housing consumption (Table 5-2).

Table 5-2 Options for households to improve their housing consumption
(modified from Huang 2003)

Options	Qualifications
Purchase 'commodity housing'	Households with high income and urban and permanent hukou, with a few exceptions (for example, blue hukou)
Purchase 'affordable housing'	Employees of government agencies and work units who have medium-low income, urban and permanent hukou
Purchase occupied public housing	Sitting tenants of public housing who are usually employees of government agencies and work units, and have urban and permanent hukou
Purchase or rent flats that work units purchased from developers	Employees of government agencies and work units, with urban and permanent hukou
Rent 'cheap rental housing'	Households with lower than minimum income and housing consumption according to criteria set up by the local government; and who have urban and permanent hukou
Purchase or rent of private housing by individuals	Everyone
Purchase 'relocation housing'	Households with permanent and urban hukou who are affected by urban renewal projects

However, these options are not available for every household. In addition to the constraints of affordability, the socialist institutions such as the Household Registration (hukou) System[26] and work units may limit the options. In general, only people with

[26] The hukou system, developed in the 1950s, has been an important tool for government control and could be considered to be an internal passport system as it defines an individual's socioeconomic status and opportunities (Chan 1994). Every Chinese is born with either an urban or a rural hukou, based mainly on birthplace, and either a permanent or temporary hukou based on the place of registration.

urban and permanent hukou are qualified for state welfare benefits such as subsidized housing. Moreover, as most welfare benefits are distributed through state-owned work units, a person's work-unit affiliation also becomes vital in accessing benefits.

The relationship between households and developers is crucial for the stability of Shanghai's urban housing market because this relationship is usually characterized by conflict. Conflict occurs mainly because of two incompatibilities. The first incompatibility is increasing housing price and relatively stable household income; the other is household loss caused by relocation and insufficient relocation allowances. While both incompatibilities can lead to conflict, the latter is more prevalent. The redevelopment of Shanghai's old urban areas has caused the relocation of hundreds of thousands. Since 1990, there have been about 100 million households relocated (Han[27] 2005) for urban renovation. It is in the best interests of developers to relocate households at the least expense. Meanwhile, companies under contract with the developers[28] for the relocation exercises also intend to maximize their profits at the expense of residents, further reducing the amount of compensation or providing even smaller units than those to which residents are entitled. As these relocation companies are mostly government-owned, they may even mobilize the police force to evict residents. Furthermore, the pace of demolition is so rapid that in some cases residents are required to vacate their old housing before they find transition housing. Ji Li, a resident of Tianyuan Residential Community that was scheduled for demolition within a year, told me that he was fully of the planned redevelopment. However, due to a lack of resources, residents such as Ji Li cannot successfully defend their rights in conflicts with developers.

[27] Han, Zheng is current Shanghai's mayor.
[28] Developers do not always outsource relocation to such companies. Sometimes they also take this dirty job.

The Shanghai government also should be responsible for defusing the conflicts. As the only place where households can seek help, the government must deal with the inflated housing price and complaints from households in order to maintain a stable society. However, since the government also gains from moderately rising housing prices and urban redevelopment, they seem in a difficult position to take action. As Jun Hu (Table 5-1) said, they always feel it difficult to decide what to do when they have to mediate the conflict between developers who want to clear the land and the people who usually have nowhere to go.

Although foreign investors and work units both gain from urban redevelopment, they have a different picture of rising housing prices because rising housing prices may result in upward pressure on wages. Thus they stand on the side with households and against developers who ask higher housing prices (Steve Clarke).

The impacts of economic transition, FDI and urban transformation on households are uneven. In Shanghai, as well as in other cities, since housing subsidies and the maximum amount of space a household can purchase at the subsidized price are determined by institutional factors such as job rank and job seniority[29], people with higher job ranks are more likely to purchase larger housing units. Moreover, a work unit's financial condition determines its ability to provide subsidized housing to its employees (Huang and Clark 2002). Therefore, resourceful work units, such as high-ranking work units owned by ministries or the central government, can provide large housing subsidies to their employees while work units with few resources can provide few or no subsidies. For example, Yun Cheng (Table 5-1), an employee of Shanghai Commercial Bank, received

[29] Yongyue Zhang and Bogeng Chen (see Table 5-1) suggested to me although the specific rules of each work units were different, job rank and job seniority were the most important determining factors.

300,000RMB when she bought her first apartment while Facheng Zuo, an employee of Shanghai Tunnel Engineering Corp., received only 70,000RMB. These people (people with higher job ranks and people employed by high-ranking work units) and their households are likely to continue to be better off because they can trade their housing bought with subsidies for larger and better housing on the market. Even though they choose not to trade their housing, they can use it as security for raising money, and can hand it on to future generations. Meanwhile, FDI has introduced thousands of foreign companies in Shanghai, which stimulate the emergence of a large group of high-waged professional and managerial workers. This group of people is also likely at an advantage because with their high income. For instance, Lili Zhao (see Table 5-1) whose husband is the vice director of GE Insurance, China, told me in 2004 someone wanted to buy their apartment at about 1,500,000RMB, which they bought in 2000 at about 600,000RMB. The employees of foreign companies, as well as those employed by the high-profile work units, compose the major group of housing consumers. In addition, measures to promote homeownership--- such as low mortgage interest rates and non taxation of implicit rental income--- tend to favor this upper-income group.

On the other side of the coin, low-income households (households employed by work units in poor condition and many new immigrants) are at a disadvantage in Shanghai's urban housing urban market. The disadvantage is reflected in several ways. First, high housing prices create the poor living conditions of these households. The low income households who are usually housing renters are asked to pay higher rents, while those low income households who 'luckily' own a dwelling unit are trapped in the previous shabby

housing units and have no chance to upgrade their housing (Wang and Murie 2000). (Picture 5-1).

Picture 5-1 Typical public housing units in central city of Shanghai

Although the Shanghai government has carried out "The National Comfortable Housing Project (*anju gongcheng*) (1995)" and the "Economic and Comfortable Housing (*jingji shiyong fang*) (1998)"[30], both of which emphasize developing housing for low- and middle-income groups, these projects turned out to be ineffective because many high income households took advantage of these projects, claiming they were low income families, and the housing price under the programs is still too high for low income households.

Second, large scale urban redevelopment and renewal have harmed low-income households more than other groups. In 2001, the city demolished unfit and shanty apartments covering 3.6 million m^2. Most of these were located in the old central city and

[30] The housing units developed under the two projects were sold at cost to low-income households. The key factors that reduce the price include free land allocation, a regulated profit level for developers, smaller housing size, and reduced government charges during the development and sale process (Wang 2001).

occupied by poor households. About 400,000 residents were relocated because of the demolition. According to Yongyue Zhang, Bogeng Chen, and Hongming Zhang (see Table 5-1), these residents have three options to solve their dwelling problem: pay a portion of redevelopment costs to acquire a new commodity housing unit on-site, buy new commodity housing elsewhere with both relocation compensation and personal funds, and buy a municipal relocation housing unit at cost price. However, the first two options are usually not feasible because commodity housing is usually too expensive for these residents even with relocation compensation. For example, the "Shanghai's Urban Housing Demolition and Residents Relocation Regulation Details (2001)" stipulates that the relocation compensation should equal the average transaction price of public housing in the same area. However, as we know, public housing is usually transferred at a subsidized price that is far lower than the price of commodity housing. Therefore, the relocation compensation is also far lower than the cost of a commodity housing unit. The last option is often the most affordable one, but relocation housing tends to be insufficient and to be built in peripheral locations. It was reported that only 10– 40 per cent of households could be directly resettled in relocation housing (Xiaojian Lu, see Table 5-1). The rest would need to find their own accommodations. In addition, the residents who are driven to peripheral areas encounter an increase in transportation costs, which causes them difficulties.

Among the low-income households, new immigrants are especially disadvantaged[31]. These immigrants are usually low-skilled workers engaged in manufacturing, personal services and the hotel, tourist and entertainment industries (Friedmann 1986). Because

[31] The immigrants who are typically well-educated and assigned hukou are on par with those of local residents in terms of housing consumptions.

the current housing system actually prevents them from improving their housing (Table 6-7), the new immigrant populations tend to lose out in the competition for housing. In 1994, blue-stamp household registration, an alternative for immigrants to improve their housing was introduced. However, since the blue-stamp was only issued to high-income immigrants and the bank mortgages for new commodity housing were restricted to people with local *hukou*, this was an ineffective alternative for improving low income immigrants' housing, and thus it was terminated in 2002.

In the next chapter, this research will employ hedonic modeling to quantitatively explore the effects of FDI, economic transition and urban transformation on housing price. Given the mixture of government provided and market-based housing, the continuing influence of the government and quasi-governmental organizations such as work units in the emerging housing market in Shanghai, and all other distinct features of Shanghai's housing market, one would expect that hedonic modeling would not work.

However, the market is playing an increasing role in Shanghai and, in at least some housing sectors, the market now plays the dominant role. Thus hedonic modeling may work for at least some portions of the Shanghai housing market. Moreover, the application of hedonic modeling can be justified by my data. First, the duration and the physical extent of my data are restricted and not subject to severe shocks. In this case, according to Maclennan (1997) and Wihelmsson (2000), an equilibrium condition can reasonably be assumed. Second, the data are from the secondary market which is less subject to insider control. Third, in the secondary market information is more readily available for buyers and sellers, thus it is more reasonable to assume there is no

information barrier, which indicates that the implicit prices (coefficients of independent variables) are unbiased (Wihelmsson 2000).

Chapter 6 Empirical Study

This chapter provides a quantitative analysis of the effects of economic transition, foreign investment, and urban transformation on housing price. In this chapter, I first discuss the data before turning to a discussion of the model results.

6.1 Data:

As shown in Table 3-4, housing price data could be obtained mainly from unpublished government files and newspaper advertisements. In fact, I did not do the field work for the housing price data by myself. The housing price data in my research are from Prof. Fulong Wu who is a lecturer in the Department of Geography of University of Southampton in U.K. It is he who did the field work and collected the data from the Shanghai Real Estate Exchange Centre (SREEC), the Shanghai Housing and Land Bureau and newspaper advertisements. The original data consist of a total of 3207 records of residential properties which were for sale in August 2000 in 13 districts[32]. The size of the sample was reduced to 1,604 by means of stratified sampling according to the total number of properties available for sale in each district. This reduction of sample size was mainly necessary because of the heavy workload of identifying property locations. After incomplete cases had been removed, the sample size was finally reduced to 1,369 valid cases. The properties are mainly in the central and inner districts. Three outer districts (Baoshan, Jiading, Minhang) and the Pudong new district were also included.

The variables in the database and their meanings are provided in the Table 6-1. In Wu's original database, only housing prices, housing structural characteristics and

[32] These are 11 districts in the central city, Changning, Hongkou, Huangpu, Jing'an, Luwan, Nanshi, Pudong, Putuo, Xuhui, Yangpu, and Zhabei, and 2 districts in the peripheral city, Baoshan and Minhang

property right characteristics are included. Wu has used this original database in his research (Wu 2002a, 2002b). However, he did not consider locational variables, i.e. distances, in his research. All the distance data in my database were measured by myself using ArcGIS and the georeferenced map provided by Wu. The information about the location of the commercial centers, FDI concentrated areas, foreigner concentrated areas, new urban areas, and renewed urban areas is from public publications, such as *Shanghai Yearbook,* or from my field survey.

The properties included in this sample are all from the secondary housing market, because the price of the existing housing stock is more stable than that of newly built 'commodity' housing[33]. The price of new housing is influenced to a large extent by arbitrary decisions made by developers. Because transaction prices are confidential, in this study I used the asking price. This is not unusual in property-price research (for example, Orford 1999, Peter *et al.* 1994). In the secondary housing market, the asking price represents a careful consideration of the market situation. It has been found from fieldwork that there is a possible swing of ±10% between asking price and transaction price, arising from market fluctuations and individual bargaining (Wu 2002). Moreover, because of the short period of time for which data was collected and the low inflation rate during that period, temporal changes in price across the study period can be ignored. The variation due to different bargaining skills in individual cases can be regarded as a random disturbance of the transaction price.

[33] Asking prices in the secondary market are more reliable than in the new housing market (commodity housing market). Although the secondary market is still in an embryonic stage in China, in reality the practice of housing exchange in the pre-reform period (Cheng, 1999) revealed the value of existing housing stock. The prices listed in the real estate exchange centers and property agents are therefore carefully set. Also, the buyers in the secondary market are mostly individual households, rather than state workplaces. Therefore, the prices are less affected by corporate buyers and developers.

Table 6-1 Data description

Housing price	asking price
Housing structural characteristics	number of bedrooms, number of living rooms, building type (multi-floor apartments, high-rise apartments, old lane apartments, new-built lane apartments, garden house, others), floor
Housing reform (Property right characteristic)	full commodity rights, partial commodity rights, lease-only rights
Housing locational characteristics	distances to shopping centers, to major road, to subway station, to open space
Foreign investment	distances to FDI planned zones; distance to foreigners' residential areas
Urban restructuring	distances to large-scale renewed urban areas, to newly-built or newly-planned urban areas

Notes:

1. Total number of rooms= the number of bedrooms + the number of living rooms + the number of bathrooms + the number of kitchen

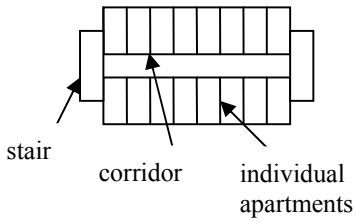
2. Old lane apartments: the apartment building with the structure like figure 1 but built 5 years ago; coded as 1

New lane apartments: the apartment building with the structure like figure 1 but built within 5 years; coded as 2

High-rise apartments: the apartment building with more than 5 floors; coded as 3 in the database

Multi floor apartments: the apartment building with 5 or less floors, not including lane apartment building; coded as 4 in the database

Garden house: usually has two to three floors and includes private open space; coded as 5



3. Lease-only rights: the occupant is actually tenant; he/she has no right to sell or lease the apartment; however, he/she has the exclusive right to rent the apartment; coded as 1

Partial commodity rights: the occupant has partial rights, i.e. he/she can lease the apartment but can not sell it; coded as 2

Full commodity rights: the occupant can sell or lease the property; coded as 3

4. The units of distance is kilometer.

5. New urban areas refer to newly-built urban areas.

6.2 Modeling

I used a hedonic model to investigate the effects of FDI, economic transition and urban transformation on the urban housing market. Table 6-2 shows the descriptive summary of the final dataset.

Table 6-2 Dataset Summary

	Variable	Mean	SD	Min	Max
Dependent Variable	Price (*10,000RMB*[34])	19.156	23.177	2.000	400.000
Independent Variables	Number of bedrooms	1.831	1.054	1.000	15.000
	Number of living rooms	0.480	0.567	0.000	2.000
	Floor	4.269	3.835	0.000	28.000
	Distance to shopping centers (*km*)	2.555	3.052	0.004	34.951
	Distance to FDI planned zones (*km*)	2.563	2.188	0.000	24.168
	Distance to all open spaces (present and planned) (*km*)	0.826	1.449	0.003	25.735
	Distance to all subway stations (present and planned) (*km*)	1.334	2.261	0.044	33.267
	Distance to newly-built urban areas (*km*)	12.613	3.793	0.377	28.303
	Distance to large-scale renewed urban areas (*km*)	2.533	3.351	0.000	39.623
	Distance to major roads (*km*)	0.256	1.162	0.000	22.407
	Distance to foreigners' residential areas (*km*)	3.879	3.080	0.004	32.335
	Building type	3.671	0.745	1.000	5.000
	Property right type	2.261	0.785	1.000	3.000

Notes:

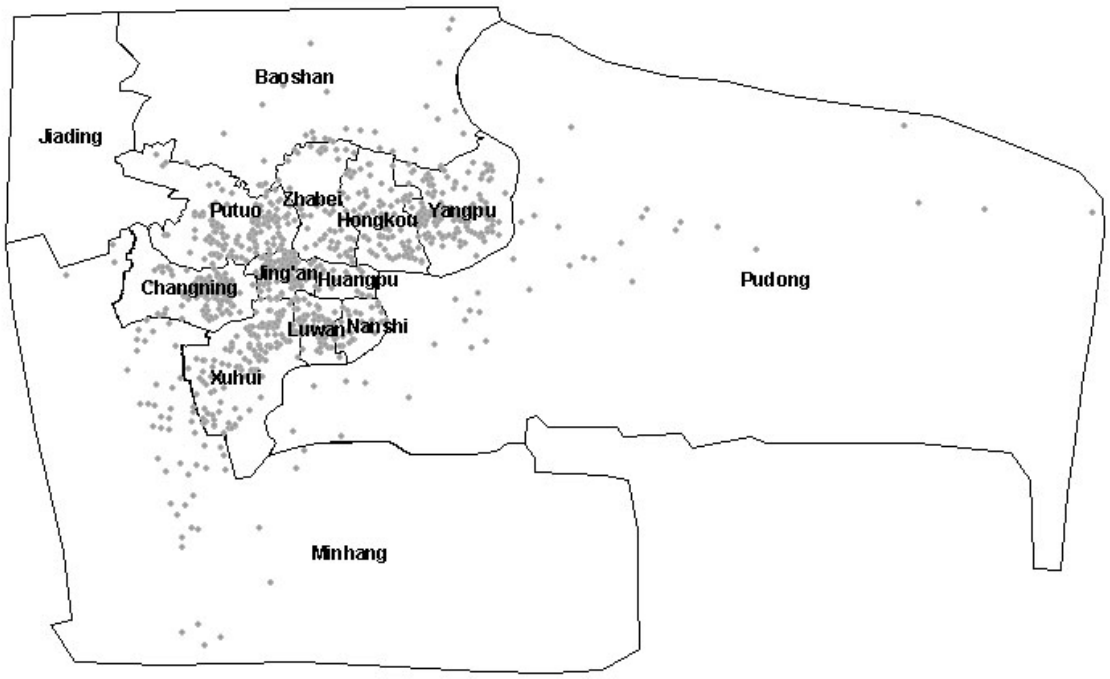
1. Distance is that from a dwelling unit to the nearest object. For example, distance to shopping centers refers to the distance from a dwelling unit to the nearest shopping center.

The mean values of the number of bedrooms, of the number of living rooms, and of price indicate that most records of the sample are Shanghai's middle-class and lower

[34] 1 US dollar is equivalent to around 8.3 RMB.

middle-class dwelling units[35]. Moreover, the mean values of floor and of building type suggest that the major building type of the sample is the multilevel apartment building. In terms of geographic distribution, most records fall within the central 10 districts, i.e. Yangpu, Hongkou, Zhabei, Putuo, Changning, Jing'an, Huangpu, Nanshi, Luwan, and Xuhui. Baoshan, Pudong and Minhang also have some records (Map 6-1).

Map 6-1 The Geographic Distribution of Sample



This research uses the distance to FDI planned zones (FDI-funded business districts and industry zones that are planned mainly for foreign companies) and the distance to foreigners' residential areas as proxies for foreign investment. This representation has been used before (Haila 2000). The volume of FDI and the number of foreigners are positively correlated with other foreign investment variables, such as the number of foreign companies and the number of employees of foreign companies (Hill and Munday

[35] A typical Shanghai middle-class apartment in 2000 had 2 bedrooms, and one living room, and its market price ranged from 200,000RMB to 300,000RMB (Shanghai Bureau of Statistics 2001).

1995, Sun 1998b). The deeper a city is involved in global economy, the greater the volume of FDI and the number of foreigners. Using distances rather than the volume of FDI and the number of foreigners is necessary because it is impossible to associate a unique volume of FDI or number of foreigners with each housing unit. This also makes sense because households are willing to pay a premium for living close to FDI planned zones where jobs are plentiful and to foreigner's residential areas because there are a number of western style entertainment facilities located there. Foreign investment does not affect housing price directly. The real underlying factor is the jobs that foreign investment creates. Employees of foreign companies have to commute to their work places so they care about the distance from their apartments to FDI planned zones as well as the distance to foreigners' residential areas (because these areas have a more pro-western culture).

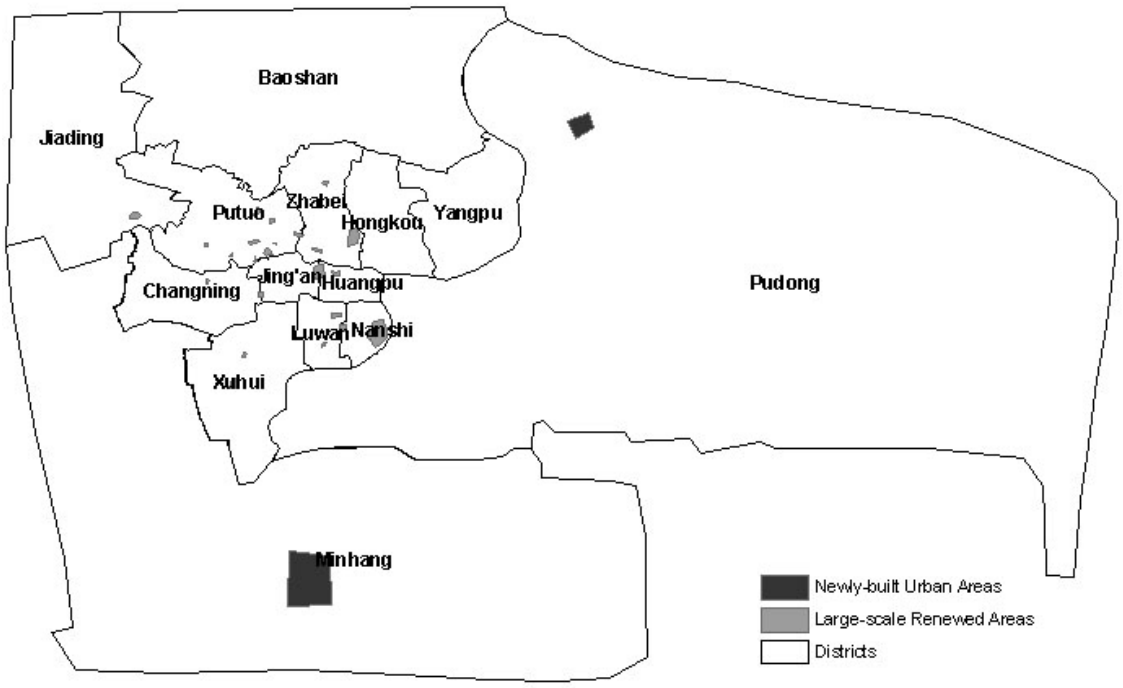
Property right type is used as the proxy for economic transition. As mentioned before, one of the pillars of China's economic transition is the housing reform and the core of this reform is privatization (Wang and Murie 2000, Zhang 2001). The gradual process of privatization has resulted in different types of property rights coexisting in the housing market. Specifically, housing units that were privatized in different periods are associated with different property right types. Therefore, the property right type of a housing unit can reflect the influence of housing reform/economic transition on the unit. It is hypothesized that housing price is associated with property types, which makes China's housing market somewhat unique. Although other policy variables, such as tax rate and urban planning, should also be used, they are difficult to measure quantitatively and differentiate by individual property.

Urban transformation is reflected in the construction of new urban areas, the renewal of old urban areas, and the transformation of infrastructure. This research employs the distances to newly-built urban areas and large-scale renewed urban areas to measure the influences of urban transformation on housing price. Variables representing transformation of the social structure also could be used. However, like most policy variables, social structural variables are on the district-level, so they cannot be specified for individual properties.

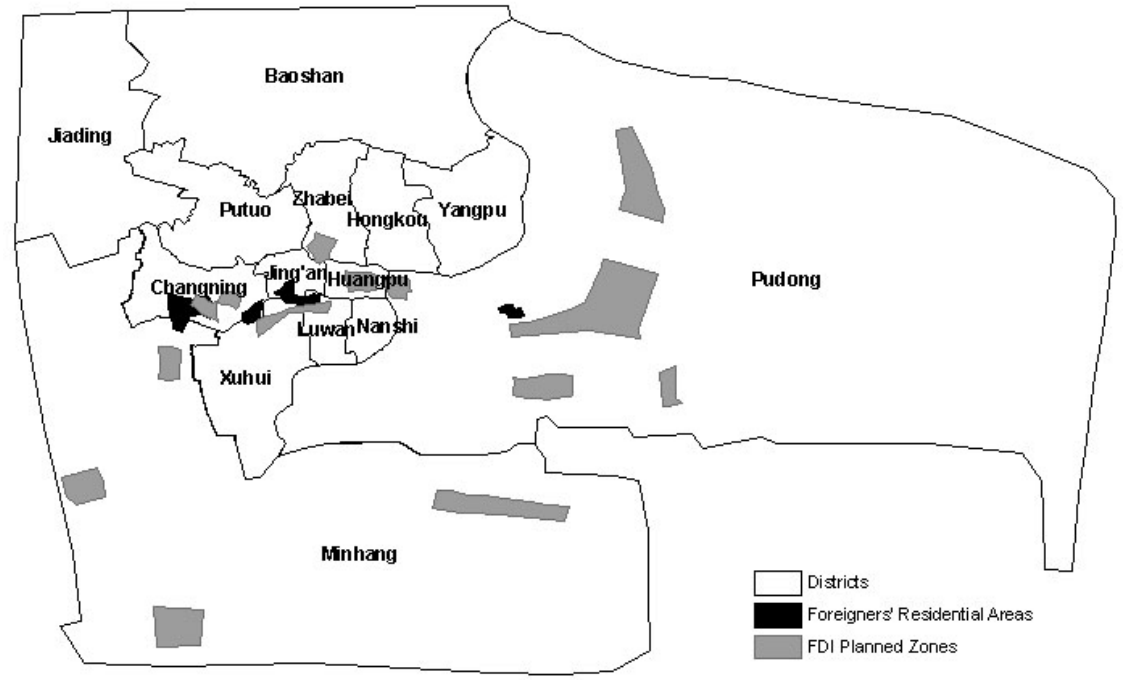
As represented in Map 6-2, two main new urban areas were built in Shanghai while there are many large-scale renewed urban areas. The location and other information about the new urban areas and renewed urban areas, as well as the location of FDI planned zones and foreigners' residential areas, are from the Shanghai Bureau of Statistics (1990-2004) and Shanghai Municipal Committee of Urban Development and Management (2004).

The locations of FDI planned zones and foreigners' residential areas are shown on Map 6-3. Among the FDI planned zones, Hongqiao (Changning district) is planned for convention, consulting, banking management, and other service functions. Caohejing Park (Minghang district), located in Shanghai's south-western region, is Shanghai's primary high-technology and research and development center. The Minhang area (Minghang district), 30 km south-west of central Shanghai, was also designated as a high technology zone in 1983. However it continues to have a strong base in heavy industry and to attract a high percentage of non-high-technology manufacturing ventures. The

Map 6-2 Newly-built and large-scale renewed urban areas



Map 6-3 FDI Planned Zones and Foreigners' residential areas



present FDI planned zones in the central city (for example, Waitan area) and Lujiazhu area in Pudong target capital-intensive firms in the service sector, such as finance and real estate, while other FDI planned zones in Pudong are designed for capital-intensive manufacturing firms and export-oriented firms. In terms of foreigners' residential areas, Changning includes the largest concentration of housing and ancillary services aimed at the resident foreign community. The Huaihai Road and Hengshan Road areas that are located at the border area of the Jing'an, Luwan, and Xuhui districts constitute the second largest community of foreigners. The Lujiazhu area is the third one.

This research assumes that the distance variables should have negative signs. All other characteristics should have positive effects on housing price.

1). City-wide Model

Hedonic modeling techniques can be used to examine the influences of FDI, economic transition and urban transformation on Shanghai's housing market. First, a hedonic model for the city-wide Shanghai housing market was run (Table 6-3). In order to do comparisons, this research adopts 0.05 and 0.1 significance thresholds.

In terms of the number of bedrooms, number of living rooms, and distance to shopping centers, this model is consistent with the hedonic models developed for Western cities (Edelstein 1974, Palm 1978, Linn 1983, Bajic 1985, Olmo 1995, Adair *et al.*1996, Orford 2000). From Table 6-3, the distance to FDI planned zones has a negative coefficient, which indicates that FDI has positive effects on housing price. Similarly, the negative coefficient of the distance to new urban areas means the construction of new urban areas will directly result in the higher price in the contiguous areas. However,

Table 6-3 Results of city-wide market hedonic price model

Variable	Coefficient	t value	P > | t |
Floor	0.7240	7.06	0.000
Lease-only rights	dropped		
Partial commodity rights	0.4547	0.39	0.699
Full commodity rights	0.9760	0.79	0.427
Number of bedrooms	16.5254	45.33	0.000
Number of living rooms	4.7144	6.16	0.000
Building type	0.4380	0.80	0.421
Distance to shopping centers (*km*)	-1.6870	-7.01	0.000
Distance to all open spaces (*km*)	0.7365	0.89	0.373
Distance to FDI planned zones (*km*)	-1.0444	-4.33	0.000
Distance to foreigner residential areas (*km*)	-0.1737	-1.30	0.193
Distance to all subway stations (*km*)	0.7471	1.61	0.107
Distance to newly-built urban areas (*km*)	-0.4801	-3.33	0.001
Distance to large-scale renewed urban areas (*km*)	-0.1836	-0.61	0.539
Distance to the major roads (*km*)	1.7375	1.84	0.066
Constant	-6.5362	-2.18	0.029
		F=203.03	R^2 = 0.6773

Note:
In this model, the distance to all open spaces and the distance to all subway stations instead of the distances to present facilities are used because planned facilities have similar effects on housing price as already-existing facilities. Peoples' expectations for the construction of new facilities may lead to the increase/decrease of housing price before the facilities are built.

it turns out that property right type, distance to foreigners' residential areas, and distance to large-scale renewed urban areas are not significant (Table 6-3), which is contradictory to our assumptions because we initially assumed that all the variables should be significant. The results of this model could lead us to conclude that these 3 indicators have no influences on housing price. This may be true for distance to foreigner residential areas and distance to large-scale renewed areas, but may not be true for property right type. From Table 6-4, it is clear that full commodity rights are associated with higher housing price while lease-only property rights are correlated with lower housing price. The reason why property right type is not significant is perhaps because they are all

dummy variables and their mean values are just marginally greater than their standard errors and this indicates that the effect of partial or full commodity rights on price is not significant different from that of lease-only rights.

Table 6-4 Property rights and housing price

Property rights	Mean of housing price (yuan)
Full commodity property rights	241,665
Partial property rights	172,430
Lease-only property rights	108,270

Moreover, the complexity of the urban housing market may cause the unexpected outcomes in the city-wide market model. Urban researchers state that the urban housing market consists of a series of linked, quasi-independent submarkets (Maclennan 1982, Orford 2000). The influences of FDI, economic transition and urban transformation may vary across the submarket. Therefore, it may be valuable to run hedonic models at a submarket level.

In a subsequent run of the city wide model, a dummy variable for district was included (Table 6-5). Two outcomes are meaningful. The first is that dummy5, dummy7, dummy11 are significant at the 0.05 level and dummy9 is significant at the 0.10 level. This suggests that the 5^{th}, 7^{th}, 11^{th} and 9^{th} submarkets are significant different from the 1^{st} submarket, which is the dropped one. The other is the coefficients and their significance change after introducing dummy variables. Both outcomes indicate the existence of submarkets. Therefore, we can safely base our next analyses on the assumption of the existence of submarkets.

2). District-based submarket models

As discussed in Chapter 3, the research first divided the housing market into several spatial submarkets based on administrative boundaries. Each spatial submarket was then

further subdivided by building type[36]. The outcomes are summarized in Appendix A (Table A-1 to Table A-16) and Table 6-6.

Table 6-5 Results of city-wide market hedonic price model

Variable	Coefficient	t value	P > | t |
Floor	0.6431	6.32	0.000
Lease-only rights	Dropped		
Partial commodity rights	0.1904	0.16	0.873
Full commodity rights	1.2041	0.96	0.339
Number of bedroom	16.5933	45.54	0.000
Number of living room	6.0720	7.61	0.000
Building type	0.8071	1.49	0.136
Distance to shopping centers (*km*)	-0.7651	-2.27	0.024
Distance to all open spaces (*km*)	1.2534	1.48	0.139
Distance to FDI planned zones (*km*)	-1.1258	-3.96	0.000
Distance to foreigner residential areas (*km*)	-0.0601	0.41	0.684
Distance to all subway stations (*km*)	0.2011	0.39	0.697
Distance to newly-built urban areas (*km*)	-0.3341	-1.69	0.091
Distance to large-scale renewed urban areas (*km*)	-0.2656	-0.70	0.481
Distance to the major roads (*km*)	0.6620	0.68	0.499
Dummy1	dropped		
Dummy2	2.9150	1.04	0.300
Dummy3	1.8940	0.76	0.446
Dummy4	0.3761	0.09	0.928
Dummy5	7.7218	2.69	0.007
Dummy6	3.5009	1.16	0.245
Dummy7	-6.5319	-2.42	0.016
Dummy8	2.0069	0.59	0.557
Dummy9	5.2258	1.82	0.068
Dummy10	1.2619	0.53	0.597
Dummy11	5.4753	2.04	0.041
Dummy12	2.7060	1.03	0.302
Dummy13	0.6419	0.24	0.813
Constant	-14.5303	-3.19	0.001
		F=125.30	$R^2 = 0.6911$

[36] There are 4 types of buildings in the database. Each dwelling unit belongs to only one of the building types.

Table 6-6 Summary of district-based submarket models

District	Building type	Significant variables
Baoshan	multi-rise	number of bedrooms (+), distance to major roads (+)
Changning	multi-rise	number of bedrooms (+), number of living rooms (+), full commodity rights (+)
Hongkou	high-rise	number of bedrooms (+), number of living rooms (+)
	multi-rise	number of bedrooms (+), number of living rooms (+)
Jing'an	new lane house	floor (+), number of bedrooms (+), distance to shopping centers (+)
	multi-rise	number of bedrooms (+), number of living rooms (+)
Luwan	multi-rise	number of living rooms (+)
Minghang	multi-rise	number of bedrooms (+), number of living rooms (+), distance to newly-built urban areas (-), Distance to foreigners' residential areas (+)
Pudong	multi-rise	number of bedrooms (+)
Putuo	multi-rise	number of bedrooms (+), number of living rooms (+), and distance to FDI planned zones (-)
	high-rise	number of bedrooms (+), number of living rooms (+), distance to FDI planned zones (-), distance to all open areas (-)
Xuhui	multi-rise	number of bedrooms (+), distance to foreigners' residential areas (+)
Yangpu	multi-rise	partial commodity rights(+), full commodity rights (+), number of bedrooms (+), number of living rooms (+), distance to open spaces (-), distance to major roads (+)
	high-rise	number of bedrooms (+), number of living rooms (+)
Zhabei	multi-rise	partial commodity rights(+), full commodity rights (+), number of bedrooms (+), number of living rooms (+), distance to newly-built urban areas* (-), distance to major roads (-)
New Huangpu	multi-rise	partial commodity rights (+), number of bedrooms (+), number of living rooms (+)

Note:
The variables marked with * means are significant only at 0.1 significance level.

This approach results in a total of 60 spatial structural submarket models. Of these 60, only 16 are worthy of further investigation. In 29 cases, there are too few observations for model calibration. In 15 other cases, the submarket models are not significantly different

from the city-wide model [37]. As revealed by Table 6-6, multi-rise building is the dominant building type in every submarket analyzed. This table also shows great variation exists among the submarket models, which indicates that joint spatial structural submarkets do exist. Specifically, foreign investment variables are significant in the Minghang, Putuo, and Xuhui multi-rise submarkets. Distance to FDI planned zones has a negative sign as expected while distance to foreigners' residential areas has positive sign that is not anticipated. Property right type is significant in Changning, Yangpu, Zhabei, and New Huangpu multi-rise submarkets. In addition, the construction of new urban areas influences housing price only in the Minghang (at 0.05 level) and Zhabei (at 0.1 level) multi-rise submarkets.

3). Price Surface-based submarket models:

The delimitation of spatial submarkets according to the administrative boundaries has many limitations. For example, the housing units located in a district may be actually far from the economic and culture centers of this district but near to the centers of another district. Households of these housing units may commute more often to the nearby center and the prices of these housing units may be affected more by the nearby center. Assigning housing units to submarkets based on administrative district may cause the coefficients of the submarket hedonic model to be biased and the hedonic model to not possess good explanation power.

In order to solve the problem, we could use a price surface to define the spatial submarket. The rationale is that since geographically nearby housing units are subject to similar influences of locational characteristics, they should show some pattern of price

[37] The F values are too small; Table 6-5 also suggests some submarket models may not be significant.

level. Moreover, housing price groups can be used to represent consumer groups because people having lower consumption power are not likely to purchase the property belonging to the higher price group. People having higher consumption power are also not likely to purchase the property of the lower price group because of social status considerations and the preference to live close to people sharing the same lifestyle. In this sense, spatial submarkets delimited by price surfaces actually correspond to different consumer groups. In addition, price surfaces can partially capture structural characteristics because houses close to one another and with similar structural characteristics usually have a similar selling price.

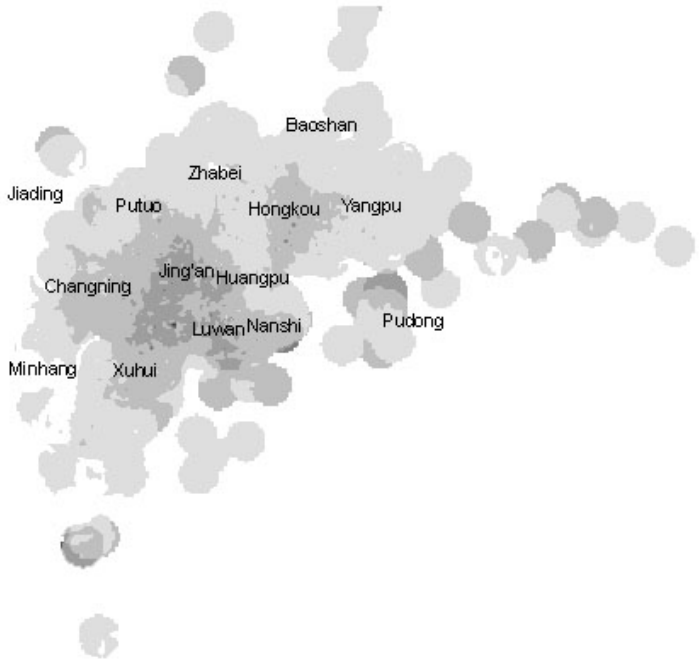
However, the housing transaction price must be standardized, which means we should use the average price of a housing unit rather than the total value[38] for price surface delimitation. Although it is ideal to use floor area to calculate the average price, this research determines the average price by dividing the housing price by the total number of bedrooms and living rooms. This is not only because the total floor area is unavailable, but also because Shanghai locals place more value on number of rooms than on the total floor area (Shanghai Bureau of Statistics 2001).

With the housing prices represented as a point feature, and using surface analysis in ArcGIS, we can generate a price surface that shows the continuous geographic distribution of housing prices. Specifically, we use kriging to generate the price surface. This interpolation method (kriging) consists of geostatistical methods that are based on statistical models that include autocorrelation (the statistical relationship among the measured points) (ArcGIS Desktop Help). The resulting price surface is continuous and has boundaries that help distinguish different price levels on a map (Map 6-4). Based on

[38] This is also the theoretic base for the sales comparison method used in real estate appraisal.

the price surface, we can delimit the housing submarket as shown in Map 6-5. The results for each price surface-based submarket are summarized in Appendix B (Table B-1 to Table B-8) and Table 6-7.

Map 6-4 Price Surface



Map 6-5 Housing submarket based on price surface

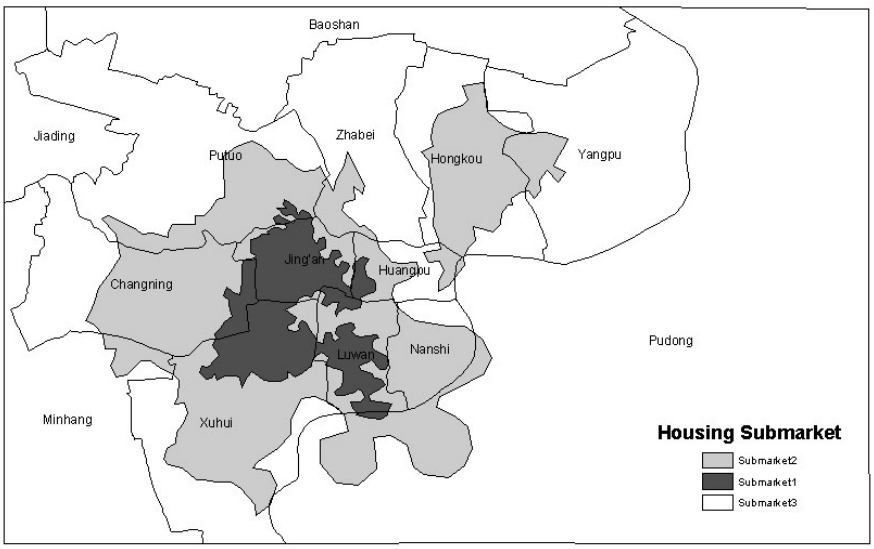


Table 6-7 Summary of price surface-based submarket models

Spatial	Structural	Significant variables
Core submarket	new lane house	Floor (+), number of bedrooms (+), distance to shopping centers (+), distance to FDI planned zones* (-), distance to foreigners' residential areas (-)
	multi-rise	number of bedrooms (+), number of living rooms* (+)
Middle submarket	old lane house	number of bedrooms (+), number of living rooms (+), partial commodity rights (-), distance to shopping centers (-), distance to FDI planned zones (+), distance to foreigners' residential areas* (-)
	new lane house	Floor* (+), number of bedrooms (+)
	high-rise	number of bedrooms (+), number of living rooms (+),distance to FDI planned zones (-), distance to major roads (+)
	multi-rise	number of bedrooms (+), number of living rooms (+), partial commodity rights (+), full commodity rights* (+), distance to foreigners' residential areas (-)
Peripheral submarket	high-rise	number of bedrooms (+), partial commodity rights * (+), distance to the major road * (+)
	multi-rise	Floor (+), number of bedrooms (+), number of living rooms (+), partial commodity rights (+), full commodity rights (+), distance to shopping centers (-), distance to FDI planned zones (-), distance to all subway stations* (+), distance to newly-built urban areas (-), distance to the major roads (+)

Note:
The variables marked with * means are significant only at 0.1 significance level.

Once again, Table 6-7 shows great variation exists among the submarket models. Specifically, distance to FDI planned zones is significant in the core new lane house (at 0.1 level), middle old lane house, middle high-rise apartment, middle multi-rise apartment, and peripheral multi-rise apartment submarkets, while distance to foreigners' residential areas is significant only in the middle old lane house (at 0.1 level), core new lane house, and middle multi-rise apartment submarkets. Property right type is significant in the peripheral high-rise apartment (at 0.1 level), middle old lane house, middle multi-rise apartment, and peripheral multi-rise apartment submarkets. In addition, the

construction of new urban areas significantly influences housing price only in the peripheral multi-rise submarket.

6.3 Result Analysis

This section provides a detailed discussion of the modeling results with respect to FDI, economic transition and urban transformation. Before proceeding, it is necessary to remark that negative signs on distance variables indicate positive effects on housing price, and vice versa.

1) FDI variables

In the city-wide model, distance to FDI planned zones has a significant and negative coefficient, which indicates that the farther the distance to the FDI-planned zones, the lower the housing price. This conforms to our expectations that foreign investment has positive effects on housing price and the result is also consistent to the observed effects of foreign investment. Moreover, distance to foreigners' residential areas has a negative sign in the city-wide model although it is not significant. This is encouraging because it indicates that although the effect is not statistically significant, distance to foreigners' residential areas has a positive influence on housing price at the city-wide level.

1a) District Submarkets

At the submarket level, however, foreign investment indicators exhibit various characteristics. Among the district-building type models, distance to FDI planned zones is significant and its effect is positive only in two models, Putuo high-rise and Putuo multi-rise (Table 6-6). Distance to foreigners' residential areas is significant in Minghang multi-rise and Xuhui multi-rise models (Table 6-6). However, the signs of distance to foreigners' residential areas in the two models are all positive which indicates a negative

impact, which is not what was expected. This problem will be explored later in this section.

The signs of the foreign investment indicators can be compared best in the multi-rise apartment models for all district submarkets since only these models have significant explanatory power in 12 of 16 district models (see Appendix A). For distance to FDI planned zones, the Baoshan, Hongkou, Minghang, Putuo, Yangpu, and Zhabei muti-rise models have negative coefficients, while the Changning, Jing'an, Luwan, Pudong, Xuhui, and New Huangpu have positive coefficients[39]. The results are represented on Map 6-6. It is clear that peripheral and northern districts have the negative coefficients while central and southern districts have the positive coefficients. Interestingly, the pattern of positive coefficients is similar to the geographical distribution of FDI planned zones (Map 6-3). Map 6-3 shows that most FDI planned zones are located in the central, southeast and southwest areas. This occurs because most of the employees of foreign invested companies are young people and new immigrants. These people and other young people who are employed by high-profile state work units comprise the majority of housing buyers (Shanghai Bureau of Statistics 2001). Distance to place of work places, i.e. FDI planned zones, is an important locational characteristic of housing for these employees. However, because the housing in central and southern Shanghai is expensive compared to that in the northern districts, most employees of foreign invested firms do not live in central and southern Shanghai. Also, the central and southern districts are the areas of the city occupied by work units and their employees. This places further pressure on housing in central and southern Shanghai. Therefore, the central and southern districts are not very attractive to young and affluent foreign company employees.

[39] Remember negative coefficients mean positive effects on price, and vice versa.

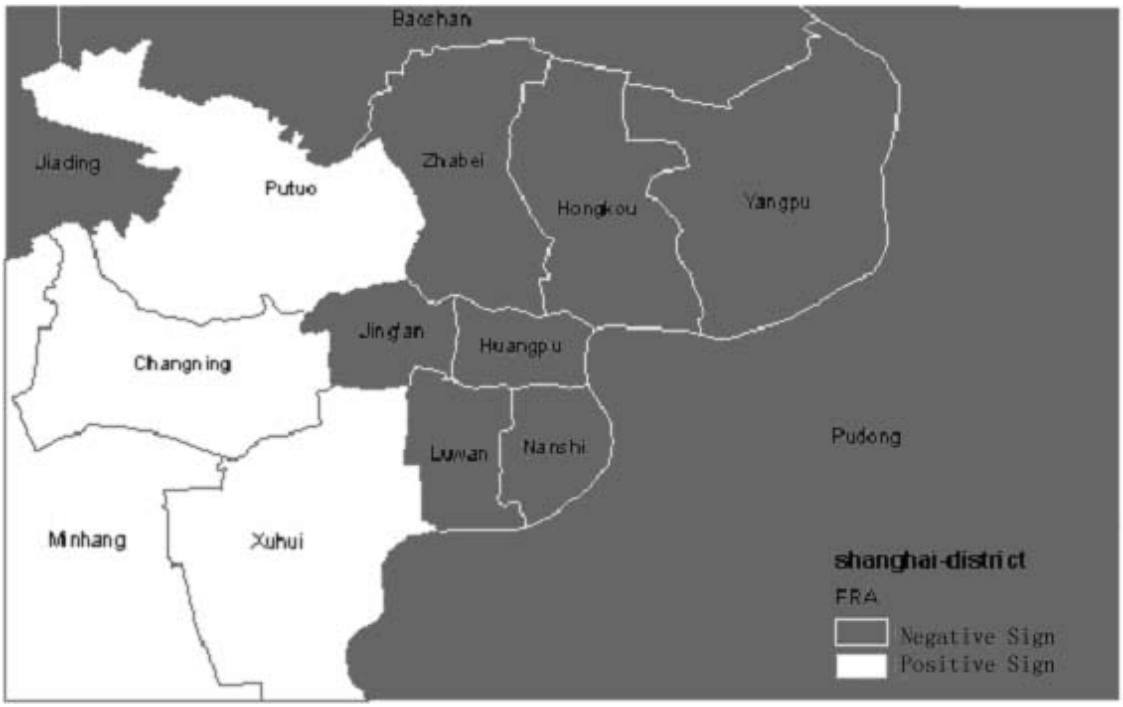
Regarding distance to foreigners' residential areas, Baoshan, Hongkou, Jing'an, Luwan, Pudong, Yangpu, Zhabei, and New Huangpu have negative coefficients, while Changning, Minghang, Putuo, and Xuhui have positive coefficients. Map 6-7 shows the geographical distribution of negative and positive coefficients. The districts with positive coefficients for foreigners' residential areas are all located in the western urban area. Once again, this pattern is like the geographical distribution of FRAs as shown in Map 6-3 - most FRAs are located in the western side of the city. This suggests that the FDI indicators exhibit unexpected effects (negative effects, positive signs) in districts where the FDI planned zones or FRAs are mainly located while they show the expected effect (positive effects, negative signs) in districts where FDI planned zones or FRAs are relatively sparse.

The combination of Map 6-6 and Map 6-7 indicates that both distance to FDI planned zones and distance to foreigners' residential areas have positive effects on price in the Zhabei, Hongkou, Baoshan, and Yangpu multi-rise submarkets, all of which are in the northern part of the city. This result further indicates the northern districts are particularly attractive to young people who have a decent income and seek a western lifestyle. On the other hand, distance to FDI planned zones and distance to foreigners' residential areas seem to have negative effects on the Changning and Xuhui multi-rise submarkets. The reason is, as indicated in last paragraph, Changning and Xuhui are the districts where FDI and foreigners are most likely to locate[40], households in the two districts do not have to compete for premium locations that are close to either FDIPZs or FRAs.

[40] Map 6-3 shows that Changning and Xuhui have 3 foreigners' residential areas, 75% of the total FRAs in Shanghai, one of which is the largest FRA in Shanghai.

Map 6-6 Effect of FDI Planned Zones

Map 6-7 Effect of Foreigners' Residential Areas



1b) Price Surface Submarkets

When using the price surface approach to delimit the spatial structural submarkets, the foreign investment indicators perform better. Distance to FDI planned zones is significant in the core new lane, middle old lane, middle high-rise, and peripheral multi-rise models (Table 6-7). However, in the middle old lane submarket, the coefficient is positive, which is unexpected. This may be because old lane houses are more likely subject to the effects of the old housing system[41]. Distance to foreigners' residential areas is significant and also has negative signs in core new lane, middle old lane, and middle multi-rise submarkets.

In order to compare the effects of foreign investment in different areas, we may look just at the foreign investment indicators in the multi-rise models of the three price surface submarkets. For distance to FDI planned zones, the core submarket and peripheral submarket have negative signs while the middle submarket has a positive sign. Like before, this is possibly because in the middle submarket, FDIPZs are not scarce resources for housing buyers, or possibly because the major buyers of the middle multi-rise submarket do not value distance to FDI planned zones (they are previous work unit employees, not the employees of foreign companies). Regarding distance to foreigners' residential areas, all the price surface multi-rise models have negative coefficients.

From the above analysis, it seems that foreign investment does affect housing prices in Shanghai, both city-wide and submarket level. Foreign companies and joint ventures provide effective demand for high-quality housing, which leads to positive effects on housing price. Foreign company employees, since they are young and most of them are

[41] The housing that was developed under the old housing system was sold to its residents not according to market principles.

new immigrants, comprise the majority of housing buyers (Shanghai Bureau of Statistics 2001). Therefore, their preferences for housing largely determine the specifications of hedonic housing price models, especially the foreign investment indicators in the models.

Meanwhile, the influences of the old housing system still exist. The unexpected performance of foreign investment indicators in some submarkets is mainly due to the influence of the old housing system. Work units and their employees occupy the majority of the central and southern parts of the city. The work units' employees comprise the low income group of Shanghai residents. Their limited financial resources mean that they are more likely to stay in the central city and have no incentive to move outwards. Therefore, they cannot be the major buyers in Shanghai's housing market. Moreover, this also implies that there are fewer housing transactions in the central city. The fact that the central city and old building submarkets are more subject to the influence of old system while peripheral and newer building submarkets are more market oriented results in the central districts and/or old building type models performing worse than peripheral districts and/or newer building type models in terms of conforming to the results of the theoretical analysis.

Another interesting result of the analysis is that foreign investment indicators do not have expected effects on housing prices in the submarkets where FDI and foreigners are most likely located. This result is reasonable because households will not compete for an attribute if the attribute is not scarce or exclusive. In addition, it is noticeable that submarkets have very different model specifications, which indicates that Shanghai's housing market is not homogenous and submarkets do exist. Furthermore, it seems that the price surface delimitation scheme performs better than the simple district subdivision

scheme because it generates models that better conform to our theoretical analysis and that are much easier to analyze.

2). Economic transition indicator

Property right type is not significant in the city-wide model. However, correlation analysis (Table 6-4) indicates that property right type has an effect on housing price. Higher housing price is associated with better property right type[42]. In addition, if we fit separate hedonic models for the 3 property right types (Appendix C), it is obvious that great differences exist between the models, which indicate that property right type affects people's preferences for housing characteristics, and therefore influences housing price.

In the district based submarket models, property right type is significant in the Changning multi-rise, Yangpu multi-rise, Zhabei multi-rise, and New Huangpu multi-rise models. The signs in these models are all positive as expected, which indicates property rights have positive effects on housing price. Like in the previous section, we may observe how the effects of property right type vary across space through comparing the signs of this variable in district multi-rise models. The comparison shows that property right type has a negative sign only in Xuhui and Minghang multi-rise apartment models. The underlining reason for the abnormal performance of the Xuhui and Minghang multi-rise apartment models is unclear. Taken together, the results of the comparison imply that property right type has a positive effect on housing price in the majority of the city.

As for the price surface-based submarkets, property right type is significant in the middle old lane, middle multi-rise, peripheral high-rise, and peripheral multi-rise models (Table 6-7). However, the sign of this variable in the middle old lane model is negative

[42] Full commodity property rights are preferable to partial commodity rights while lease-only rights are the least preferable property right type.

which contradicts our expectation. This result once again confirms that the transactions of old properties are less compatible with market principles and more constrained by the old housing system. Moreover, the above results indicate, generally, that outer urban areas and newer building types (multi-rise and high-rise apartments) are more subject to the impact of property right type.

Regardless of the significance, the signs of property right type in the core new lane, core multi-rise, middle old lane, and middle new lane models are negative while the signs in core new lane, middle high-rise, middle multi-rise, peripheral high-rise, and peripheral multi-rise models are positive. Together with the previous results, these results confirm that the operation of outer and newer submarkets is less affected by the old housing system and more influenced by market mechanisms. This is because the majority of high-rise and multi-rise apartments were built during last decade after privatization and located in the middle and peripheral areas. There apartments were mostly developed by commercial developers. Therefore, their original selling price and their resale price are more market-driven. On the other hand, the inner city and old building housing market is still heavily subject to the influence of the government. In this part of the housing market, most housing units were built before privatization. When these units were privatized, the selling prices were affected by many non-market factors (such as job rank and job seniority), so were the reselling prices. The intervention of government in household housing consumption is one important reason for unanticipated behaviors of some of the hedonic models.

In summary, although the city-wide model does not signify that property right type influences housing price, the submarket models show that property right type does affect

housing price, especially for newer housing and housing in the outer city. The result is as expected in a transitional economy. In Shanghai, old housing, such as old lane housing, is mostly located in central city area. During the housing reform, old housing was sold to employees by work units or the government at subsidized prices and the selling price and what type of property rights to be 'sold' were determined by work units and government usually based on institutional factors such as job rank and job seniority, not by the market. (also see section 5.2.6). On the other hand, in the outer city, the majority of the housing is newly-built commodity housing[43] and the price is determined by the market, not by work units and the government. Thus, households have to pay a premium for commodity property rights.

The different performances of property right type in the spatial structural models also reinforce the assumption that submarkets exist in the Shanghai housing market. Moreover, the above analysis implies that economic transition (housing reform) is one of the reasons contributing to market segmentation. In addition, an interesting and meaningful finding is that the hedonic models for different property right types (Appendix C) are significantly different. This finding suggests another submarket delimitation method, i.e. subdividing the market based on the housing property right type. This topic could be explored in later research.

---

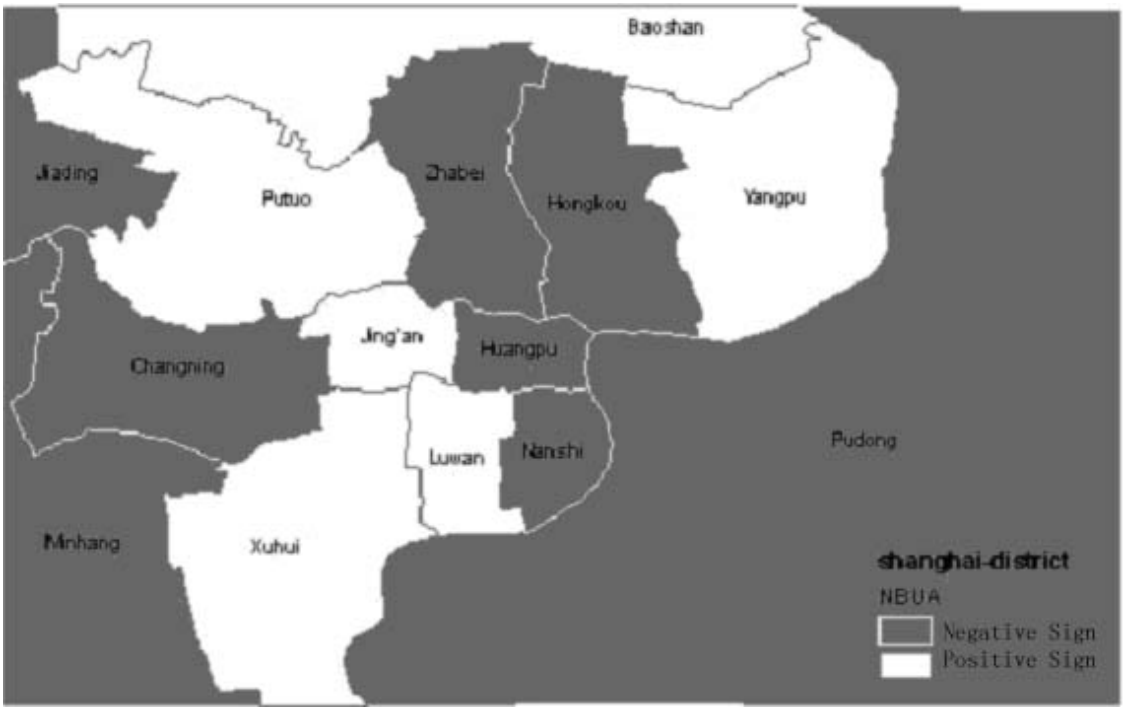
[43] Why does commodity housing cluster in the outer city? Redevelopment of old urban areas is very costly. Also, land assembly in the central city is difficult and involves much negotiation. As a result, commercial housing tends to cluster in certain areas of the city, particularly at the urban fringe.

3). Urban transformation indicators

For the city-wide model, the distance to newly-built urban areas has the anticipated effect on housing price. The negative coefficient of distance to newly-built urban areas means the construction of new urban areas results in higher housing prices in these regions. In addition, distance to large-scale renewed urban areas has a negative sign in the city-wide model as expected although it is not significant. This result implies that households' house-shopping decisions may not be affected by urban renovation programs as much as is supposed.

In the district-based submarket models, distance to newly-built urban areas is significant only in the Minghang multi-rise and Zhabei multi-rise models. The signs are negative as expected. As before, the research compares the signs of this variable in spatial multi-rise models. The Baoshan multi-rise, Jing'an multi-rise, Luwan multi-rise, Putuo multi-rise, Xuhui multi-rise, and Yangpu multi-rise models have distance to newly-built urban areas with positive signs. Mapping this result on Map 6-8 and comparing Map 5-8 with Map 6-2 (the distribution of newly-built urban areas) does not provide further information about how the distribution of newly-built urban areas affects the performance of this variable in hedonic models. As for the distance to large-scale renewed urban areas, this variable is not significant in all district-based models. The comparison of the geographical distribution of the effects (Map 6-9) with the distribution of large-scale renewed urban areas (Map 6-2) leads to encouraging findings. The large-scale renewed urban areas have negative coefficients in the districts where the large-scale renewed urban areas are located and positive coefficients in other districts. This finding bolsters

Map 6-8 Effects of newly-built urban areas



Map 6-9 Effects of large-scale renewed urban areas

the hypothesis that large-scale renewed urban areas may cause housing price increases in contiguous areas while leading to a decrease in prices further away.

Among price surface-based models, distance to newly-built urban areas is significant and negatively signed in the peripheral multi-rise apartment model, while distance to large-scale renewed urban areas is not significant for any submarket. Regardless of the significance of the variables, distance to newly-built urban areas has a negative sign in all spatial multi-rise apartment models, which indicates that the construction of new urban areas has a positive effect on housing price. This corresponds to the result of the city-wide model. This positive effect is especially noticeable in the area adjacent to the newly-built urban areas, in this case, the peripheral submarket. As for distance to large-scale renewed urban areas, this variable is not significant in all price surface multi-rise models. In terms of the sign of the variable, it is negative in the core and peripheral submarkets while positive in middle submarket, which is in accordance with the finding that large-scale renewed urban areas have a positive effect on the areas where large-scale renewed urban areas are located.

In summary, the analysis of the newly-built urban areas' effect on housing price is not very encouraging in district-based submarket models. This is mostly because the two newly-built urban areas are far from all districts. Therefore, a reasonable conclusion is that the positive effects of newly-built urban areas do not extend extensively across space; the adjacent areas are subject to the greatest (significant) influence from the newly-built urban areas. This supposition is supported by the results of the price surface-based submarket models.

The investigation of large-scale renewed urban areas gives consistent results even when using different submarket subdivision schemes. Large-scale renewed urban areas may cause the housing price to increase in contiguous areas while leading to a decrease in areas further away. The theoretical analysis also supports this supposition. The adjacent areas are better off because renovation benefits nearby areas most, while the farther areas are worse off.

In summary, although the construction of new urban areas may benefit the whole city, the renovation of old urban areas benefits some areas and hurts other areas. This fact gives incentives to market players to influence urban planning that results in urban construction and urban renovation (for example, the Shanghai city/district government is usually under pressure from developers to modify detailed plans). Comparing the two market subdivision schemes, price surface schemes appear superior to district schemes. For instance, the price surface schemes generate fewer submarkets; the results of the price surface schemes are easier to interpret; and these schemes produce results that better correspond to the results of theoretical analysis.

4). Conclusion

The city-wide model confirms our hypotheses about the influences of FDI, economic transition and urban transformation on housing price. Foreign investment and urban transformation are both significant variables in the city-wide model, and the signs of the variables are as expected. Although the economic transition variable, i.e. property right type, is not significant in the city-wide market's hedonic model, it is highly correlated with housing price and thus its effect cannot be denied (Table 6-4).

When looking at the submarket level, FDI, economic transition and urban transformation are significant in some but not all submarkets. This fact on one hand implies that the effects of FDI, economic transition and urban transformation on housing price are unevenly distributed, and on the other hand suggests that Shanghai's urban housing market is segmented and the submarket assumption is valid. In general, the closer to the central city and the older the housing, the less influence FDI, economic transition and urban transformation have. Still, the modeling results are not perfectly satisfying. The signs of many indicators in the hedonic models are contradictory to our expectation, which is probably caused by the multicentric characteristic of Shanghai's urban spatial structure, the errors introduced during the data processing process, housing distribution system, and more important, the transitioning housing system.

Two different schemes are used to subdivide the urban housing market. Generally speaking, the results of the two schemes are similar. However, since the sample size is relatively small, dividing the dataset into many subsets may decrease the credibility of the resulting models because each model is then fitted on a relatively small sample. This may be why in the district spatial models many variables behave other than as expected. This fact, plus that the district-based modeling scheme generates more models and complicates the analysis, make the price surface-based modeling scheme more attractive. The analysis also indicates that subdividing Shanghai's urban housing market into spatial-property right type submarkets might be another good alternative. This scheme is supported by the fact that different property right types coexist in the market, and the housing price is highly correlated with or influenced by its property right type, but that is a topic for future research.

To sum up, the quantitative analysis generally, though not perfectly, supports our hypotheses on the effects of FDI, economic transition and urban transformation on housing price and submarkets. In the urban housing market of transforming Shanghai, FDI, economic transition and urban transformation impose impacts on housing price even though the degrees of the impacts vary across space and building types. At the same time, FDI, economic transition and urban transformation also contribute to the segmentation of the housing market through differentiating households' demands for housing characteristics[44].

[44] FDI, economic transition and urban transformation have introduced new housing characteristics that many households will take into account when they make house-buying decisions.

Chapter 7 Conclusion

In this research, the influence of economic transition, foreign investment, and urban transformation on Shanghai's urban housing market is investigated. Shanghai is selected because of its uniqueness, i.e. its integration into the world economy, its unparalleled economic status in China and its recent change in spatial and social structure. There is no better place than Shanghai for examining the influences of economic transition, foreign investment and urban transformation on urban housing markets in China. Moreover, since Shanghai is the most developed city in China, it serves as a development model for other Chinese cities - what has happened and is happening in Shanghai will more or less influence the development of other Chinese cities. Therefore, studying Shanghai is a crucial for understanding what is going on and what will be going on in most Chinese cities.

This research demonstrates how FDI, economic transition and urban transformation impact the Shanghai housing market. FDI, economic transition and urban transformation have introduced new market players into the housing market. These new players have in turn affected the structure of the housing market in Shanghai. Moreover, the research shows that, in Shanghai's urban housing market, the introduction of new players has altered the relationships between more traditional players in fundamental ways (Wu 2003). For example, the government, while still a powerful player in the market, is no longer an all-powerful player in the market. New alliances have also been formed such as those linking financial intermediaries and developers. It is also the case that certain groups have very little power in the market. This is particularly the case for low income households and immigrants to Shanghai. Finally, there exist issues of social justice in the

housing market. For example, government, armed with legislation and charged with the responsibility for urban development and distribution for the benefit of the public, is failing to assist the poor. The failure to act appears to stem from their pursuit of short-sighted interests while compromising their social responsibilities.

Through theoretical analysis, it is evident that economic transition has caused variations in housing price through improving infrastructure, changing planning, fiscal and taxation policies, privatizing housing, and restructuring property rights; the urban housing market is also influenced by foreign investment. Foreign investment creates the jobs and attracts domestic capital into Shanghai, which creates more jobs. More jobs mean more workers and more demand for housing. In addition, foreign investors provide development capital to real estate developers. Thus foreign investment results in more jobs and more capital that helps in the development of Shanghai's housing market and creates a ripple effect on housing price. In addition, economic transition and foreign investment caused the transformation of urban form which directly affects housing price. The quantitative analysis not only verifies that FDI, economic transition and urban transformation affect the housing price but also shows that influences are uneven across space and housing types. In general, the outer city and newer housing types are more affected by FDI, economic transition and urban transformation, as well as by the market, while the old housing system still affects the inner city and old housing types.

The various specifications of hedonic models indicate that Shanghai's urban housing market is composed of several quasi-independent submarkets. This research uses two different ways to subdivide urban housing market, i.e. district-building type method and price surface-building type method. Generally, the two methods lead to similar results.

However, since the price surface-building type scheme simplifies the outcomes and facilitates the analysis, this delimitation scheme seems preferable.

This study is significant in that first, it helps people better understand the effects of FDI, economic transition and urban transformation on housing price. Through qualitative and quantitative analysis, the study answered the question: *What are the impacts of economic transition, foreign investment and urban transformation (UT) on housing price?* Previous literature rarely has paid attention to this question and thus it was not well investigated before. In addition, the submarket portion of the research enriches people's knowledge of how to delimit submarkets. It may help answer the question: *What is the best way to define submarkets?* Moreover, this research systematically investigated the market structure and players of a transitional economy's housing market, especially with respect to Shanghai. The research identified the important components of a transitional economy's housing market structure, the major players in the market, the roles and relationships of these players, and the influences of FDI, economic transition and urban transformation on the market structure and players. Previous researches only addressed either market structure or market players and thus were incomplete.

In terms of methodology, the integration of FDI, economic transition and urban transformation in hedonic price models to quantitatively analyze their effects is pioneering work. The application of hedonic price models to a transitional economy is also new. Almost all the housing price literature is with respect to the urban housing market in Western developed countries. Wu (2002a, 2002b) first employed the hedonic modeling technique to investigate the housing market in China, a developing transitional economy, but he only considered the impacts of house's structural characteristics on price,

which was an obvious mistake because location is another crucial factor determining housing price[45]. My research corrects his oversight by introducing locational factors. Finally, this research provides a general research framework for studying the influence of FDI, economic transition and urban transformation on housing markets.

However, there are many things that need to be improved in further study. The first is associated with the functional form of the hedonic model. In this study, only a classic function form was adopted. Therefore, it is really hard to say whether this model perfectly fits Shanghai's housing market. Other forms of hedonic model should be tried in order to be able to do a cross-model comparison. Only after the comparison, can we decide if this functional form is the best one for Shanghai's housing market. The second is associated with the indicators of FDI, economic transition and urban transformation. The models used selected indicators of FDI, economic transition and urban transformation but in reality, other indicators of FDI, economic transition and urban transformation also have effects. For example, like property right types, financial policy also signifies an aspect of economic transition. Moreover, the models assumes only the distances to FDI planned zones, foreign residential areas, newly-built urban areas and large-scale renewed urban areas matter while in fact, the magnitudes of the zones and the areas are also important for determining housing price. A better model would employ more indicators. The last improvement is associated with the delimitation of submarkets. The two schemes used for subdividing the urban housing market probably over-bound the submarkets and thus might be one of the reasons for some of the unexpected results.

[45] It is well-known in real estate industry that three factors determine property value, "location, location, and location".

Future study might subdivide the housing market into submarkets of even smaller scale to get better results.

Appendix A: Hedonic models of district-building type submarkets

Table A-1 Baoshan, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.6164	1.33	0.192
Number of bedrooms	6.9934	4.69	0.000
Number of living rooms	1.0095	0.51	0.616
Lease-only rights	Dropped		
Partial commodity rights	1.9251	0.47	0.640
Full commodity rights	2.4414	0.63	0.532
Distance to shopping centers (*km*)	-0.5175	-0.55	0.582
Distance to all open spaces (*km*)	-0.2919	-0.16	0.872
Distance to FDI planned zones (*km*)	-0.7483	0.57	0.574
Distance to foreigners' residential areas (*km*)	-2.7376	-1.58	0.123
Distance to all subway stations (*km*)	-1.4427	-1.42	0.164
Distance to newly-built urban areas (*km*)	0.2666	0.37	0.715
Distance to large-scale renewed urban areas (*km*)	1.2582	1.13	0.265
Distance to the major roads (*km*)	6.4485	3.15	0.003
Constant	9.7382	0.75	0.457
	Obs=52	F=6.48	R^2 = 0.6892

Table A-2 Changing, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.1194	0.42	0.677
Number of bedrooms	8.3878	9.24	0.000
Number of living rooms	9.8022	8.23	0.000
Lease-only rights	Dropped		
Partial commodity rights	1.5524	0.94	0.348
Full commodity rights	5.4556	2.82	0.006
Distance to shopping centers (*km*)	-1.2811	-0.82	0.416
Distance to all open spaces (*km*)	-3.6792	-1.10	0.274
Distance to FDI planned zones (*km*)	1.7030	0.66	0.508
Distance to foreigners' residential areas (*km*)	0.7465	0.34	0.734
Distance to all subway stations (*km*)	1.7838	0.78	0.440
Distance to newly-built urban areas (*km*)	-2.6105	-1.40	0.163
Distance to large-scale renewed urban areas (*km*)	-1.7553	-1.33	0.186
Distance to the major roads (*km*)	-9.9618	-1.54	0.126
Constant	40.8271	1.61	0.110
	Obs=123	F=30.16	R^2 = 0.7825

Table A-3 Hongkou, High-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.5906	0.99	0.345
Number of bedrooms	15.5863	2.29	0.043
Number of living rooms	15.4789	2.36	0.038
Lease-only rights	Dropped		
Partial commodity rights	-9.3115	-0.96	0.357
Full commodity rights	Dropped		
Distance to shopping centers (*km*)	2.1592	0.17	0.871
Distance to all open spaces (*km*)	-7.8203	-0.39	0.702
Distance to FDI planned zones (*km*)	-1.2715	-0.04	0.969
Distance to foreigners' residential areas (*km*)	-9.8589	-0.25	0.811
Distance to all subway stations (*km*)	6.0324	0.27	0.795
Distance to newly-built urban areas (*km*)	-16.4039	-0.75	0.471
Distance to large-scale renewed urban areas (*km*)	-11.2570	-0.40	0.696
Distance to the major roads (*km*)	30.3561	0.80	0.443
Constant	244.588	0.98	0.348
	Obs=24	F=3.49	$R^2 = 0.7921$

Table A-4 Hongkou, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.3523	0.91	0.367
Number of bedrooms	8.1743	6.98	0.000
Number of living rooms	5.0509	3.27	0.002
Lease-only rights	Dropped		
Partial commodity rights	2.6512	1.00	0.323
Full commodity rights	3.1790	1.38	0.173
Distance to shopping centers (*km*)	0.1912	0.12	0.906
Distance to all open spaces (*km*)	-0.0592	-0.02	0.983
Distance to FDI planned zones (*km*)	-1.7589	-0.81	0.422
Distance to foreigners' residential areas (*km*)	0.7873	0.31	0.761
Distance to all subway stations (*km*)	2.1946	0.76	0.449
Distance to newly-built urban areas (*km*)	-0.7458	-0.24	0.808
Distance to large-scale renewed urban areas (*km*)	0.0425	0.01	0.989
Distance to the major roads (*km*)	0.5579	0.08	0.936
Constant	2.3706	0.06	0.955
	Obs=78	F=11.98	$R^2 = 0.7087$

Table A-5 Jing'an, New lane house

Variable	Coefficient	t value	P > | t |
Floor	11.4503	2.76	0.012
Number of bedrooms	20.0800	9.01	0.000
Number of living rooms	12.2614	0.54	0.596
Lease-only rights	Dropped		
Partial commodity rights	Dropped		
Full commodity rights	-0.9400	-0.05	0.961
Distance to shopping centers (*km*)	55.8380	2.47	0.022
Distance to all open spaces (*km*)	13.7807	0.57	0.578
Distance to FDI planned zones (*km*)	-9.9505	-0.79	0.440
Distance to foreigners' residential areas (*km*)	-8.0265	-0.24	0.812
Distance to all subway stations (*km*)	3.8909	0.16	0.873
Distance to newly-built urban areas (*km*)	-5.8103	-0.24	0.810
Distance to large-scale renewed urban areas (*km*)	-11.1021	-0.78	0.443
Distance to the major roads (*km*)	40.3986	0.41	0.685
Constant	39.7620	0.13	0.897
	Obs=33	F=22.61	R^2 = 0.9314

Table A-6 Jing'an, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.0569	0.10	0.921
Number of bedrooms	9.6594	6.52	0.000
Number of living rooms	7.2464	2.65	0.013
Lease-only rights	Dropped		
Partial commodity rights	3.8569	1.27	0.214
Full commodity rights	4.2868	1.35	0.186
Distance to shopping centers (*km*)	2.5557	0.59	0.558
Distance to all open spaces (*km*)	-5.7469	-0.90	0.376
Distance to FDI planned zones (*km*)	0.2183	0.11	0.912
Distance to foreigners' residential areas (*km*)	-8.0783	-0.91	0.368
Distance to all subway stations (*km*)	-0.0039	0.00	0.999
Distance to newly-built urban areas (*km*)	1.3720	0.19	0.848
Distance to large-scale renewed urban areas (*km*)	0.0494	0.01	0.991
Distance to the major roads (*km*)	-3.7979	-0.29	0.773
Constant	-11.4294	-0.12	0.907
	Obs=45	F=8.29	R^2 =0.7766

Table A-7 Luwan, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	-0.7976	-0.80	0.428
Number of bedrooms	5.5115	1.89	0.070
Number of living rooms	14.8910	2.68	0.012
Lease-only rights	Dropped		
Partial commodity rights	0.8477	0.20	0.847
Full commodity rights	8.2779	1.21	0.238
Distance to shopping centers (*km*)	1.9515	0.05	0.958
Distance to all open spaces (*km*)	4.1968	0.71	0.481
Distance to FDI planned zones (*km*)	0.3512	0.01	0.991
Distance to foreigners' residential areas (*km*)	-1.0686	-1.12	0.272
Distance to all subway stations (*km*)	-4.1912	-0.40	0.690
Distance to newly-built urban areas (*km*)	2.9769	0.26	0.798
Distance to large-scale renewed urban areas (*km*)	-1.7457	-0.52	0.606
Distance to the major roads (*km*)	32.5975	1.68	0.105
Constant	-26.7966	-0.17	0.863
	Obs=42	F=6.92	R^2=0.7627

Table A-8 Minghang, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.5118	1.60	0.112
Number of bedrooms	5.5687	6.49	0.000
Number of living rooms	6.5702	4.22	0.000
Lease-only rights	Dropped		
Partial commodity rights	-3.7250	-0.86	0.391
Full commodity rights	-1.3946	-0.31	0.755
Distance to shopping centers (*km*)	-2.3817	-0.97	0.336
Distance to all open spaces (*km*)	-0.2040	-0.17	0.867
Distance to FDI planned zones (*km*)	-0.1508	-0.19	0.850
Distance to foreigners' residential areas (*km*)	0.5807	3.08	0.003
Distance to all subway stations (*km*)	-0.7571	-0.71	0.479
Distance to newly-built urban areas (*km*)	-0.6151	-3.33	0.001
Distance to large-scale renewed urban areas (*km*)	1.2395	0.43	0.667
Distance to the major roads (*km*)	2.4515	1.63	0.106
Constant	14.1475	1.92	0.057
	Obs=128	F=16.92	R^2=0.6586

Table A-9 Pudong, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	-0.1098	-0.69	0.493
Number of bedrooms	4.5546	7.93	0.000
Number of living rooms	1.3318	1.67	0.100
Lease-only rights	Dropped		
Partial commodity rights	1.2615	1.04	0.305
Full commodity rights	1.6825	1.39	0.169
Distance to shopping centers (*km*)	-0.3236	-0.80	0.425
Distance to all open spaces (*km*)	-0.2657	-0.42	0.676
Distance to FDI planned zones (*km*)	0.2341	0.61	0.543
Distance to foreigners' residential areas (*km*)	-0.1661	-1.46	0.150
Distance to all subway stations (*km*)	0.4706	0.63	0.530
Distance to newly-built urban areas (*km*)	-0.0489	-0.18	0.861
Distance to large-scale renewed urban areas (*km*)	0.0208	0.09	0.930
Distance to the major roads (*km*)	-0.2194	-0.28	0.777
Constant	3.4136	0.79	0.435
	Obs=69	F=6.47	R^2 =0.6045

Table A-10 Putuo, High-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.1785	0.72	0.476
Number of bedrooms	12.6701	3.33	0.002
Number of living rooms	8.7873	3.02	0.005
Lease-only rights	Dropped		
Partial commodity rights	0.3194	0.08	0.933
Full commodity rights	Dropped		
Distance to shopping centers (*km*)	2.1429	1.02	0.315
Distance to all open spaces (*km*)	-11.5810	-2.50	0.018
Distance to FDI planned zones (*km*)	-9.7606	-3.38	0.002
Distance to foreigners' residential areas (*km*)	0.4617	1.55	0.132
Distance to all subway stations (*km*)	4.4797	1.38	0.177
Distance to newly-built urban areas (*km*)	4.9680	1.45	0.156
Distance to large-scale renewed urban areas (*km*)	2.5318	0.44	0.662
Distance to the major roads (*km*)	-13.8705	-0.95	0.35
Constant	-68.6655	-1.41	0.168
	Obs=44	F=7.39	R^2 =0.7409

Table A-11 Putuo, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.1054	0.51	0.614
Number of bedrooms	7.7971	10.25	0.000
Number of living rooms	7.7216	8.10	0.000
Lease-only rights	Dropped		
Partial commodity rights	2.4530	1.38	0.169
Full commodity rights	1.6083	0.94	0.350
Distance to shopping centers (*km*)	-0.4234	-0.66	0.513
Distance to all open spaces (*km*)	2.4561	1.36	0.175
Distance to FDI planned zones (*km*)	-3.0763	-2.49	0.014
Distance to foreigners' residential areas (*km*)	0.0794	0.63	0.528
Distance to all subway stations (*km*)	0.1706	0.13	0.900
Distance to newly-built urban areas (*km*)	1.5222	1.38	0.168
Distance to large-scale renewed urban areas (*km*)	-0.5904	-0.37	0.711
Distance to the major roads (*km*)	5.5966	1.16	0.248
Constant	-22.6545	-1.37	0.173
	Obs=219	F=24.63	R^2=0.6097

Table A-12 Xuhui, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	-0.3053	-0.56	0.574
Number of bedrooms	28.2837	38.58	0.000
Number of living rooms	4.2327	1.38	0.170
Lease-only rights	Dropped		
Partial commodity rights	-4.3827	-1.20	0.235
Full commodity rights	-0.8413	-0.18	0.855
Distance to shopping centers (*km*)	1.0804	0.46	0.646
Distance to all open spaces (*km*)	-4.0259	-0.93	0.355
Distance to FDI planned zones (*km*)	1.4986	0.32	0.753
Distance to foreigners' residential areas (*km*)	2.0516	2.42	0.017
Distance to all subway stations (*km*)	-0.9945	-0.22	0.829
Distance to newly-built urban areas (*km*)	3.6761	0.82	0.413
Distance to large-scale renewed urban areas (*km*)	0.7115	0.28	0.780
Distance to the major roads (*km*)	-21.0582	-1.90	0.060
Constant	-70.5523	-1.30	0.197
	Obs=103	F=155.53	R^2=0.9578

Table A-13 Yangpu, High-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	-0.4448	-1.21	0.251
Number of bedrooms	12.3598	3.08	0.011
Number of living rooms	18.3822	3.65	0.004
Lease-only rights	Dropped		
Partial commodity rights	0.6187	0.12	0.910
Full commodity rights	Dropped		
Distance to shopping centers (*km*)	-9.2400	-1.44	0.177
Distance to all open spaces (*km*)	-6.9721	-0.84	0.419
Distance to FDI planned zones (*km*)	4.0102	0.41	0.692
Distance to foreigners' residential areas (*km*)	-9.3518	-1.18	0.263
Distance to all subway stations (*km*)	6.3469	1.04	0.321
Distance to newly-built urban areas (*km*)	-2.0153	-0.10	0.921
Distance to large-scale renewed urban areas (*km*)	-10.0687	-0.47	0.645
Distance to the major roads (*km*)	35.7978	2.00	0.071
Constant	106.7104	0.38	0.708
	Obs=24	F=8.49	R^2 = 0.9025

Table A-14 Yangpu, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	-0.1472	-0.90	0.370
Number of bedrooms	5.6013	8.94	0.000
Number of living rooms	6.7828	8.33	0.000
Lease-only rights	Dropped		
Partial commodity rights	2.9404	3.12	0.002
Full commodity rights	6.1265	5.99	0.000
Distance to shopping centers (*km*)	-0.3658	-0.35	0.726
Distance to all open spaces (*km*)	-1.8812	-2.00	0.048
Distance to FDI planned zones (*km*)	-0.6700	-0.54	0.590
Distance to foreigners' residential areas (*km*)	-0.0492	-0.14	0.888
Distance to all subway stations (*km*)	-0.5277	-0.53	0.597
Distance to newly-built urban areas (*km*)	1.8552	0.90	0.371
Distance to large-scale renewed urban areas (*km*)	1.5568	0.76	0.449
Distance to the major roads (*km*)	5.3845	1.99	0.049
Constant	-18.3259	-0.69	0.495
	Obs=124	F=28.74	R^2 =0.7726

Table A-15 Zhabei, Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	0.1150	0.70	0.489
Number of bedrooms	6.0297	8.05	0.000
Number of living rooms	4.9284	4.93	0.000
Lease-only rights	Dropped		
Partial commodity rights	3.6465	2.41	0.021
Full commodity rights	5.7530	3.79	0.001
Distance to shopping centers (*km*)	3.2105	1.14	0.260
Distance to all open spaces (*km*)	-1.5319	-1.05	0.301
Distance to FDI planned zones (*km*)	0.0686	0.03	0.977
Distance to foreigners' residential areas (*km*)	-3.8265	-1.52	0.136
Distance to all subway stations (*km*)	2.0931	1.27	0.213
Distance to newly-built urban areas (*km*)	-2.0606	-1.92	0.062
Distance to large-scale renewed urban areas (*km*)	-1.8080	-0.96	0.345
Distance to the major roads (*km*)	-8.6873	-1.99	0.053
Constant	41.2624	1.99	0.054
	Obs=53	F=17.63	R^2=0.8556

Table A-16 New Huangpu[46], Multi-rise apartment

Variable	Coefficient	t value	P > | t |
Floor	-0.7816	-0.95	0.360
Number of bedrooms	6.5422	2.76	0.015
Number of living rooms	10.0664	2.79	0.014
Lease-only rights	Dropped		
Partial commodity rights	5.8803	2.43	0.029
Full commodity rights	0.8078	0.11	0.913
Distance to shopping centers (*km*)	-3.7448	-0.89	0.386
Distance to all open spaces (*km*)	-2.2876	-0.53	0.605
Distance to FDI planned zones (*km*)	-1.1248	-0.27	0.788
Distance to foreigners' residential areas (*km*)	-0.2787	-0.95	0.360
Distance to all subway stations (*km*)	-2.0056	-0.48	0.636
Distance to newly-built urban areas (*km*)	-2.9715	-1.02	0.325
Distance to large-scale renewed urban areas (*km*)	-1.7711	-0.41	0.689
Distance to the major roads (*km*)	-2.2212	-0.16	0.878
Constant	51.0148	1.12	0.283
	obs=28	F=4.70	R^2 = 0.8134

[46] Nanshi District and the old Huangpu District were combined in July, 2000. The new district is named Huangpu District. This research uses New Huangpu to distinguish it from the old Huangpu district.

Appendix B: Hedonic models of price surface-based submarkets

Table B-1 Core surface-New Lane Apartments

Variable	Coefficient	t value	P > | t |
Floor	11.5995	3.45	0.002
Number of bedrooms	18.4894	10.11	0.000
Number of living rooms	19.1760	1.09	0.285
Lease-only rights	Dropped		
Partial commodity rights	10.7300	0.52	0.604
Full commodity rights	-1.6155	-0.10	0.924
Distance to shopping centers (*km*)	48.4601	3.05	0.005
Distance to all open spaces (*km*)	16.1511	1.09	0.284
Distance to FDI planned zones (*km*)	-15.7426	-1.86	0.072
Distance to foreigners' residential areas (*km*)	-27.3477	-2.27	0.030
Distance to all subway stations (*km*)	1.5832	0.11	0.911
Distance to newly-built urban areas (*km*)	5.6298	1.36	0.183
Distance to large-scale renewed urban areas (*km*)	-10.6933	-1.08	0.288
Distance to the major roads (*km*)	19.9581	0.33	0.743
Constant	-102.1035	-1.61	0.117
	Obs=45	F=27.36	R^2 = 0.9198

Table B-2 Core surface-Multi-rise apartments

Variable	Coefficient	t value	P > | t |
Floor	-0.3603	-0.49	0.624
Number of bedrooms	28.3209	33.22	0.000
Number of living rooms	9.3033	1.78	0.081
Lease-only rights	Dropped		
Partial commodity rights	-5.0211	-1.01	0.319
Full commodity rights	-6.9288	-1.10	0.276
Distance to shopping centers (*km*)	3.4957	0.38	0.703
Distance to all open spaces (*km*)	-4.7442	-0.79	0.434
Distance to FDI planned zones (*km*)	-1.8051	-0.47	0.642
Distance to foreigners' residential areas (*km*)	-2.7825	-0.37	0.715
Distance to all subway stations (*km*)	2.7377	0.39	0.695
Distance to newly-built urban areas (*km*)	-0.6976	-0.50	0.617
Distance to large-scale renewed urban areas (*km*)	-1.4339	-0.33	0.740
Distance to the major roads (*km*)	-39.6054	-1.63	0.109
Constant	-6.2110	-0.30	0.763
	Obs=75	F=135.57	R^2 = 0.9665

Table B-3 Middle surface-Old lane house

Variable	Coefficient	t value	P > | t |
Floor	0.3080	0.46	0.656
Number of bedrooms	3.2280	4.47	0.002
Number of living rooms	7.5303	3.95	0.003
Lease-only rights	dropped		
Partial commodity rights	-5.7617	-2.38	0.041
Full commodity rights	dropped		
Distance to shopping centers (*km*)	-3.6036	-2.96	0.016
Distance to all open spaces (*km*)	-2.6135	-1.19	0.265
Distance to FDI planned zones (*km*)	5.7979	3.44	0.007
Distance to foreigners' residential areas (*km*)	-1.8484	-1.91	0.088
Distance to all subway stations (*km*)	-0.3948	-0.19	0.852
Distance to newly-built urban areas (*km*)	0.4663	1.14	0.282
Distance to large-scale renewed urban areas (*km*)	2.5690	1.16	0.276
Distance to the major roads (*km*)	13.5830	1.83	0.101
Constant	-1.9843	-0.30	0.772
	Obs=22	F=16.44	R^2 = 0.9564

Table B-4 Middle surface-new lane house

Variable	Coefficient	t value	P > | t |
Floor	6.8548	1.97	0.085
Number of bedrooms	13.7387	6.63	0.000
Number of living rooms	5.3653	0.99	0.351
Lease-only rights	dropped		
Partial commodity rights	-6.0358	-0.54	0.607
Full commodity rights	dropped		
Distance to shopping centers (*km*)	4.6227	0.85	0.422
Distance to all open spaces (*km*)	2.0570	0.13	0.900
Distance to FDI planned zones (*km*)	-2.6183	-0.39	0.703
Distance to foreigners' residential areas (*km*)	-1.1645	-0.34	0.742
Distance to all subway stations (*km*)	2.66403	0.14	0.892
Distance to newly-built urban areas (*km*)	-1.5649	-0.55	0.600
Distance to large-scale renewed urban areas (*km*)	-11.1394	-1.52	0.168
Distance to the major roads (*km*)	26.7451	1.34	0.217
Constant	3.6640	0.09	0.928
	Obs=21	F=34.81	R^2= 0.9812

Table B-5 Middle surface-high-rise apartments

Variable	Coefficient	t value	P > | t |
Floor	0.2649	1.21	0.230
Number of bedrooms	13.3812	5.12	0.000
Number of living rooms	13.7821	4.92	0.000
Lease-only rights	Dropped		
Partial commodity rights	4.6860	1.36	0.176
Full commodity rights	dropped		
Distance to shopping centers (*km*)	-2.2720	-1.28	0.203
Distance to all open spaces (*km*)	-5.6664	-1.23	0.223
Distance to FDI planned zones (*km*)	-5.3405	-2.23	0.028
Distance to foreigners' residential areas (*km*)	2.1084	1.24	0.220
Distance to all subway stations (*km*)	4.3168	0.79	0.430
Distance to newly-built urban areas (*km*)	-0.7439	-1.10	0.274
Distance to large-scale renewed urban areas (*km*)	-0.9839	-0.51	0.613
Distance to the major roads (*km*)	24.1118	2.04	0.045
Constant	2.1044	0.15	0.880
	Obs=95	F=10.94	R^2 = 0.6155

Table B-6 Middle surface-multi-rise apartments

Variable	Coefficient	t value	P > | t |
Floor	-0.0375	-0.21	0.835
Number of bedrooms	9.3514	14.64	0.000
Number of living rooms	8.9640	11.39	0.000
Lease-only rights	dropped		
Partial commodity rights	3.7055	3.12	0.002
Full commodity rights	1.9481	1.80	0.072
Distance to shopping centers (*km*)	-0.6730	-1.39	0.164
Distance to all open spaces (*km*)	-0.1217	-0.10	0.917
Distance to FDI planned zones (*km*)	0.7990	0.97	0.334
Distance to foreigners' residential areas (*km*)	-1.3538	-2.48	0.014
Distance to all subway stations (*km*)	-0.2825	-0.26	0.794
Distance to newly-built urban areas (*km*)	-0.2466	-1.31	0.192
Distance to large-scale renewed urban areas (*km*)	0.5229	1.08	0.283
Distance to the major roads (*km*)	-2.3942	-0.77	0.442
Constant	3.1338	0.91	0.363
	Obs=389	F=54.49	R^2 = 0.6538

Table B-7 Peripheral Surface-high-rise apartments

Variable	Coefficient	t value	P > | t |
Floor	-0.0728	-0.36	0.720
Number of bedrooms	10.9451	4.21	0.000
Number of living rooms	5.3736	1.45	0.154
Lease-only rights	Dropped		
Partial commodity rights	4.7493	1.82	0.076
Full commodity rights	Dropped		
Distance to shopping centers (*km*)	0.8971	0.86	0.394
Distance to all open spaces (*km*)	0.2086	0.07	0.941
Distance to FDI planned zones (*km*)	-1.1332	-1.24	0.222
Distance to foreigners' residential areas (*km*)	0.4363	0.45	0.657
Distance to all subway stations (*km*)	-0.5431	-0.28	0.785
Distance to newly-built urban areas (*km*)	-0.3466	-0.48	0.634
Distance to large-scale renewed urban areas (*km*)	-0.6450	-0.57	0.573
Distance to the major roads (*km*)	11.0792	1.87	0.069
Constant	-0.2317	-0.02	0.986
	Obs=50	F=5.38	$R^2 = 0.6356$

Table B-8 Peripheral Surface-multi-rise apartments

Variable	Coefficient	t value	P > | t |
Floor	0.2831	2.71	0.007
Number of bedrooms	6.4401	19.55	0.000
Number of living rooms	4.1640	9.55	0.000
Lease-only rights	Dropped		
Partial commodity rights	4.2729	5.59	0.000
Full commodity rights	2.6605	3.59	0.000
Distance to shopping centers (*km*)	-0.7348	-6.79	0.000
Distance to all open spaces (*km*)	-0.5930	-1.46	0.145
Distance to FDI planned zones (*km*)	-0.3224	-2.27	0.024
Distance to foreigners' residential areas (*km*)	-0.1324	-0.92	0.359
Distance to all subway stations (*km*)	0.3764	1.81	0.070
Distance to newly-built urban areas (*km*)	-0.2914	-3.99	0.000
Distance to large-scale renewed urban areas (*km*)	-0.1820	-1.10	0.272
Distance to the major roads (*km*)	1.8816	4.20	0.000
Constant	4.0516	2.70	0.007
	Obs=600	F=78.31	$R^2 = 0.6347$

Appendix C: Hedonic models of different property right types

Table C-1 Results of hedonic price model- right type 1 (lease-only type)

Variable	Coefficient	t value	P > | t |
Floor	0.1493	0.71	0.480
Number of bedrooms	5.3306	12.47	0.000
Number of living rooms	4.3840	3.21	0.001
Building type	0.3721	1.69	0.092
Distance to shopping centers (*km*)	-1.6758	-5.80	0.000
Distance to all open spaces (*km*)	-0.8964	-1.33	0.186
Distance to FDI planned zones (*km*)	-0.1925	-0.68	0.500
Distance to all subway stations (*km*)	1.4957	3.01	0.003
Distance to foreigners' residential areas (*km*)	-0.5270	-4.32	0.000
Distance to newly-built urban areas (*km*)	-0.3270	-1.92	0.056
Distance to large-scale renewed urban areas (*km*)	-0.5530	-1.75	0.081
Distance to the major roads (*km*)	3.1460	2.92	0.004
Constant	-3.3330	-1.10	0.270
		F=32.23	$R^2 = 0.5826$

Table C-2 Results of hedonic price model-right type 2

Variable	Coefficient	t value	P > | t |
Floor	0.3965	2.09	0.037
Number of bedrooms	22.7863	39.31	0.000
Number of living rooms	1.6741	1.28	0.202
Building type	2.7914	1.38	0.169
Distance to shopping centers (*km*)	-1.3364	-3.40	0.001
Distance to all open spaces (*km*)	1.1817	0.90	0.370
Distance to FDI planned zones (*km*)	-0.9554	-2.36	0.019
Distance to all subway stations (*km*)	0.5340	0.70	0.482
Distance to foreigners' residential areas (*km*)	0.4573	1.57	0.117
Distance to newly-built urban areas (*km*)	-0.1807	-0.83	0.405
Distance to large-scale renewed urban areas (*km*)	0.1500	0.34	0.734
Distance to the major roads (*km*)	-0.0722	-0.05	0.959
Constant	-31.18807	-3.42	0.001
		F=141.87	$R^2 = 0.8025$

Table C-3 Results of hedonic price model-right type 3

Variable	Coefficient	t value	P > | t |
Floor	0.6797	4.65	0.000
Number of bedrooms	13.8742	25.42	0.000
Number of living rooms	7.0104	6.91	0.000
Building type	-4.1107	-3.04	0.002
Distance to shopping centers (*km*)	-1.5699	-4.42	0.000
Distance to all open spaces (*km*)	0.4188	0.32	0.750
Distance to FDI planned zones (*km*)	-1.1025	-3.06	0.002
Distance to foreigners' residential areas (*km*)	-0.2537	-1.46	0.144
Distance to all subway stations (*km*)	1.1448	1.66	0.096
Distance to newly-built urban areas (*km*)	-0.7807	-3.55	0.000
Distance to large-scale renewed urban areas (*km*)	-0.9429	-1.95	0.052
Distance to the major roads (*km*)	3.1435	2.05	0.041
Constant	-20.9453	3.12	0.002
		F=101.30	$R^2 = 0.6572$

Table C-4 Significant and insignificant variables of the three models

Property right model 1	Significant variables	1. Number of bedrooms; 2. Number of living rooms; 3. Building type; 4. Distance to shopping centers; 5. Distance to all subway stations; 6. Distance to foreigners' residential areas; 7. Distance to newly-built urban areas; 8. Distance to large-scale renewed urban areas; 9. Distance to the major roads
	Insignificant variables	1. Floor; 2. Distance to all open spaces; 3. Distance to FDI planned zones
Property right model 2	Significant variables	1. Number of bedrooms; 2. Distance to shopping centers; 3. Distance to FDI planned zones
	Insignificant variables	1. Floor; 2. Number of living rooms; 3. Building type; 4. Distance to all open spaces; 5. Distance to all subway stations; 6. Distance to foreigners' residential areas; 7. Distance to newly-built urban areas; 8. Distance to large-scale renewed urban areas; 9. Distance to the major roads
Property right model 3	Significant variables	1. Floor; 2. Number of bedrooms; 3. Number of living rooms 4. Building type; 5. Distance to shopping centers; 6. Distance to FDI planned zones; 7. Distance to all subway stations; 8. Distance to newly-built urban areas; 9. Distance to large-scale renewed urban areas; 10. Distance to the major roads
	Insignificant variables	1. Distance to all open spaces; 2. Distance to foreigners' residential areas

References:

Adair A. S., BerryJ. N., Deddis W. G. 1998. Barriers to data sharing in the surveying profession: implications for the commercial property market. *Journal of Property Research* 15: 331–346

Adair A. S., Berry J. N., McGreal W. S., 1994. Investment and private sector residential development in inner-city Dublin. *Journal of Property Valuation and Investment* 12: 47-56

——. 1996, Hedonic modelling, housing submarkets, and residential valuation. Journal *of Property Research* 13: 67-84

——. 2000. The financing of urban regeneration. *Land Use Policy* 17: 147–156

Adair A. S., Berry J. N., McGreal W. S., Sykora L., Parsa A. G., and Redding B. 1999. Globalization of real estate markets in central Europe. *European Planning Studies* 7: 295–305

Alain D. L. 1987. Land and housing in Third World cities---are public and private strategies contradictory? *Cities* 4(4): 325-338

Allen M. T., Springer T. M., Waller N. G., 1995. Implicit pricing across residential submarkets. *Journal of Real Estate and Financial Economics* 11:137-151

Anselin L. 1988. Spatial Econometrics: Methods and Models. Dordrecht: Kluwer Academic

Arimah B.C., 1994. The income elasticity of demand in a sub-Saharan African housing market: evidence from Ibadan, Nigeria. *Environment and Planning A* 26: 107-119

Ash A., 2002. Spatialities of globalization. *Environment and Planning A* 34: 385-399

Atkinson S. E., Crocker T. D. 1992. The exchangeability of hedonic property price studies. *Journal of Regional Science* 32(2): 169-183

Bajic V., 1985. Housing-market segmentation and demand for housing attributes: some empirical findings. *AREUEA Journal* 13: 58-75

Ball M. 1983. *Housing Policy and Economic Power*. London: Methuen

Ball M., Kirwan R., 1977. Accessibility and supply constraints in the urban housing market. *Urban Studies* 14:11-32

Baross P. 1983. The articulation of land supply for popular settlements in Third World cities. In *Land For Housing The Poor*, Shlomo A., Raymon A., Sidihijai T. and Emiel W. (eds) Singapore: Selectbooks

Batley, R. 1982. Urban renewal and expulsion in Sao Paulo, in Gilber A. *et al.* (eds). *Urbanization in Contemporary Latin America*, pp. 231-262. Wiley: Chichester

Baxter R., Anthony J., 1971. The first stage in disaggregating the residential sub-model. Land Use and Built Form Studies: Cambridge

Beaverstock J. V. 1996. Revisiting high-waged labour market demand in the global cities: British professional and managerial workers in New York City. *International Journal of Urban and Regional Research* 20: 422-445

Berry J., McGreal S., Stevenson S., Young J., 2001. Government intervention and impact on the housing market in Greater Dublin. *Housing Studies* 16: 755-769

Bian Y., Logan J., 1996. Market transition and the persistence of power: the changing stratification system in urban China. *American Sociological Review* 61(5): 739-759

Bourassa S. C., Hamelink F., Hoesli M., MacGregory B., 1999. Defining housing submarkets. *Journal of Housing Economics* 8: 160-183

Bourne L. S., Simmons J., 1978. On the spatial structure of housing submarkets. Paper presented at the 74th Annual Meeting of the AAG.

Bowen W. M., Mikelbank B. A., Perstegaard E. M. 2001. Theoretical and empirical considerations regarding space in hedonic housing price model applications. *Growth and Change* 32(4): 466-490

Bramley G., 1993. Land-use planning and the housing market in Britain: the impact on housebuilding and house prices. *Environment and Planning A* 25: 1021-1051

Can A., 1990. The measurement of neighborhood dynamics in urban house prices. *Economic Geography* 66: 254-272

Case D. D., Grove T. Apted C. 1990. The community's toolbox: The idea, methods and tools for participatory assessment, monitoring and evaluation in community forestry. http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/x5307e/x5307e08.htm

Chen A. 1998. China's urban housing market development: problems and prospects. *Journal of Contemporary China* 7(17): 43-60

Chen, C., L. Chang and Y. Zhang. 1995. The role of foreign direct investment in China's post-1978 economic development. *World Development*. 23: 691-703

Chen X., Parish W. L. 1996. Urbanization in China: reassessing and evolving model. In *The Urban Transformation of the Developing World*. 1996. Josef G. (*eds*). Oxford University Press, New York

Dale-Johnson D., 1982. An alternative approach to housing market segmentation using hedonic price data. *Journal of Urban Economics* 11: 311-332

Dicken P., 1992. Global Shift: The Internationalization of economic activity. New York. Guilford Press

Dubin R.A., 1992. Spatial autocorrelation and neighborhood quality. *Regional Science and Urban Economics* 22: 433-452

Doebele W. A. 1983. The provision of land for the urban poor: concepts, instruments and prospects. In *Land For Housing The Poor*, Shlomo A., Raymon A., Sidihijai T. and Emiel W. (eds) Singapore: Selectbooks

——. 1994. Chapter Four: Urban land and macroeconomic development. In *Methodology for Land and Housing Market Analysis,* Gareth J. & Peter M. W. (*eds*.) Lincoln Institute of Land Policy: Cambridge, Massachusetts

Dowall D.E. 1993. Establishing urban land markets in the People's Republic of China. *Journal of the American Planning Association* 59(2):182-192

Edelstein R., 1974. The determinants of value in the Philadelphia housing market: a case study of the main line 1967-1989. *The Review of Economics and Statistics* 56: 319-328

Eng I. and Lin Y. 1996. Seeking competitive advantage in an emergent open economy: foreign direct investment in Chinese industry. *Environment and Planning A* 28(6): 1113-1139

Enzo M., 1987. The urban question in socialist developing countries. In *The Socialist Third World---Urban Development and Territorial Planning*. Dean F. and Nigel T. (*eds)*. Basil Blackwell Ltd: Oxford, UK

Evans A. W., 1995. The property market: ninety percent efficient? *Urban Studies* 32: 5-29

Fang K., Zhang Y. 2003. Plan and market mismatch: urban redevelopment in Beijing during a period of transition. *Asia Pacific Viewpoint* 44(2): 149-162

Feldstein M.S. 1982. Inflation, tax rules and investment: some economic evidence. *Econometrica* 50: 825-892

Friedmann J. 1986. The world city hypothesis. *Development and Change* 17: 69-83

Fung K. K. and Forrest R., 2002. Institutional mediation, the Hong Kong residential housing market and the Asian financial crisis. *Housing Studies* 17(2): 189-207

Gabriel S. 1984. A note on housing market segmentation in an Israeli development town. *Urban Studies* 21: 189-194

Gaubatz P. 1999. China's urban transformation: patterns and processes of morphological change in Beijing, Shanghai and Guangzhou. *Urban Studies* 36(9): 1495-1522

Goodman A. C. 1981. Housing submarkets within urban areas: definitions and evidence. *Journal of Regional Science* 21(2): 175-185

Goodman J. L., Ittner J. B., 1992. The accuracy of home owners' estimates of house value. *Journal of Regional Science* 21(2): 175-185

Goodman A. C., Kaiwai M., 1986. Functional form, sample selection, and housing demand. *Journal of Urban Economics* 20: 155-167

Goodman A. C., Thibodeau T. G., 1998. Housing market segmentation. *Journal of Housing Economics* 7: 121-143

Giussani B., Hadjimatheou G., 1992. House prices: an econometric model for the UK, *Netherlands Journal of Housing and the Built Environment* 7: 31–58

Grigsby W., Lizieri C. and Macgregor B. D., 1987. The dynamics of neighborhood change and decline. Progress in Planning 28(1): 1-76

Guo W.G. 2000. The brief study on the 50-year relationship between central government and local government. *Journal of Fujian Provincial CCP School* 3: 26-30

Haila A. 2000. Real estate in global cities: Singapore and Hong Kong as property states. *Urban Studies* 37(12): 2241-2256

Halvorsen R., 1981. Choice of functional form for hedonic price equation. *Journal of Urban Economics* 10: 37-49

Han S. S. 2000. Shanghai between state and market in urban transformation. *Urban Studies* 37(11): 2091-2112

Han S. S., Wang Y. 2003. The institutional structure of a property market in inland China: Chongqing. *Urban Studies* 1(40): 91-113

Han Z. 2005. Let common people enjoy the fruits of reform. Renming Net: unn.people.com.cn/GB/14748/3249670.html

Hancock K. 1991. The determination of housing submarkets: case studies using Scottish data. unpublished paper, Centre for Housing Research, University of Glasgow, Glasgow

Hancock K., Maclennan D., 1989. House price monitoring systems and housing planning in Scotland: a feasibility study. *A report for the Scottish Office*, Centre for Housing Research, University of Glasgow, Glasgow

Harloe M., Marcuse P., Smith N., 1992. Housing for people, housing for profits. *Divided Cities*: *NewYork and London in the Contemporary World*. Blackwell. Oxford

Harvey D., 1982. *The Limits of Capital*. Oxford: Blackwell

---------. 1985. *The Urbanization of Capital*. Oxford: Blackwell

---------. 1989. *The Urban Experience. Baltimore*: Johns Hopkins University Press

Healey P., 1992. Urban regeneration and the development industry. *Regional Studies* 25(2): 97-110

---------. 1998. Institutionalist theory, social exclusion and governance. in Madanipour A., Cars G. and Allen J. (eds.) Social Exclusion in European Cities: pp.53-73. London: Jessica Kingsley

Healey P., Barrett S., 1990. Structure and agency in land and property development processes: some ideas for research. *Urban Studies* 27 (1): 89-104

Hill S., Munday M. 1995. Foreign manufacturing investment in France and the UK: a regional analysis of locational determinants, *Tijdschrift voor Economische en Sociale Geografie* 86: 311-327

Ho L. S., Tsui K. Y. 1996. Fiscal relations between Shanghai and the central government. In: Y. M. Yeung and Y. W. Sung (eds.) *Shanghai*: 153–169. Hong Kong: The Chinese University Press

Hsing Y. 1996. Blood, thicken than water: Interpersonal relations and Taiwanese investment in southern China. *Environment & Planning A* 28(12): 2241-2262

Huang Y. 2003. A room of one's own: housing consumption and residential crowding in transitional urban China. *Environment and Planning A*. vol. 35: 591-614

---------. 2004. Housing markets, government behaviors, and housing choice: a case study of three cities in China. *Environment and Planning A* 36: 45-68

Huang Y. Clark W.A.V. 2002. Housing tenure choice in transitional urban China: a multilevel analysis. *Urban Studies* 39: 7-32

Johnston R. J. 1976. Spatial and temporal variation in land and property prices in New Zealand: 1953-1972. *New Zealand Geographer* 32(1): 30-55

Kauko T. 2001. Combining theoretical approaches: the case of urban land value and housing market dynamics. *Housing, Theory and Society* 18: 167-173

Keivani R., Parsa A., McGreal S., 2001. Globalisation, institutional structures and real estate markets in Central European Cities. *Urban Studies* 38: 2457-2476

Keng C. W. K., 1996. China's land disposition system. *Journal of Contemporary China* 5(13): 325-345

Kitzinger J., Barbour R. S. 1999. Introduction: the challenge and promise of focus groups, in: R. S. Barbour and J. Kitzinger (eds.) *Developing Focus Group Research. Politics, Theory and Practice*, pp. 1–20. London: Sage Publications.

Knox P. L. 1995. *Urban Social Geography: An Introduction*. London: Routledge

Kueh, Y. 1992. Foreign investment and economic change in China. *The China Quarterly*. 131: 637-690

Kumssa A., Jones J. F., 1999. The social consequences of reform in transitional economics. *International Journal of Social Economics* 26 (1/2/3): 194-210

Lanegran D.A., Palm R. 1978. Land values, housing prices, and housing shortages. In *An Introduction to Geography (2nd edition)*. Lanegran D. A, Palm R. (eds). McGraw Hill: New York

Lancaster K. 1966. A new approach to consumer theory. *Journal of Political Economy* 74: 132-157

Leung C. K. 1993. Personal contracts, subcontracting linkages, and development in the Hong Kong-Zhujiang Delta region. *Annals of the Association of American Geographers* 83(2): 272-303

Li L. H. 2003. Economic reform in the urban land system in China. *Journal of Contemporary China* 12(34): 207-224

Li S. 2000. The housing market and tenure decision in Chinese cities: a multivariate analysis of the case of Guangzhou. *Housing Studies* 15: 213-236

Li S., Siu Y., 2001. Residential mobility and urban restructuring under market transition. *Professional Geographer* 53: 219-229

Lin G. C. S. 2001. Metropolitan development in a transitional socialist economy: spatial restructuring in the Pearl River Delta, China. *Urban Studies* 38(3): 383-406

Linn, J. F. 1983. *Cities in the Developing World: Policies for their Equitable and Efficient Growth*. Oxford University Press: Oxford

Linneman P. 1980. Some empirical results on the nature of the hedonic price function for the urban housing market. *Journal of Urban Economics* 8: 47-68

Lipscomb C. 2003. Small cities matter, too: the impacts of an airport and local infrastructure on housing prices in a small urban city. *Review of Urban and Regional Development Studies* 15(3): 255-273

Lo F., Marcotullio P., 2000. Globalisation and urban transformations in the Asia-Pacific region: a review. *Urban Studies* 37: 77-111

Logan J. R. 1991. Gambling on real estate: limited rationality in the global economy. *Sociological Perspectives* 34(4): 391-401

---------. 1993. Cycles and trends in the globalization of real estate. in: P. Knox (*eds*.) *The Restless Urban Landscape*: 35-54. Englewood Cliffs, NJ: Prentice-Hall

Logan J. R., Molotch H., 1987. *Urban Fortunes: the Political Economy of Place*. Berkeley: University of California Press

Ma L. J. C. 2002. Urban transformation in China, 1949-2000: a review and research agenda. *Environment and Planning A* 34: 1545-1569

Maclennan D., 1982. *Housing economics: An applied approach: Longman*. Harlow, Essex

Maclennan D., Munro M., Wood G., 1987. Housing choice and the structure of urban housing markets. *Between State and Market Housing in the Post-industrial Era*: Almquist and Hicksell International. Gothenburg

Maclennan D., Tu Y. 1996. Economic perspectives on the structure of local housing markets. *Housing Studies* 11: 387-406

Mao S.L. 2004. The past and the future of the Chinese government reform. Zhidu Fenxi Wang (institutional analysis network). http://www.wiapp.org/

Maucuse P., van Kempen R. 2000. *Globalizing Cities: a New Spatial Order?* Oxford: Blackwell

Michaels R., Smith V. K. 1990. Market segmentation and valuing amenities with hedonic models: the case of hazardous waste sites. *Journal of Urban Economics* 28: 223-242

Munro M. 1986. Testing for segmentation in the private housing market in Glasgow. DP 8, Centre for Housing Research: University of Glasgow, Glasgow

National Bureau of Statistics of China (NBSC). 2004. Statistics Reports of Year 2003. http://www.stats.gov.cn/

Nee V., 1989. The emergence of a market society: changing mechanisms of stratification in China. *American Journal of Sociology* 101(4): 908-950

Nelson, J. 1979. *Access to Power: Politics and the Urban Poor in Developing Nations*. Princeton University Press: Princeton N.J.

Olmo J. C., 1995. Spatial estimation of housing prices and locational rents. *Urban Studies* 32: 1331-1344

Ong S., Sing T., 2002. Price discovery between private and public housing markets. *Urban Studies* 39: 56-67

Orford S. 1999. Valuing the Built Environment: GIS and House Price Analysis. Ashgate: Aldershot, Hants

Orford S., 2000. Modelling spatial structures in local housing market dynamics: A multilevel perspective. *Urban Studies* 37: 1643-1671

Parsa A. R., Keivani R. M. 1999. Development of real estate markets in Central Europe: the case of Prague, Warsaw, and Budapest. *Environment and Planning A* 31(8): 1383-1399

Pacione M., 2001. Urban Geography: A Global Perspective. Routledge: New York

Palm R., 1978. Spatial segmentation of the urban housing market. *Economic Geography* 54: 210-221

---------. 1991. Chapter IV: Hedonic Methods. In *Measuring the Demand for Environmental Quality*. Braden J. B., Charles D. K. (eds.) Elsevier Science Publishers: B.V. North-Holland

Peter M. W. 1989. Land Values and valorization processes in Latin American Cities: a research agenda. *Bulletin of Latin American Research*. 8(1): 47-66

Peter M. W., Edith J., Gareth J. 1994. Measuring residential land-price changes and affordability. In *Methodology for Land and Housing Market Analysis*. Gareth J. and Peter M. W. (eds). Lincoln Institute of Land Policy: Cambridge, Massachusetts

Pichler-Milanovich N., 2001. Urban housing markets in Central and Eastern Europe: Convergence, divergence or policy 'collapse'. *European Journal of Housing Policy* 1(2): 145-187

Pye L. W. 1981. Foreword. In: C. Howe (eds.) *Shanghai: Revolution and Development in Asia*: pp. xi–xvi. New York: Cambridge University Press.

Qian Y. 2000. The process of China's market transition (1978-1998): the evolutionary, historical, and comparative perspectives. *Journal of Institutional and Theoretical Economics* 156: 153-171

Rakodi C., 1994. Applying a political-economy approach to land and housing markets in Zimbabwe. *Methodology for land and housing market analysis*: 70-87. Lincoln Institute of Land Policy: Cambridge, MA

Rana P. B., 1995. Reform strategies in transitional economies: Lessons from Asia. *World Development* 23: 1157-1169

Rosen S. 1974. Hedonic pries and implicit markets: product differentiation in pure competition. *The Journal of Political Economy* 82(1): 34-55

Rothenberg J., Galster G. C., Butler R. V., and Pitkin J. R., 1991. The Maze of Urban Housing Market. Chicago: University of Chicago Press.

Roweis S. T. and Scott A.J.,1981. The urban land question. In Dear M. and Scott A. J. (eds.) *Urbanization and Urban Planning in Capitalist Society*. Methuen, London

Safier M., 2001. Transforming Shanghai: landscapes of turbo-dynamic development in China's 'world city'. *City* 5: 67-75

Sassen, S. 1991. *The global city: New York, London, Tokyo*. Princeton, N.J.: Princeton University Press

Schnare A., Struyk R., 1976. Segmentation in urban housing markets. *Journal of Urban Economics* 3: 146-166

Shanghai Bureau of Statistics, 1999-2001. *Shanghai Real Estate Year Book (1990-2001)*. Shanghai Bureau of Statistics: Shanghai

--------, 2000. *Shanghai Statistical Year Book (2000)*. Shanghai Bureau of Statistics: Shanghai

Shanghai Municipal Committee of Urban Development and Management. 2004. *Shanghai's Urban Construction and Development(in Chinese)*. Shanghai: Shanghai Renming Press

Shanghai Statistical Bureau, 2001. *Shanghai Year Book (2002)*. http://www.stats-sh.gov.cn/2002shtj/tjnj/2002/tjnj2002.htm.

Shlomo A., Raymon A., Sidihijai T. and Emiel W. 1983. Introduction and summary. in *Land for Housing the Poor*. Shlomo A., Raymon A., Sidihijai T. and Emiel W. (*eds*). Singapore: Selectbooks

--------. 1983. Conclusion and recommendations. in *Land for Housing the Poor*. Shlomo A., Raymon A., Sidihijai T. and Emiel W. (*eds*). Singapore: Selectbooks

--------. 1983. Households. in *Land for Housing the Poor*. Shlomo A., Raymon A., Sidihijai T. and Emiel W. (*eds*). Singapore: Selectbooks

Short J. R., Kim Y. U., 1999. Globalisation and the City. Harlow: Addison Wesley Longman Ltd

Siklos, P., 2000. Capital flows in a transitional economy and the sterilization dilemma: the Hungarian experience, 1992-1997. *Journal of Policy Reform* 3(4): 373-391

Sonstelie J. C., Portney P. R., 1980. Gross rents and market values: testing the implications of Tiebout's hypothesis. J*ournal of Urban Economics* 7: 102-118

State Council. 1994. Guowuyuan Guanyu Shenhua Chengzhen Zhufang Zhidu Gaige De Jueding [A decision from the State Council on deepening the urban housing reform]. State Council Documentation, No. 43

---------. 1998.Guowuyuan Guanyu Jingyibu Shenhua Chengzhen Zhufang Zhidu Gaige Jiakuai Zhufang Jianshe De Tongzhi [A notification from the State Council on further deepening the reform of urban housing system and accelerating housing construction]. State Council Documentation, No. 23

---------. 1998. Guangyu Zhubu Shishi Chenzhen Zhufang Zhidu Gaige de Fang'an [Implementation plan for gradual housing system reform in cites and towns]. State Council Documentation, No. 11

Stewart C. and Cash W. 1982. Interviewing Principles and Practices. Wm. C. Brown Company Publishers. Dubuque, Iowa

Stewart D. W., Shamdasani P. N. 1990. *Focus Groups: Theory and Practice*. London: Sage Publications.

Straszheim M., 1974. Hedonic estimation of housing market prices: A further comment. *The Review of Economics and Statistics* 56: 404-406

---------. 1975. An econometric analysis of the urban housing market. National Bureau of Economic Research. Cambridge, MA

Stutz F., Kartman A.E., 1982. Housing affordability and spatial price variations in the United States. *Economic Geography* 58: 221-235

Sun, H. 1998a. *Foreign Investment and Economic Development in China: 1979-1996*. Averbury, U.K.: Ashgate

——. 1998b. Macroeconomic Impact of Direct Foreign Investment in China: 1976-1996. *The World Economy*. 21:675-694

Sykora L., 1994. Local urban restructuring as a mirror of globalisation processes: Prague in the 1990s. *Urban Studies*: 1149-1166.

Tang T.H. 2003. The development and the trend of China's political and institutional reform. National School of Administration: http://www.nsa.gov.cn

Teixeira C., 1995. Ethnicity, housing search and the role of the real estate agent: a study of Portuguese and non-Portuguese real estate agents in Toronto. *Professional Geographer* 47(2): 176-183

Tse. R.Y.C., 1998. Housing price, land supply and revenue from land sales. *Urban Studies* 35: 1377-1392

Tu Y., 1997. The local housing submarket structure and its properties. *Urban Studies* 34: 337-353

Walcott S. 1995. Niches and Networks: Urban Regional Growth in Indianapolis, 1979-1994. Ph.D. Thesis. Indiana University

Wang H. K., Li C. J. 1997. Shanghai's land development: a view from the transformation of mainland China's administrative systems since 1978. Paper presented in the 5th Asian Urbanization Conference, 26-29 August, London.

Wang Y. P., Murie A. 2000. Social and spatial implications of housing reform in China. *International Journal of Urban and Regional Research* 24: 397-417

Wang Y. W. 2005. From interest group to "sudden huge profits" group (*cong liyi jituan dao baoli jituan*). *Chinese Business Times (Zhonghua Gongshang Shibao)* 05/18/2005

Watkins C. A., 1999. Property valuation and the structure of urban housing markets. *Journal of Property Investment and Finance* 17(2): 157-170

Watkins C. A., 2001. The definition and identification of housing market. *Environment and Planning A* 33: 2235-2253

Wei B. P.T., 1987. Shanghai: Crucible of Modern China. Oxford: Oxford University Press

Wei K. F. 2005. Who made the "Real Estate Conspiracy" (*shui zhizao le fangdichan yinmou*). *Chinese Business Times (Zhonghua Gongshang Shibao)* 05/26/2005

Wilhelmsson M. 2000. The impact of traffic noise on the values of single-family houses. *Journal of Environmental Planning and Management* 43(6): 799-815

William A. D. 1983. The provision of land for the urban poor: concepts, instruments and prospects. in *Land for Housing the Poor*. Shlomo A., Raymon A., Sidihijai T. and Emiel W. (*eds*). Singapore: Selectbooks

---------.1994. Urban land and macroeconomic development. In *Methodology for Land and Housing Market Analysis*. Gareth J. and Peter M. W. (eds). Lincoln Institute of Land Policy: Cambridge, Massachusetts

Wilson D. and Huff J., 1994. Marginalized Places and Populations---A structurationist agenda. Westport, CT: Praeger Publisher

Wong K. K., Zhao X. B. 1999. The influence of bureaucratic behavior on land apportionment in China: the informal process. *Environment and Planning C* 17: 113-126

World Bank. 1992. *China: Implementation Options for Urban Housing Reform*. Washington DC: World Bank.

---------. 1997. *China 2020: Disparities in China.* Washington, DC: The World Bank

Wu F., 1998. The new structure of building provision and the transformation of the urban landscape in metropolitan Guangzhou, PRC. *Urban Studies* 35: 259 - 283

---------. 1999. The 'game' of landed-property production and capital circulation in China's transitional economy, with reference to Shanghai. *Environment and Planning A* 31:1757-1771

---------. 2000. The global and local dimensions of place-making: remarking Shanghai as a world city. *Urban Studies* 37: 1359-1377

---------. 2001. Housing provision under globalisation: a case study of Shanghai. *Environment and Planning A* 33: 1741-1764

---------. 2002a. Sociospatial differentiation in urban China: evidence from Shanghai's real estate markets. *Environment and Planning A* 34: 1591-1615

---------. 2002b, Geo-referencing social spatial data and intra-urban property price modelling in a data-poor context: the case study of Shanghai property data. In David K. and Gary H. (*eds*.) *Socio-economic applications of geographic information sciences: Innovations in GIS 9*. Taylor & Francis: London

---------. 2003. Globalization, place promotion and urban development in Shanghai. *Journal of Urban Affairs* 25: 55-78

Wu F., Yeh G., 1999. Urban spatial structure in a transitional economy: the case of Guangzhou, China. *Journal of the American Planning Association* 65(4): 377-395

Wu W. 2002. Migration housing in urban China. *Urban Affairs Review* 38(1): 90-119

Xie Q., Parsa A.R.G. and Redding B. 2002. The emergence of the urban land market in China: evolution, structure, constraints and perspectives. *Urban Studies* 39(8): 1375-1398

Xie L. L., Wang Y. M. 1995. Shanghai Development Studies. Shanghai: Shanghai Yuandong Publisher (in Chinese)

Yang S. M. 2004. The progress of China's economic reform. Hong Kong Commercial News: http://www.cnwnc.com/20040825/ca-1122426.htm

Yates J. and Wood G. A., 1996. Deriving a model of taxation impacts on rental investors. *Paper presented at conference of the European Network for Housing Research*. Helsingnor. Denmark

Yeh A. G. and Wu F. 1996. The new land development process and urban development in Chinese cities. *International Journal of Urban & Regional Research* 20(2): 330-354

Yeung Y., 1996. Introduction. In *Shanghai: Transformation and Modernization under China's Open Policy*. Hong Kong: The Chinese University Press

Yusuf S., Wu W., 2002. Pathways to a world city: Shanghai rising in an era of globalization. *Urban Studies* 39: 1213-1240

Zhang X. Q. 2001. Redefining state and market: urban housing reform in China. *Housing, Theory and Society* 18: 67-78

Zhang X. H. 2002. The review of the practices of China's open-door progress since 1949. *History Education* (in Chinese) April 2004: http://www.pep.com.cn/200406/ca412671.htm

ZHIGANG TANG

187A Billings ST, Quincy, MA 02171

Phone: (617)314-4237, Email: hotdeserts@hotmail.com

EDUCATION

INDIANA UNIVERSITY **Bloomington, IN**

Ph.D. in Urban Geography/GIS 08/2005

- **Specialization:** housing price model, housing market delimitation, institutional analysis, and Geographic Information System (GIS) application
- **Thesis:** "*Urban Housing Market in Transitional Economies: Shanghai as a Case Study"*

Master of Arts in Economics 05/2004

- **Specialization:** statistic analysis, modeling, and real estate finance/investment

NANJING UNIVERSITY **Nanjing, CHINA**

Master of Science in Land Management 07/2001

- **Specialization:** land planning and appraisal

B.S. in Land Management and Real Estate Development 07/1998

AWARDS

- Graduate Student Fellowship. Indiana University- Bloomington. 2001
- National Excellent Graduate Student Scholarship. Nanjing University. 2000
- RenMing Scholarship. Nanjing University. 1997, 1996 and 1995
- GuangHua Scholarship. Nanjing University. 1996

TEACHING EXPERIENCE

- Assistant Instructor, "Advanced GIS", 01/2004-05/2004
- Assistant Instructor, "Introduction to GIS", 09/2003-12/2003
- Instructor, "Introduction to Human Geography", 05/2003-06/2003
- Assistant Instructor, "Introduction to Human Geography", 01/2003-05/2003

EXPERIENCE

VANKE GROUP INC. **Shanghai, CHINA**

Project Consultant (summer intern) 06/2002-09/2002

- Collected demographic, economic and market data; predicted population, household income, economic development, and land supply for each city; prepared the social and economic development reports of the major cities in Yangtze River Delta for investment purpose; conducted revenue prediction for the possible projects in these cities; presented the results to the board of directors

REAL ESTATE INSTITUTE OF NANJING UNIVERSITY **Nanjing, CHIA**

Junior Consultant (Part-time) 09/1998-07/2001

- Worked as a team member to set up the parameter system for appraising the land value of Jiangsu Providential Petroleum and Chemical Corporation; led a 5 person group to prepare the final project report

ADDITIONAL

Computer Skills: SPSS, Minitab, Stata, Word, Excel, ArcGIS, MapInfo, Fragstats,

Language Skills: Native speaker of Chinese Mandarin, English