

HOUSING WEALTH AND CONSUMPTION IN THE CHINESE URBAN ECONOMY: EVIDENCE FROM MICRO-DATA

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ABSTRACT

Being able to understand how housing wealth affects consumption behavior is very important to a developing economy. Particularly, the Chinese residential real estate market is especially hard to manage given the country's large population base and rapid urbanization rate. Some previous researches have been done in this area using macro-data of China and found a small but positive housing wealth effect. In the present thesis, I question the use of macro-data and attempt to re-examine the urban housing wealth effect using micro-data obtained from an individually conducted household survey in Beijing. This paper provides a new methodology in testing the wealth effect. At the same time, my regression analyses suggest the possibility of a positive housing wealth elasticity of consumption among those who are in a long position in their housing consumption. Overall, the research paper provides a platform on which further studies of the Chinese urban housing wealth effect can unfold.

Keywords: Housing wealth effect, Micro-data, Consumption, Household survey, Urban real estate market, China, Beijing.

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I. Introduction to the Housing Wealth Effect

The past three decades have witnessed rapid economic growth and social reform in China. Particularly important are the establishment of private property rights and rapid urbanization. The recent significant price booms in various Chinese urban residential real estate markets have greatly impacted people's housing wealth. How these changes affect the economy naturally becomes an important question that must be answered.

One major way housing wealth can potentially influence the economy is through consumption. The impact of the change in housing wealth on consumption is called the housing wealth effect. Many authors have found a positive relationship between household wealth and consumption in the US and Europe (Case et al. 2001, Campbell and Cocco, 2004), but such findings cannot be reliably applied to the Chinese economy. This became obvious when some Chinese scholars tried to apply identical methods using Chinese macro-data and came up with small wealth elasticity of consumption (Lai and Bai 2008, Chen et al. 2009). Many factors can help explain this result. In particular, Chinese housing markets are significantly less liquid, especially compared to the US before the Great Recession, when housing value can be easily extracted from the Home Equity Line of Credit. Also, as the market cap of the Chinese real estate market is floating at nine times the country's GDP value, well above the 2:1 ratio when the US housing bubble burst, an increase in housing value might trigger only a slight increase in consumption due to the expectation of falling prices in the future and a sharp diminishing return.

In this paper, I aim to reexamine the housing wealth effect in the Chinese urban economy using household-level microdata collected via individual surveys. At the same time, I focus on people who are net long in housing consumption, i.e., those who own more housing than they owe, and try to determine whether there is in fact a positive direct spending effect caused by fluctuations in their housing wealth. Due to resource and time constraints, the scope of the survey was limited to the urban Beijing area, and the number of survey participants was relatively small. Nevertheless, the conclusion can still shed light on numerous hypotheses and provide implications of economic policies in terms of urban residential real estate market regulations and their influence on consumption, which is currently only about 40% of the GDP but is still sizable enough to influence the global economy.

After briefly discussing the development of the Chinese urban residential real estate market in Section II and summarizing important previous literature on similar topics in Section III, I will describe the survey methodology and the necessary assumptions in Section IV. In Section V, regressions analyses are conducted and the results are examined, and then appropriate tests and analyses are executed. Weaknesses and limitations of the research are acknowledged in Section VI. Further discussion in the context of the Chinese economy and suggestions for further researches on the topic are included in Section VII. Finally, Section VIII consists of the conclusion.

II. Development of the Chinese Urban Residential Real Estate Market: A Brief Background

In many ways, the Chinese real estate market is underdeveloped. The Cultural Revolution and the Great Leap Forward in the 1960s and 70s severely disrupted the Chinese economic system and caused investment in residential housing to plummet. It was not until the mid-1980s and the Open Door Policy that the average residential area per capita in urban China began to increase. One of the problems afflicting the residential housing construction market and its development was low rent costs, especially for government employees. This is why the “raise rent to increase residential capital” plan was created in the late 1980s. However, this plan was not fully adopted for political reasons. In the early 1990s, the real estate market for residential housing experienced the first unprecedented boom, leading to bubbles that brought high inflation and output fluctuations. However, the government reacted quickly to this phenomenon by implementing micro-level policies, such as eliminating the direct employee housing allocation from State-owned Enterprises or government agencies and instead “monetizing” the process into the selling of affordable housing. In another word, the enterprises and agencies switched from giving their employees houses to offering them large housing discounts.

In the new millennium, the real estate market and the government face several challenges. First, a large population base and rapid urbanization have led to a huge and exponentially increasing demand for urban housing. At the same time, the real estate market switched from a complete central-planning system to a much more market dictating one. Although this transition turns out to be beneficial in many ways, recent deregulation in the real estate market has led to harmful speculation activities and imprudent residential housing investment that dramatically accelerate price appreciation, satisfying the needs of the rich by sacrificing those of the poor and the middle class. To meet these challenges, the government has taken actions to speed up urban residential construction and has deliberately intervened in the market to control the structure and

ownership of residential housing to ensure that the needs of new immigrants to the cities can be met.

III. Literature Review

Before discussing previous research findings on the housing wealth effect, it is necessary to point out that the mere notion of a large direct spending effect resulting from housing wealth is doubtful when the focus is on the entire economy. Theoretical papers by Todd Sinai and Nicholas Souleles (2005) and Willem Buiter (2008) discuss such issues. Firstly, houses, as opposed to stocks, are not just assets but are also consumption goods. Since most people only purchase the amount of housing they need, a change in the housing value should not generate a significant spending effect. This is because the housing is not “for sale”, as are stocks. This is particularly true in China, where the financial markets are quite underdeveloped and traditional bequest motives are especially strong. Moreover, the society consists of people who have both “long” and “short” positions in housing, and a rise in the value of existing houses should only increase the consumption of those already in a long position. According to Calomiris et al. (2009), “In the aggregate, changes in house prices will have offsetting effects on value gain and costs of housing services and leave nothing left over to spend on non-housing consumption.” Thus, a change in housing wealth does not affect the amount of consumption, but only the distribution of consumption from a macro perspective. That is, people with housing spend more and those without spend less. Therefore, studies using macro-data can only measure the net effect of these two changes.

Following the Life Cycle/Permanent Income Hypothesis (LC/PIH), Modigliani (1954) estimates that the effect of a one-dollar increase in wealth (a positive wealth shock) leads to a four-cent increase in consumption in the US. Many researchers have re-examined the wealth effect after Hall (1978) discovers that the LC/PIH implies that consumption follows a random walk and is not influenced by predicted wealth changes. The majority of the research uses aggregate economic data. Many of the works published around 2000 focused on the stock wealth effect. As the housing market boom became apparent after 2004, scholars began to study the housing wealth effect in detail. Belsky and Prakken (2004) and Lacoviello (2004) found the housing wealth effect to be significant. Lacoviello (2004) also developed a “two-agent quantitative model” and investigated how home collateral values influence consumption by affecting debt capacity. The estimated structural parameters reveal that changes in housing prices could be a driving force of consumption fluctuations. According to Case et al. (2001), the estimated housing wealth elasticity ranges from 0.11–0.17 using data from 1975 to 1999. Then, Case, Shiller, and Quigley (2011) discussed many reasons why housing wealth elasticity might diverge from the stock wealth elasticity of consumption and thus be much less significant. These reasons include the tax benefit-enhanced bequest motive, the difficulty of constantly measuring one’s housing wealth, and the fact that the ease in extracting housing value, not increase in housing value in the U.S. was the major source of increased consumption.

Researches employing micro-level data have also provided important insights, particularly regarding the housing wealth effect. After Alan Greenspan raised the “Saving Puzzle”, many studies were conducted to determine the effect of increasing housing wealth on saving behaviors. According to Thaler (1990) and Hoynes and McFadden (1996), there was little evidence that saving behaviors change in response to an expected change in housing wealth. Following their

methodology, several later studies about the US wealth effect on consumption employed datasets from the Panel Study of Income Dynamics (PSID). Skinner (1996) found a much higher housing wealth marginal propensity of consumption (MPC) among younger households than older ones who tend to be more cautious in spending those gains. Engelhardt (1996) claimed the marginal propensity to consume out of real capital gains in owner-occupied households to be about 0.03. Using microdata from the Retirement History Survey, Levin (1998) found housing wealth does not affect consumption.

Campbell and Cocco (2004) used United Kingdom household data from the UK Family Expenditure Survey, matched with the nationwide dataset of regional home price indexes. They found a consumption elasticity of house price of about 1.7 for older homeowners in the U.K., but no significant impact for young renters.

A very limited amount of research has been done on the wealth effect of the Chinese economy. Lai and Bai (2008) estimated that the consumption elasticity of housing wealth was about 0.04 using 2001-2007 macro-data from multiple cities of China. Chen et al. (2009) found a long-term positive relationship between housing wealth and consumption, but at the same time the increases in housing wealth were most often transitory. Using the vector co-integration method, the two studies unrealistically assume stability in aspects of the Chinese economy the vectors represent. Employing aggregate data makes their results even more dubious.

In this paper, to avoid the downfalls in using aggregate data, I choose to collect micro-data via an independent survey, even though there is a risk of flaws such as a sampling error. According to Shea (1995), major deficiencies in using aggregate data to measure the wealth effect or other consumption related relationships may include the following (particularly in the

case of China, where data collection is under-developed): (i) small number of observations especially when the time frame is short; (ii) loss of information in the process of aggregation (for example, it is impossible to prove that the group of households whose consumption increases are exactly the one whose wealth increases, although in an aggregate, level consumption and wealth both grow); (iii) many additional assumptions about the homogeneity of individuals and the stability of the economy are often required; and (iv) multi-collinearity is hard to detect.

Moreover, intuitions about the wealth effect come from observations about household behaviors; the concept thus measures a micro-level relationship that can be much more reliably tested with micro-data.

IV. The Survey

Guided by the belief that micro-data would generate more convincing results, I conducted a household-level survey, consisting of 254 observations from 69 households over the years 2006–2010. I used 165 observations in the baseline regression analysis. I carefully designed the survey questionnaire so that the measurement error and the nonresponse error were minimized given the resource and time constraints (see Appendix A1/A2). At the same time, my sample selection takes into account whether household's current income can represent permanent income so as to control for unpredicted income changes in the regression analyses. The questionnaire also revealed the occupation, income, and consumption of durable goods of the respondents. Apparently, the ideal dataset would have been panel data on individual households that records their housing information and their consumption behaviors. However, the lack of such panel data forced me to investigate households' historical information about consumption, which

dramatically increased the difficulty of the survey design. I used the following techniques to overcome the problem.

The most important consideration is to choose a method to assemble credible consumption information for a five-year historical period. This is most challenging because it is impossible for people to accurately recall their previous consumption behaviors. Thus, I limited my scope on the consumption of durable goods, which is also typically found to be the portion of consumption that is most closely correlated with housing value fluctuation, especially if “spending on durable goods is predicated in part on unanticipated wealth increases” (Bostic, et. al., 2008). At the same time, household durable consumption, such as the purchase of automobiles and electronic devices, is the easiest to recall and thus is the most reliably testable portion of total consumption. To further increase homogeneity in the accuracy of people’s answers, I also divided durable goods consumption into several specific categories, such as automobiles, interior design products, televisions, etc. I also made a table based on those categories and asked people to provide information about the timing and price of the purchase of goods from each category over the period 2006–2010 (see Appendix A1/A2, part III). Generally, it is reasonable to expect that people will accurately recall when and at what prices important durable goods were purchased for the household in the last five years. Finally, I also included education and medical expenses that can either be treated as durable goods (“durable services”) or can at least be interpreted as an exogenous shock to the consumption function, as they are likely to limit the consumption of other durable goods.

The second big piece to the puzzle is how to measure housing value. The important issue is that people are usually unwilling to provide exact information about their housing property and wealth. At the same time, it is also impossible to keep track of how their estimates or perceptions

of their housing values changed over a historical period. To get around the non-response error, I therefore only asked for the district in which their housing properties are located, and how large the property is (the construction area of their housing in square meters). I also asked whether their housing property is part of an affordable housing program and whether they or their family actually use the house for residential purposes, which might generate a different housing wealth perception than normal homeowners. I then focused on people who own roughly the exact amount of or less housing than they need in my regression analyses by eliminating those that own multiple housing properties. The housing value variation is thus determined by the local housing price fluctuation as well as the size of the property, but the log difference is only dependent on the price movements of the district the housing properties belong to. In addition, I used the average per-square-meter price of second-hand housing trading so as to better model people's perception of the housing's fair market value (See Appendix A5). Although my methodology is less accurate than doing a year-after-year survey about people's actual perception of housing values, it is a good approximation, especially taking into account the balance between low measurement error and low nonresponse rate. A summary of the data collected is shown in Appendix A3.

Third, income is one of the most important factors in determining consumption behaviors. In order to measure how housing value fluctuations affect consumption, it is important to control for permanent income, namely the average income over a person's lifetime, taking into account expected future income changes. The mathematical representation of the relationship between consumption and income is summarized in section VII. However, permanent income cannot be reliably measured in reality. Thus, following Shea's (1996) Union Contract methodology, I selected those respondents whose job allows small or no significant real income fluctuation, and

thus their current income would become a good proxy for their permanent income, or at least they will not expect a large future income fluctuation that would change their current consumption behaviors. For example, college professors, as compared to free-lance businessmen, will typically expect no noticeable income change in the future and thus would perceive their current income as stable and “permanent.”

Some households did not specify when did they move into their current housing, and their consumption behaviors before the moving were obviously unrelated to their current housing’s historical price fluctuation. To get around this problem, I eliminated all data preceding a year in which significant consumption of interior design products happened, which implied the household was moving into the current housing. This way, all consumption data relates to after the household has moved into its current housing.

Judging from the mean and variability in income, living area, occupation, and age of the remaining participants, the omission of 89 observations is unlikely to cause a significantly larger sampling error than the original dataset. However, those omitted are mostly respondents with volatile incomes and thus might have certain special characteristics. For example, more men were excluded than women. The average age of the remaining sample is also about four years older than the entire sample.

The actual survey was conducted from March 10, 2010–March 25, 2010. The actual execution was led by Yihui Zhong, Associate Professor of Economics and Management at the China Institute of Industrial Relations (CIIR). The survey respondents who returned complete and acceptable questionnaires included parents of college students from three universities in Beijing (51), faculty and staff members from CIIR and Peking University (9), and employees of

the two State Owned Enterprises: Sinochem Petroleum Exploration and Production Company and Fulihua Cultural Development Company (9).

Methodology

i. The Regression Form

Due to resource and time constraints, I directly employed the LC/PIH model to measure wealth elasticity and to increase comparability to the existing literature. Some previous papers, such as (Bostic, et. al.), regress $\ln C_t$, household consumptive expenditure of year t , on $\ln Y_t$, log of total income of year t , and $\ln W_t^H$, log of estimated market value of private-owned houses:

$$\ln(C_t) = \alpha + \beta_1 \ln(Y_t) + \beta_2 \ln(W_t^H) + \varepsilon_t \quad (1)$$

The above regression has a fatal error in that it does not measure the change of wealth and consumption directly and thus reveals not the wealth effect but only the correlation between wealth and consumption in an economy at a particular point in time. This differs from the actual definition of the wealth effect, which is how a change in a particular household's housing wealth would affect its (durable-goods) consumption behavior now or in the future.

Based on Campbell and Cocco (2004), I use the following regression:

$$\Delta c_{i,t} = \beta_0 + \beta_1 \Delta w_{i,t} + \beta_2 \Delta w_{i,t-1} + \beta_3 y_i + \varepsilon_{i,t} \quad (2)$$

The term $\Delta c_{i,t}$ (also represented as c_t or $D\ln Cna$), the durable-goods consumption growth, is calculated as $\log C_{i,t} - \log C_{i,t-1}$; the term $\Delta w_{i,t}$ (also represented as w_t), the real housing wealth

growth, is approximated by $\log W_{i,t} - \log W_{i,t-1}$; and the term $\Delta w_{i,t-1}$ (also represented as w_{it}), the one year lag real housing wealth growth, is approximated by $\log W_{i,t-1} - \log W_{i,t-2}$. Thus, the coefficients β_1 and β_2 represent the corresponding elasticity of consumption. At the same time, the term y_i is the log of household income Y_i , which is included as representing permanent income, as stated in Section III. One can potentially divide both consumption and housing wealth data by household population to obtain per-capita information; however, doing so would not change the coefficients of interest β_1 and β_2 .

ii. Results from Baseline Regression

The consumption data I collected sometimes exhibited huge fluctuations whenever automobile purchases occur. Since automobiles, like houses, can be regarded as assets and their purchase can increase people's wealth perception, I consider automobile consumption an exogenous private investment irrelevant to housing wealth and other durable goods consumption. Other expenditures that can sometimes make up a large part of consumption are education and medical expenses. This category is especially important due to the poor social security and education system in China. These are services the effects of which last years into the future and thus can be regarded as "durable services" consumption. More importantly, incurring these expenses will have dramatic substitution effects on other durable goods consumption, which is unrelated to housing wealth fluctuations. However, there are possible downsides to including such expenses; this is discussed in Section VI.

Table 1

VARIABLES	w_t	w_{t1}	y	Obs.	R^2
c_t	2.237*	2.415	0.149	165	0.0239
	(1.189)	(1.659)	(0.237)		

Notes: SE in parentheses; ** $p < 0.05$, * $p < 0.1$; missing values are omitted from regression.

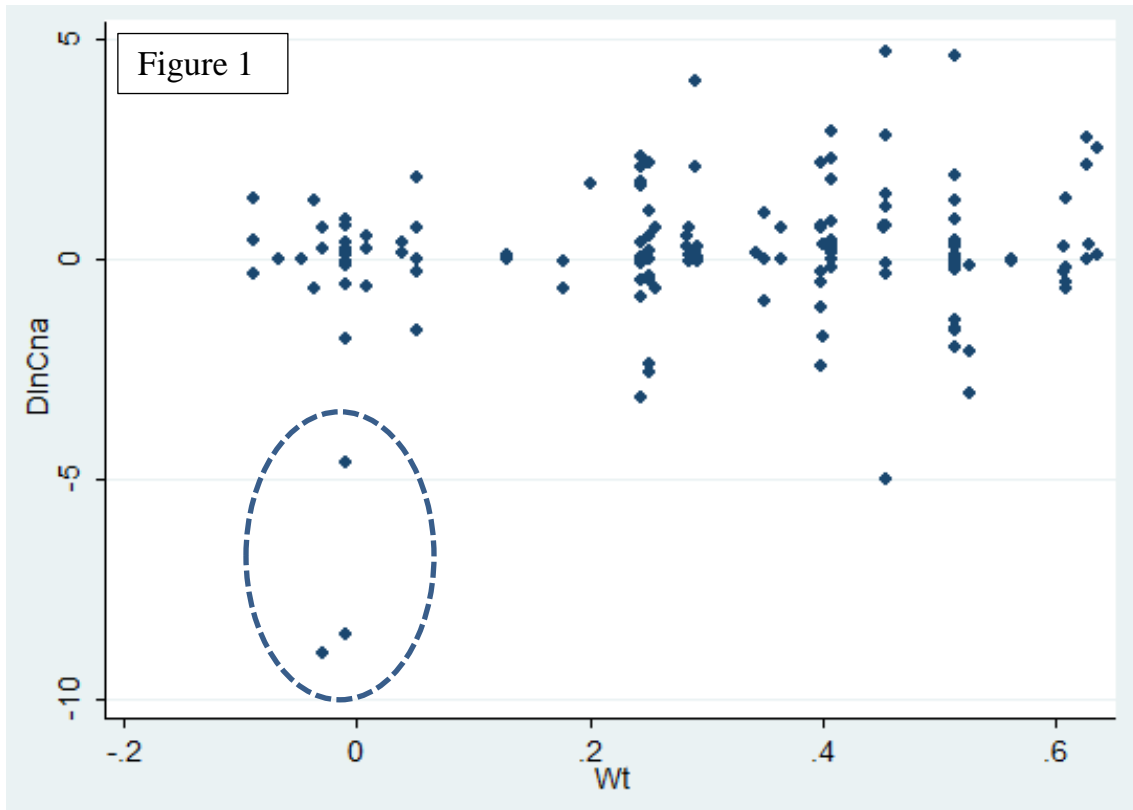
The result of the baseline regression using consumption data excluding automobile purchases is represented in Table 1. The β_1 term is statistically significant only at the 6.2% level, with a p-value of 1.88. The 93% confidence interval is [0.68, 4.41], which implies a very large and positive housing wealth elasticity of consumption. To better incorporate my methodology, I then eliminate surveyors who are farmers or whose job is highly dependent on the agriculture industry since their income is very volatile and thus cannot be used to approximate permanent income. The corresponding regression gives the following result.

Table 2

VARIABLES	w_t	w_{t1}	y	Obs.	R^2
c_t	2.732** (1.265)	2.261 (1.759)	0.186 (0.250)	150	0.022

Notes: SE in parentheses; ** $p < 0.05$, * $p < 0.1$; missing values are omitted from regression.

As shown in Table 2, β_1 is even more statistically significant and larger, with a 95% confidence interval ranging from 0.23-5.23. However, the result is obviously not very indicative in terms of what the elasticity actually is due to high standard error, and it is perfectly possible that the number is what others have predicted using macro-data, that is, 0.04 or lower. However, the result does point to a positive and potentially large housing wealth elasticity of consumption.



iii. Outliers

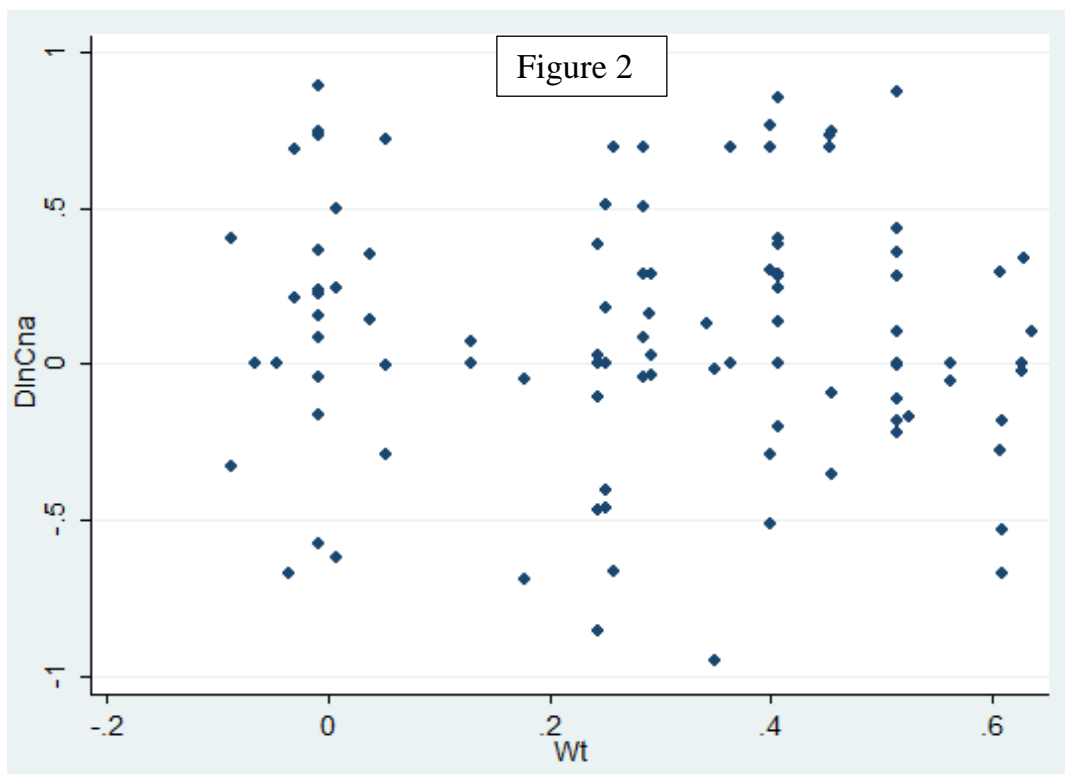
Any elasticity above 2 seems to be excessively large and dubious, and in fact, from the graph above (Figure 1), it is self-evident that the large and significant result in β_1 is very much driven by the sizable negative consumption outliers when coincidentally $w_{i,t}$ are low (circled in the graph). In two of the three cases, the decreases in consumption come from significant medical or education expenses in the previous year. This might create the illusion of less voluntary durable goods and services consumption in the subsequent year. At the same time, all three outliers occur from the year 2008 to 2009 when housing wealth dropped in the midst of the global recession, so it is likely that the consumption reductions are associated with other factors such as decreasing value of other properties. Moreover, it is just intuitively unlikely that a housing wealth log change between -0.1 and 0.7 could be the cause of any consumption log changes greater than 1

in absolute value, which almost represents an increase or decrease of about 300% in the level of consumption. Restricting the focus to small consumption changes, meaning a $c_{i,t}$ of smaller than 1 in absolute value, should theoretically still give us a statistically significant result if the relationship between housing wealth change and consumption change is solid. However, as is demonstrated below (Table 3), the restriction destroyed the significant elasticity obtained in the previous regression.

Table 3

VARIABLES	w_t	w_{t1}	y	Obs.	R^2
c_t	0.417	0.940*	-0.020	102	0.0396
	(0.357)	(0.510)	(0.068)		

Notes: SE in parentheses; ** $p < 0.05$, * $p < 0.1$; missing values are omitted from regression.



We can see that for small or “normal consumption changes”, the null hypothesis cannot be rejected for the housing wealth elasticity of consumption (Table 3, Figure 2). More importantly,

these consumption changes seem to be significantly less correlated with housing wealth variation than my initial regression. Thus, if a causal relationship indeed exists between housing wealth change and consumption, it is more likely to be weak than strong, but still positive than negative.

iv. Joint Tests on w_t and w_{t1}

Notice that w_{t1} sometimes exhibits a larger and more statistically significant relationship with c_t than w_t , especially as we narrow down the range of consumption change. Since w_{t1} is not actually statistically significant at the 5% level in any of the tests, I will not discuss β_2 and its implications individually. Rather, joint tests on w_t and w_{t1} should shed more light on the question of whether housing wealth influences consumption.

Table 4

VARIABLES	w_t	w_{t1}	y_t	Obs.	R^2
$\ln(C_t)$	2.732** (1.265)	2.261 (1.759)	0.186 (0.250)	150	0.022

Notes: SE in parentheses; ** $p < 0.05$, * $p < 0.1$; missing values are omitted from regression.

Test: $w_t = w_{t1} = 0$ $F(2, 146) = 2.90$, $prob > F = 0.0580$

Apparently, as indicated in the graph, the possibility of obtaining coefficients β_1 and β_2 of 2.73 and 2.26 is only 5.8% if no relationship exists between consumption and housing wealth (Table 4). However, as happened in the t-test for w_t , the significance level drops significantly when the log difference of consumption is restricted to 1 in absolute value as an attempt to approximate small or normal durable goods consumption (Table 5). The p-value increased to 15.1%, which partially discredited the potential link between w_{t1} and consumption.

Table 5

VARIABLES	w_t	w_{t1}	y_t	Obs.	R^2
$\ln(C_t)$	0.417	0.940*	-0.020	102	0.0396
	(0.357)	(0.510)	(0.068)		

Notes: SE in parentheses; ** $p < 0.05$, * $p < 0.1$; missing values are omitted from regression.

Test: $w_t = w_{t1} = 0$ $F(2, 146) = 1.93$, $prob > F = 0.1506$

At the same time, a t-test on $(\beta_1 + \beta_2)$ also generates an insignificant result, giving a 95% confidence interval ranging from -0.29--3.01, with an expected value of 1.35 (Table 6). These joint tests seem to indicate that, especially when consumption behaviors do not experience dramatic changes, the effect of housing wealth on consumption is unlikely to be large (such as the 1.7 housing wealth elasticity in Britain discovered by the Campbell and Cocco study), but still much more likely to be positive than negative if it exists.

Table 6

VARIABLES	w_t	$w_{t1} - w_t$	y_t	Obs.	R^2
$\ln(C_t)$	1.356	0.940*	-0.202	102	0.0396
	(0.832)	(0.510)	(0.068)		

Notes: SE in parentheses; ** $p < 0.05$, * $p < 0.1$; missing values are omitted from regression.

V. Discussion

When large and abnormal consumption changes that are probably driven by omitted variables such as private investment loss are eliminated, this microdata-based research cannot obtain statistically significant findings about the housing wealth effect in the urban Beijing area. This section is devoted to discussing the limitations of the methodology and the potential errors in

reaching the results. Possible reasons for an insignificant result under the context of the Chinese urban real estate market will be discussed in the next section.

First and foremost, the number of observations was small. Even using data from all ten districts of Beijing, the number of observations of wealth change was still limited to 40 during the last five years which sometimes creates large standard errors in coefficient estimation. A possible next step is to include data from other cities and their districts or to subdivide districts into blocks or different residential communities, and thus obtain more variations in the explanatory variables. Household level surveys can also potentially ask the household's estimated market value of their housing if the response rate is not sacrificed and the integrity of the data obtained can be ensured.

Second, the measurement of consumption, although mostly accurate given the availability of resources, is far from ideal. The study of wealth effect requires measuring the amount of voluntary consumption of both durable and non-durable goods. At the same time, consumption, especially durable goods consumption, sometimes occurs as a result of specific events and specific needs, which is irrelevant to the wealth a household holds. For example, consumption of interior design products will necessarily happen after the purchase of a house to avoid huge potential opportunity costs. At the same time, sometimes consumption behavior is not voluntary and thus will not rely on people's wealth perception. For example, a recorder is needed not because the household "feels richer" and wants to buy it, but because the child is trying to learn English and needs one. Thus, consumption behavior itself is complicated to interpret and finding a direct relationship between wealth and consumption might require a more accurate survey and more detailed categorization of consumption behaviors.

Third, only households that have steady income were included in the study, which may cause sample bias. These households were usually middle-class households and many are in some ways connected to the government and thus have different consumption behaviors. To illustrate, in my dataset, 35% of households own affordable housing, which is significantly greater than the city average (23% in 2009, Deng et. al., 2011), especially after the 2006 policy shift from selling affordable housing to renting at low costs. This is partially a result of oversampling on college campuses as opposed to the general public, since a large portion of faculty and staff is entitled to special affordable housing purchase benefits that are not generally available to the public.

Lastly, I had to omit some important variables that might be integral parts of the story, such as inflation, which is becoming increasingly important in light of the 5.3% YOY inflation rate in first quarter of 2010. Unexpected inflation, such as what China has experienced in 2008 and 2010 (see Appendix A4) can be reflected in income and housing wealth fluctuations, therefore creating endogeneity problems. Inflation can also influence people's perception of wealth and their confidence in the economy and thus their willingness to spend. Besides inflation, wealth of other kinds, especially stocks, might also be an important source of overall wealth variation and thus influences household consumption. In particular, the large negative consumption outliers in 2009 that contribute significantly to the initial sizable elasticity in section V might be a result of falling asset value due to the global economic slowdown. Further studies should try to include more explanatory variables and instrument away variables that potentially have endogeneity problems.

The resource and time constraints limited the scope of the survey and the soundness of the results. However, the present research can still serve as a starting point for further micro-level investigation.

VI. Further Discussion in the Context of the Chinese Economy

Besides the research constraints discussed in the previous section, there might be characteristics unique to the Chinese residential real estate market that contribute to a weak and insignificant correlation between housing wealth and consumption behavior. Among them the most important factors are expectations of a real estate bubble and future housing price drops, strong bequest motive combined with the introduction of high taxes on housing resale, and wealth perception based on relative wealth as a cultural phenomenon.

Expectations of housing bubbles have been evident in Beijing especially in the recent period with average housing price skyrocketing by 76% from 2009 to 2010 in the wake of the economic slowdown (See Appendix A5). Evidences such as the bizarre ghost malls, ghost highrises, and even ghost cities have indicated the inflation of the bubble. Unlike the U.S. bubble, the Chinese property bubble isn't founded on cheap credit, which makes people believe that it won't burst in the same way as the American one. At the same time, large state-owned enterprises collectively pay around 27% above market value for housing and offer them to their employees in a discount, very much leading the property grab (Deng, et al., 2011). Many indicators such as housing price over rent and housing price over income rises dramatically, symbolizing the departure of housing asset values from their fundamentals (Deng, et al., 2011).. Using the LC/PIH framework, consumption is determined by:

$$C_1 = \frac{A_0}{n} + \frac{1}{n} \sum_{k=1}^{\infty} E(Y_k + \Delta W_k), \quad (3)$$

where A_0 represents the initial wealth accumulation, and $Y_k, \Delta W_k$ represent income and change in wealth at year k respectively. When expectations of future loss in housing wealth

prevail, or when uncertainty restrains the expected value of perceived gain the housing wealth, current consumption C_1 is unlikely to increase as a result of nominal increase in housing value.

Alternatively, strong bequest motive and constraints on housing resale such as high taxes can create barriers to selling housing properties, and thus greatly discounting or even eliminating their effect on people's wealth perception. For example, it usually takes years for homeowners to obtain the "Housing Property Certificate" from the local government with which people can resale their properties; this is especially the case for affordable housing owners and employees of State-Owned Enterprises who obtain housing benefits from the company. In such cases, ΔW_k doesn't include the housing wealth fluctuation simply because it is not for sale or not tradable. Subsequent researches can compare normal households to those that own multiple housings, or those that have obtained the Housing Property Certificates of their housings and thus can potentially sell their housings.

Lastly, relative wealth perception might be able to explain the insignificant result. When prices of housing increase across all districts of the city, it may be true that only households from those districts with above-average price increase can perceive an increase in ΔW_k , or "feel wealthier." Ideally one can test this hypothesis by running the baseline regression on a subset of households from the districts that experienced the most housing price appreciation from each year. However, since the number of observations on wealth change is already small in my survey, doing so on the present dataset would reduce the number of observations on explanatory variable by half to only 20, and thus cannot generate convincing regression results. Therefore, I leave this question for future researches to investigate.

VII. Conclusions

Being able to understand the housing wealth effect is very important to a developing economy. Particularly, the Chinese residential real estate market is especially hard to manage given the country's large population base and rapid urbanization rate. Some previous researches in this area used macro-data of the Chinese economy and found a small but positive housing wealth effect. In the present thesis, I attempt to re-examine the urban housing wealth effect using micro-data obtained from an individually conducted household survey in Beijing. The initial result shows statistically significant and abnormally large housing wealth elasticity of consumption, but it is mostly driven by outliers of consumption change probably correlated with wealth and income factors other than housing. Subsequent tests on smaller (and ordinary) consumption changes show no statistically significant relationship between consumption and housing wealth. However, the confidence intervals obtained indicate that if such relationship do exist, it is more likely to be positive and small than otherwise. Further studies on this topic using micro-data should try to collect more observations especially on housing wealth changes either by expanding regions covered to other cities or by surveying more in depth into different residential communities. At the same time, it is important to measure consumption behaviors more accurately and in more detail, in order to capture the relationship between housing wealth and specific parts of consumption. Lastly, more comprehensive survey could help reduce endogeneity problems by investigating into potential explanatory variables and by approximating permanent income better. Overall, the research paper provides a platform on which further studies of the Chinese urban housing wealth effect can unfold. Results found on this topic can provide important implications about the connections between the real estate market and the

general economy, and thus shed light on policy making in the urban residential real estate market, which has not been particularly effective recently.

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A1. Survey Questionnaire (English)

UNIVERSITY OF CALIFORNIA, BERKELEY
Economics

Survey on the
Consumption
Behavior of
Beijing
Residents

University of
California, Berkeley
Graduation Thesis

Economics Department
Yizhou Jin
3/2011

Hello,

My name is Yizhou Jin, and I am currently a graduating senior at the University of California at Berkeley. I, under the supervision of my adviser David Romer, am currently conducting a survey on Chinese people's consumption behavior.

Thank you very much for choosing to take part in the survey. Your participation is crucial to our research.

For your convenience, I divided the survey into three parts. The first part is about your basic personal information, such as your age range and gender, so that we can compare our research results among different demographic groups. The second part is about your family's basic information, such as family population. The third part is the center of the survey, consisting of a table that requires you to recall your family's durable goods consumption behaviors during the years 2006-2010. I carefully categorized durable goods so that you only need to recall whether your household has purchased a specific kind of durable goods or not in the last 5 years, and if so, when and at what price were they purchased.

The entire process is going to take about 10-20 minutes of your time, our surveyor will check whether your questionnaire meets our standard once you have finished. Once your questionnaire is approved, you will be given a 10 Yuan compensation for your time and effort.

To avoid intruding on your personal privacy, the survey will not ask for any information that will allow us to identify you or your family. At the same time, the anonymous survey will be converted into a dataset that will always be kept confidential.

Again, thank you very much for participating in this survey.

Yizhou Jin

Economics Department

University of California, Berkeley

3/12/2011

I. Basic Personal Information

1. Your Gender: M F
2. Age Range:

A. <20	B. 20-25	C. 25-30	D. 30-35	E. 35-40
F. 40-45	G. 45-50	H. 50-55	I. 55-60	J. 60+
3. Occupation: _____
4. Where is your current housing? (in which district?) _____
5. Annual Combined Income of your household _____
6. Have your income been steady in the last five year? _____

II. Household Information

1. Your Marital Status:

A. Single	B. Married
-----------	------------
2. How many children do you have:

A. 0	B. 1	C. 2	D. more than 2
------	------	------	----------------
3. Who have been living with in your current housing during the last 5 years?

2006-2007	2007-2008	2008-2009	2009-2010	2010-2011

- | | | | |
|------------------|----------------------|------------------------|-----------------|
| A. Just Yourself | B. Your Wife/Husband | C. Your Child/Children | D. Your Parents |
|------------------|----------------------|------------------------|-----------------|
4. If you've chosen C in number 2 for any of the past 5 years, how important is your children's income?

A. Children's income is the main source of household income	B. Children have no income	C. Children's income is only a minor source of household income
---	----------------------------	---

DVD/Home entertainment equipment										
Fridge/Washing machine/Water heater										
Stove/Microwave oven and other kitchen equipment										
Interior Design Products*:										
Expensive clothes/Jewelry, other house decorations.										
Education and related special expenses**										
Medical expenses and related special expenses***										
Other: _____ _____										

*Interior Product: Table, Chair, Sofa, Bed, Shelf, Bathroom appliances (sink, bath tub...), lights, Doors/Windows

**Ex: Tuition Fees (School or extra-curriculum training), sponsor fees for non-native enrollment –Non-Daily Expense

***Ex: Medical Insurance Expenses and operation charges

Note: Special expenses are the opposite of daily expenses. Daily expenses include dining, living or transportation expense, but expenses such as tuition and medical expenses are not on a daily basis and whose effects last a long period of time into the future.

A2. Survey Questionnaire (Chinese)

UNIVERSITY OF CALIFORNIA, BERKELEY

Economics

中国北京地区居民消费情况调查

美国加利福尼亚大学
伯克利分校 2011 年
毕业论文系列

经济学部门
Yizhou Jin
3/2011

您好，

我的名字叫做靳毅州，我是就读于加利福尼亚大学伯克利分校的经济学部门的荣誉学员。在我的导师 David Romer 教授的指导下，我正在关于中国人民消费行为进行研究。

感谢您选择参加我们所发起的调查问卷活动。您的参与对我们的研究具有十分重要的意义，在此，我代表我们的科研小组向您表示诚挚的谢意。

为了您的方便，我们把问卷简化为三个部分：第一部分统计您的基本特征，如性别和年龄段，以辅助我们针对不同人群组进行比较分析。第二部分为您的基本家庭信息，如家庭成员数量，这样我们才能够判断您所处的家庭的人均消费情况。第三部分是问卷的核心部分，是对于您的家庭的过去我年内对于**耐久品**的消费状况。为了您的填写方便，我们在设计问卷时特意将耐久品进行分类，您只需回忆一下您的家庭是否在过去五年内购买了某一类的耐久品，如果是的话是在哪一年，大概花了多少钱。

整个过程大约会占用您 **10-20 分钟的时间**，您完成之后，我们的调查员会收集您的问卷并核对您的问卷填写是否能够达到我们的标准。一旦您的问卷填写情况通过了我们的调查员的检验，您将会得到 **10 元的现金补偿和奖励**。只有符合我们标准的问卷才会进入我们的数据库。

为了避免隐私问题，问卷中将不会涉及您的收入及房产等重要个人信息。同时，您的问卷调查将不会被记名，而且整个数据库也会一直处于保密状态，我们的研究成果的公布将只会是线性分析的结果。所以请您放心填写。

再一次对您的参与表示感谢！

靳毅州

经济学部门

加利福尼亚大学伯克利分校

2011 年 3 月 12 日

一. 个人状况 (半分钟)

1. 您的性别: 男 女

2. 年龄段:

K. <20 L. 20-25 M. 25-30 N. 30-35 O. 35-40

P. 40-45 Q. 45-50 R. 50-55 S. 55-60 T. 60+

3. 职业(如果您为学校工作的话, 请填写您的领域): _____

4. 您在北京市哪个区或区域居住? (请尽量具体) _____

5. 家庭收入状况(每年) _____

6. 您的家庭收入一直稳定么? (收入波动与通货膨胀基本持平) _____

7. 您会经常关注您现在所居住的房子价格么? _____

二. 家庭状况 (2 分钟)

1. 您的婚配状况:

A. 未婚/离婚/寡居 B. 已婚/重婚 C. 分居

2. 您的生育状况:

A. 暂无子女 B. 一个子女 C. 两个子女 D. 多个子女

3. 您的家庭组成(谁与您住在一起?), 请在每一栏中填入适合您家庭的选项(多选):

2006-2007	2007-2008	2008-2009	2009-2010	2010-2011

A. 您一人 B. 您的爱人 C. 您的子女 D. 您的长辈

4. 如果您在 3 中任意一年选择了 C, 请选择:

A. 子女为主要家庭收入来源 B. 子女无收入 C. 子女收入不或不能支持家庭开销

5. 如果您在 3 中任意一年选择了 D, 请选择:

A. 长辈为主要家庭收入来源 B. 长辈无收入 C. 长辈收入不或不能支持家庭开销

6. 您本人是否住在机关/学校/单位所分配的经济适用房? : 是 否

7. 您是哪一年搬入的现在居住的地方? _____

三. 消费情况 (10-20 分钟)

请您仔细回想**您的家庭**是否在过去的 5 年内购买过以下产品 (耐久品)。如果曾经购买过, 是在哪一年以怎样的价格购买的? 前 4 行是我们为了指导您正确填写而做的例子。

这一部分是我们研究调查的核心, 请您务必认真回忆并填写, 如果您有疑问或者担心, 请咨询我们的调查员。您在这一部分的填写也决定着我们是否能够利用您的答卷并补偿您的付出。

耐久品名称	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	当时的购买价格				
						2006	2007	2008	2009	2010
例子: 车及其保险/养护			√	√	√			19 万	3 万	3 万
例子: 沙发/床/浴池				√					2 万	
例子: 贵重的服/首饰	√	√			√	2000	3 万			5000
例子: 子女的教育等非日常开销	√	√	√	√	√	1 万	10 万	16 万	10 万	12 万
请您填写:										
车及其保险/养护										
摩托车, 电动自行车及其保险/养护										
自行车										
电视										
乐器 (钢琴等)										
台式或笔记本电脑/电脑配件										
MP3 等便携电子设备										
DVD/音响/家庭影院										
冰箱/洗衣机/热水器										
炉灶/微波炉/抽油烟机										
室内装修: 家居*										
贵重的服/首饰, 家庭装饰品										
子女的教育等非日常开销**										
老人的医疗等非日常开销***										
其他: _____ _____										

*家居包括: 桌子, 椅子, 沙发, 床具, 柜子, 厕所/淋浴用具 (水槽, 浴池), 灯具, 门窗等。

例如学费(学校, 课外班, 艺术/体育培训), 赞助费等非日常**开销

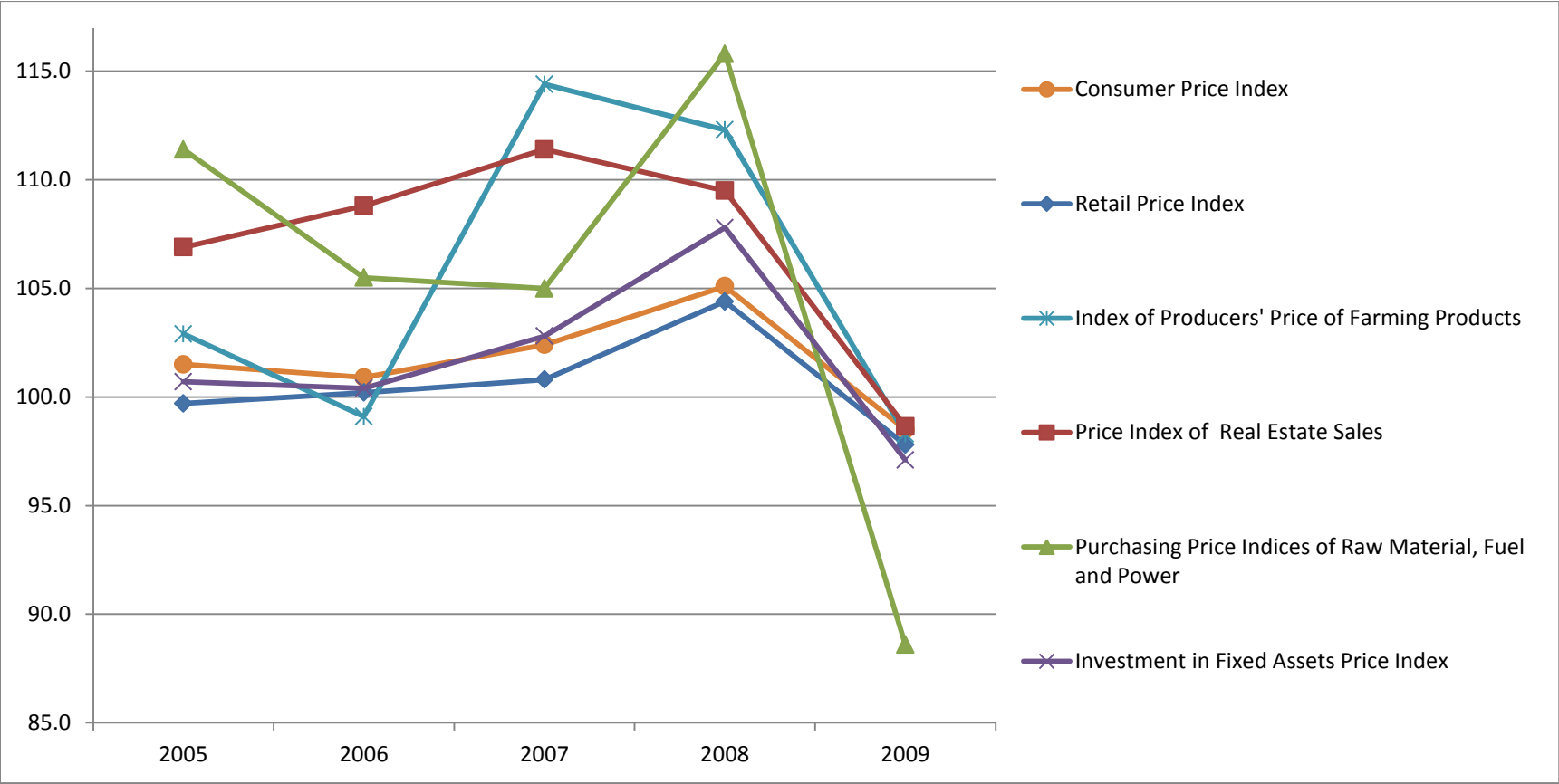
***例如医疗保险, 保养/手术费用等**非日常**开销

注: 日常开销是指衣食住行的每日必须的花费, 而学费或医疗保险等则被我们归为比较重要的非日常的特殊开销, 只在生命中的某个时段所需要。

A3. Survey Result Summary

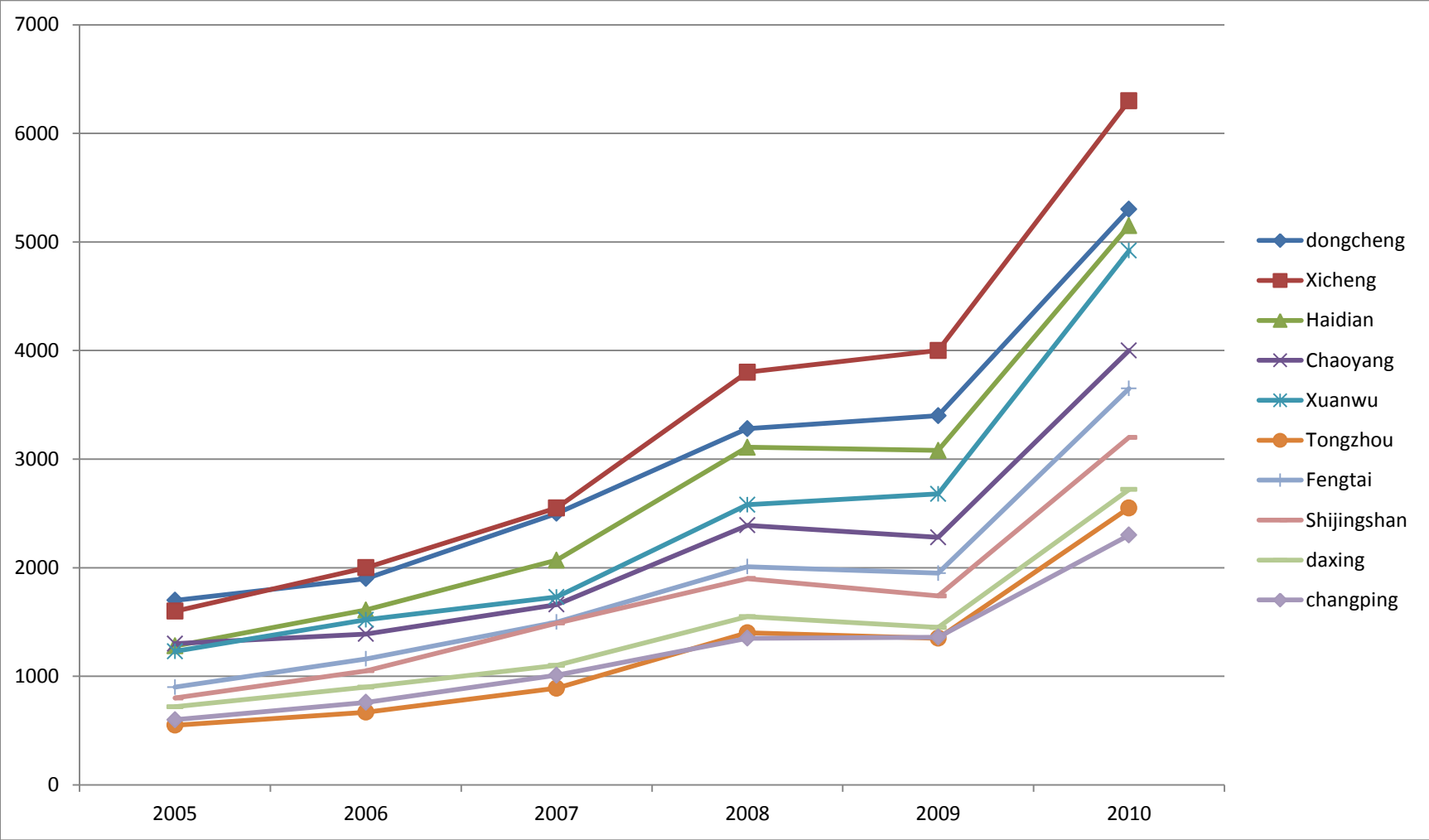
Variable	Obs	Mean	Std. Dev.	Min	Max
No.	254				
Household Code	254			1001	1069
Sex (1=male)	254	0.3653846	0.4826996	0	1
Age Range (take the mid-point)	254	41.29808	8.975145	27.5	60
Income per year (unit=10K)	254	8.4875	6.697868	1.5	30
Affordable Housing (1=yes)	254	0.3846154	0.487678	0	1
District	254	4.5	2.536687	1	10
Construction Area (m²)	254	115	82.26457	43	600
Year	254	2008.5	1.120731	2007	2010
Log Change in Consumption on Durable goods	254	0.1651569	1.758069	-8.987	4.85

A4. Inflation History of Beijing 2005-2009

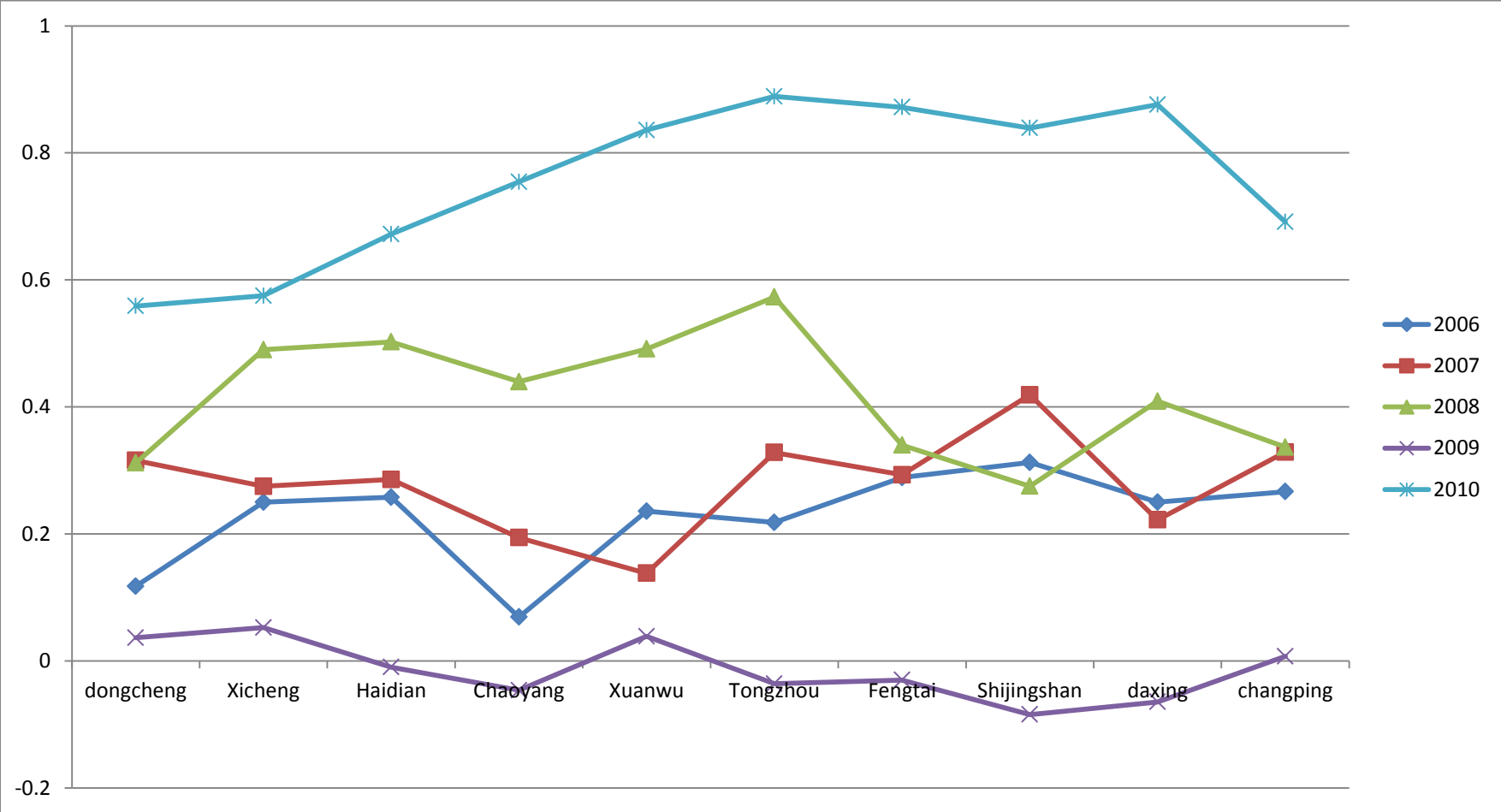


A5. Beijing District-Wise Real Estate Price Index for Second-Hand Housing Trading (2005-2010)

i. Real Estate Index Record for 10 Districts of Beijing (Source: China Real Estate Index Monthly Update 2005-2010)



ii. YOY Percentage Change in Real Estate Index Record for 10 Districts of Beijing (Source: Chinese Real Estate Index)



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