CAPITAL APPRECIATION POTENTIALS OF CHINESE RESIDENTIAL MARKET: IDENTIFICATION OF INVESTMENT OPPORTUNITIES

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ABSTRACT

The mission of our thesis is to assist residential real estate investors and developers in making more systematic investment decisions when selecting Chinese cities. In particular, our thesis has three major objectives, (1) to understand the residential price appreciation with respect to economic growth among 35 core Chinese cities, (2) to understand the dynamics of the residential market fluctuation, and (3) to predict the residential market movement.

Our models have suggested that the residential markets of Tier II Chinese cities shall outperform those of the other tiers in terms of capital appreciation under a sustainable economic growth condition, with Tier I Chinese cities experiencing the least collective growth.

Interestingly, our models have suggested that historical performance is a relatively good indicator of medium-term performance, in terms of capital appreciation potentials, under an up-market cycle. Our results have indicated that the capital appreciation performance ranking of our 5-year prediction period to 2012 are relatively consistent with the capital appreciation performance ranking of the historical 9-year trend between 1999 and 2007. In particular, our top five cities with the highest capital appreciation for the 5-year period to 2012 are Xiamen, Ningbo, Nanchang, Taiyuan, and Fuzhou, respectively; in comparison, the top five cities with highest capital appreciation for the 9-year period to 2007 are Ningbo, Xiamen, Qingdao, Nanchang, and Xian, respectively.

In terms of residential market dynamics, our models have revealed that the increase in sales transaction volume, the decline in real prime rate, and the loose mortgage policy have all contributed to the overheating of the Chinese residential market in 2007. But as the monetary policy and lending standards tighten, the sales volume was curbed and prices lost its steam. We observed that the policy change was not the only cause to the slowdown in sales transaction volume, but also the continued sales price growth; in fact, the policy change was a cause of the over-heated market. If the current pattern continues and supported by favorable policy, we expect the market shall show signs of relief in 2010; however, if prices over-shoot in the coming months, the market performance may actually reverse.

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CHAPTER I

INTRODUCTION

INTRODUCTION

China has undergone rapid economic reform in the past 30 years, changing from a centrally planned system that was largely closed to international trade to a more market-oriented economy that has a rapidly growing private sector, including its real estate market. As of 2008, China's GDP growth is the 8th fastest in the world at 9.8%, and the average salary of 35 of its top cities has undergone compound annual growth of more than 11% during the 1996-2007 period. The Nation's disposable income has also been growing at all time high prompting demand for improved living standards, leading to a vibrant residential market that has seen its Average Sales Price growing at more than 8% compounded annually between the 1999-2007 period. As of 2007, China's residential sales volume has reached 701 million square meters with total sales of RMB 2.56 trillion.

While foreign investors flocked to China for a slice of its real estate boom, residential prices at 1st tier cities have sky-rocketed. As the China residential market commercialization is still relatively recent, most investors have only paid attention to 1st tier cities, such as Beijing, Shanghai, Shenzhen, and Guangzhou, with less attention or understanding on the residential capital appreciation potentials of the other tiers of cities. After the continued surge in residential prices in the 1st tier cities, investors have begun to speculate that the capital appreciation of residential in these cities shall eventually slow down, with lesser tier cities becoming more attractive in comparison. As such, the mission of our research is to help real estate investors and developers to come up with a more systematic approach when making investment decisions in Chinese cities. In particular, our thesis has three major objectives, (1) to understand the residential price appreciation with respect to economic growth among 35 core Chinese cities, (2) to understand the dynamics of the residential market fluctuation, and (3) to predict the residential market movement.

We will start our assessment by providing an overview of China's residential market reform and the conventional methods currently applied by investors and developers in selecting cities, and then we will introduce our methodology in Chapter II, followed by two detailed sections of assessment results on our three major objectives, and a conclusion to summarize the implications to investors and developers.

CHINA REAL ESTATE REFORM

The reform of the PRC real estate market did not commence until 1988. Prior to 1988, the PRC real estate market was part of China's centrally planned economy, where the Nation had adopted a welfare housing system for 28 years. Back then, the PRC government and State-Owned Enterprises ("SOE") were obliged to offer welfare benefits to their employees, including housing. Despite of the housing benefits, the eligible Chinese were not given the rights to select their housing of choice, but were expected to accept whatever the government has allocated. At the same time, the housing system had also created heavy financial burden to the PRC government and SOEs.

In 1987, the Chinese real estate reform has taken its root when the Shenzhen city government sold land use rights for the first time through a public auction, marking the start of China's determination to transform its property market. Soon after the land auction in Shenzhen, an amendment of the constitution allowing land use right transaction was passed. In 1988, the National People's Congress and its Standing Committee of China ("NPC") amended the national constitution to officially permit the transfer of state-owned land use rights and subsequently led to the sale of public housing in major Chinese cities in 1992.

Between 1992 and 1998, the PRC government gradually solidified the foundation of its real estate reform by establishing an employee/employee-funded housing fund, issued regulations regarding sales and pre-sales of real estate, and setting forth a framework for real estate sales.

The actual commercialization of the Chinese residential market did not take off until 1998, when the state-allocated housing policy was formally abolished, followed by a series of financing incentives to residential buyers in 1999 where mortgage financing were increased to 80% from 70% with an extended financing term to 30 years and a formalization of procedures for sale of real estate in the secondary market.

Between 2000 and 2002, a series of regulations were implemented to promote private residential sales growth via the quality of construction, transparency of the grant of state-owned land use rights, and the pace of urbanization, and commenced the abolishment of price discrimination between domestic and foreign home buyers. In particular, the transparency of the grant of state-owned land use rights were executed by way of tender, auction, and listing-for-sale to avoid the risks of government-level corruptions via private negotiations with developers. The implementation of the land grant policy was generally welcomed by the public; however, economists have suspected that such policy may have

caused land prices to increase amid more competition (Zhiqiang Ren, 2009), and eventually led to the increase in residential prices.

As the residential prices rose at rapid levels, the PRC government then commenced to implement a series of anti-speculative measures in 2004 with an attempt to prevent market overheating. Despite the PRC government's effort, the policies have instead added much volatility to the residential market, creating as much confusion as they have solved. Contrary to many people's expectation, Chinese residential prices had actually continued with an upward trend until the end of 2007. Some researchers had suggested that the surge in residential prices during 2004-2007 was the results of a strong economy (Huai Chen, 2009), while others believed speculation and poor policy design are the culprit (Andy Xie, 2007). Moreover, there were conflict of interests between the Central government and local government, where local governments tend to favor high residential prices for more tax revenues.

In 2005 and 2006, the PRC government has brought forward a series of measures to curb speculation in its residential market, which has included the followings:

- Increased mortgage interest rate (2005)
- Introduced 5.55% business tax on total proceeds from resale of residential property within two years after purchase (2005)[1] and a 20% capital gain tax (2006)
- Imposed an idle land fee for land which has not been developed for one year starting from the commencement date as stipulated in the land grant contract and cancellation of land-use right for land which remains idle for two or more years (2005)
- Increased mortgage lenders' down payment to at least 30% of property value for units larger than 90sqm, from 20% (2006)
- Set minimum of 70% of residential development to be allocated for units smaller than 90sqm (2006)
- Forbade commercial banks from lending to developers whose project capital ratio fails to reach a minimum of 35%[2] (2006)

[1] Lock-up period was later extended to 5 years in 2006 and contracted back to 2 years in 2008

[2] The requirement was later reduced to 20% in 2008 to encourage investment

- Forbade individual foreigners who have stayed in China for less than a year from buying residential (2006)

In particular, the business tax levied on the resale of properties was initially designed to discourage speculative resale of property; however, such tax burden turned out to be borne by buyers, resulting in even higher residential sale prices. The capital gain tax also turned out to be ineffective as it is difficult for the tax bureau to conduct property appraisal. The 35% assets minimum for commercial lending was also believed to create an unintended effect of further increasing residential sales price amid a decline in residential supply. Furthermore, the 70% small-unit policy could have caused higher price for luxury residential amid a sudden lack of supply.

In September 2007, the People's Bank of China raised the mortgage down payment ratio from 20% to 40% for second home buyers and charged a 10% premium, subsequently leading to the residential market downturn throughout 2008.

By the end of 2008 the anti-speculative measures were reversed, in an attempt to revitalize the sinking economy, and have become favorable to the real estate market. Second home mortgage was loosened, and the commercial banks started to give more discretion on setting mortgage rates.

CONVENTIONAL PRACTICES IN INVESTMENT DECISIONS

We have interviewed 17 real estate entities in an attempt to better understand how existing real estate developers and investors make their investment decisions on the preferred Chinese residential market. The 17 interviewees include 8 prominent real estate developers from Hong Kong, China, and the United States, 7 regional real estate private equity funds ("PE funds"), a China market consultant, and a property research department of an investment bank.

Our interview results have indicated that different companies make different investment decisions based on their perspective company policies and investment focuses. Despite the differences, we have observed that the investment behaviors between real estate developers and PE funds are somewhat different when selecting Chinese cities.

Real Estate Developers Investment Behaviors

In particular, real estate developers generally appear to have a less systematic approach when selecting Chinese cities. Their investment decisions are typically dependent on family relationship with city governments and politicians, overall market sentiments, execution capability, liquidity of capital financing, externality effect, project returns, and local knowledge. Developers would study the general macroeconomics and demographics data such as GDP per Capita, population, urbanization rate, and affordability, but those macroeconomics data rarely determines the outcome of their investment decision. Instead, they would value highly on operations data such as occupancy rate and momentum in transaction volume and sales price growth.

The developers' approach to deal sourcing also tends to be passive in nature, without any strong preferences or limitations on city selections; instead, they would favor deals that offer the most preferential treatments by city government. Preferential treatments by city government may come in the form of cheap land in the earlier years of the China real estate market reform, tax breaks, more efficient permits and licenses processing or custom-made land auction requirements.

Execution capability plays a major role in terms of a developer's expansion ability. Quality human resources have always been a concern in China and most Hong Kong developers would have a team of senior executives from Hong Kong based in China to ensure effective project executions.

Externality effect is highly regarded by developers when selecting cities to invest in general. The theory is based on the assumption that while some 2nd tier cities are less known outside of China, the fact that a group of foreign developers having interest in a particular city shall create collective momentum on sales price and volume.

Major developers from Hong Kong generally pay no particular concerns to real estate policies and anti-speculative measures inflicted by the PRC government, as Hong Kong developers are mostly involved in developing quality high-end residential in China where demand still appear to be significant, particularly in 2nd tier Chinese cities. Moreover, since a lot of the development projects they obtained in China are supported by the respective city governments, the Hong Kong developers might be able to lobby for special status.

The Chinese cities that are of particular interest to our collective group of developer interviewees for residential development are listed in **Exhibit 1.1**.

Exhibit 1.1: Chinese Cities of Interest to Developers

Beijing	Dongguan	Nanjing	Wuhan
Chengdu	Foshan	Shanghai	Wuxi
Cheungsha	Guangzhou	Shenyang	Xian
Chongqing	Hangzhou	Shenzhen	Zhengzhou

PE Funds Investment Behaviors

PE funds generally have a more systematic approach to selecting a Chinese residential market. Their investment decisions to invest in a particular Chinese city are typically based on the preference of their limited partners (i.e. source of capital), liquidity of market, alignment of interest with joint venture partners, specific real estate product types covered by the funds, risks management, property yield, Internal Rate of Returns, and limitations on investment horizons. Similar to real estate developers, PE funds would also take into consideration of execution capacity, local market knowledge, supply and demand, and overall macroeconomic and demographic market conditions and trends, such as GDP per Capita, population, disposable income, job creation, affordability levels, foreign direct investments, and local real estate regulations and environment, when assessing investment opportunities.

In particular, the investment spectrum of PE funds is typically limited to 1st tier Chinese cities or cities that are in close proximity to the 1st tier cities. There are several aspects to such investment preference. Firstly, the limited partners typically have a lack of understanding in Chinese cities other than the 1st tiers, where market transparencies are higher; hence it is more difficult for the general partners to market the 2nd tiers. Secondly, PE funds generally have limited investment horizons of no more than 5 to 10 years; hence, it is crucial for the funds to have timely access to exit, where market liquidity is typically higher in the 1st tiers. Thirdly, the funds have limitations on human and capital resources, where it probably makes more sense for them to concentrate in the markets they are familiar with rather than diversifying into unfamiliar territories with limited local knowledge. Fourthly, PE funds are typically specialized in certain property types such as high-end residential, where such property products may not be as well received in the 2nd tiers compared to the 1st tiers.

Despite the preferences for 1st tier cities, PE funds are constantly on the lookout for other Chinese cities for opportunity investment that yields high Internal Rate of Returns.

For cities that are out of the 1st tier category, PE funds would typically consider highly for a reputable developer as joint venture partner rather than placing emphasis on selecting a particular city to invest in. Regardless, cities that have special economic zones and offer more efficient capital movements are always the funds' preference.

The Chinese cities that are of particular interest to our collective group of PE funds interviewees for residential investment and development are listed in **Exhibit 1.2**.

Exhibit 1.2: Chinese Cities of Interest to PE Funds

Beijing	Shanghai	Tianjin
Chengdu	Shenzhen	Wuxi
Guangzhou	Suzhou	Zhuhai

CHAPTER II

METHODOLOGY

DEFINITIONS

"Average Salary"	Real average salary, calculated by adjusting average nominal salary with CPI to 2007 value basis
"Average Sales Price"	Real average sales price, calculated by adjusting average transacted market residential nominal sales price per square meter with CPI to 2007 value basis.
"Average Sales Price Growth"	Average Sales Price's year-on-year growth, expressed in percentage
"Capital Appreciation"	Capital appreciation of market residential
"City Power"	Indicators that measure a city's economic growth potentials
"City Wealth"	Indicators that measure a city's quality standard of living
"Coefficient"	Statistical ratio impact of independent variable on Average Sales Price or Average Sales Price Growth
"CPI"	Consumer Price Index
"Direct Residential Demand"	Indicators that measure direct demand for residential
"Foreign Interest"	Indicators that measure foreign interest in a city
"GDP per Capita"	Real GDP divided by registered population
"GDP per Capita Growth"	GDP per Capita's year-on-year growth expressed in percentage
"Luxury Development Potentials"	Indicators that measure an individual's demand for durable and luxurious products and services

“National Wealth”	Indicators that measure the overall Chinese population’s purchasing power
“Personal Wealth”	Indicators that measure an individual’s purchasing power
“Population”	Registered population; does not include mobile population
“Population Growth”	Registered population’s year-on-year growth, expressed in percentage
“PRC”	People’s Republic of China; China
“Prime Rate”	Real prime rate, calculated by adjusting China’s Nominal 5-Year Mortgage Prime Rate (5 年期中长期贷款) with CPI to 2007 value basis
“R-Squared”	Correlation measurement of two or more series of data
“Real GDP”	Nominal GDP adjusted by CPI to 2007 value basis
“Shanghai Composite Index”	Shanghai Stock Exchange Composite Index’s annual return, expressed in percentage, and adjusted by CPI to 2007 value basis
“Supply”	Indicators that measure residential supply levels
“T-Statistics”	Measures the consistency of a particular variable’s coefficient derived from panel regression; a T-Statistics of 1.7 or higher in absolute value means a particular variable’s coefficient is highly consistent throughout the study time period

METHODOLOGY

We have adopted a systematic and quantitative methodology in our quest (1) to identifying Capital Appreciation potentials among 35 core Chinese cities, (2) to understanding the dynamics of the residential market fluctuation from 2006 to 2009, and (3) to predicting the short-term market movement. During the course of our research, we have applied conventional panel regression modeling technique with the help of RATS, a regression analysis software program. Our regression analyses were conducted based on a series of both National and city-level economic and demographic data that span over a 9-year period for the study on annual Capital Appreciation potentials and a 41-month period on 14 Chinese cities for the study on short-term residential market cycle and PRC government policy impact on residential prices, creating a total of 315 and 574 data observations, respectively.

For the study on Capital Appreciation potentials, the independent variables were tested and selected for their relevance to the prediction of Average Sales Price. The regression models were then tested for its effectiveness and selected to predict the Average Sales Prices for the 35 cities over a 5-year period from 2008 to 2012. The difference between the Average Sales Prices in 2012F and 2007A shall determine the Capital Appreciation potentials of each of the 35 Chinese cities in 2007. The limitation of the Capital Appreciation study is that its regression models could not take into consideration of China's residential market downturn in 2008 and 2009, which may potentially inflated the Average Sales Price forecast for each of the 35 Chinese cities.

The study on the residential market cycle, the 14 Chinese cities will be assessed over a 41-month period from January 2006 to May 2009. However, this study will be limited by insufficient monthly city-level data except Average Sales Price and residential transactions ("Sales"), a potential weakness that could make the panel regression models less city-specific. Despite of the modeling handicap, the 14-cities study shall be able to reveal a relatively good indication of the short-term impact of policy and economic changes on Average Sales Price. A 12-month Average Sales Price forecast for each of the 14 cities were also conducted based on the 41-month data.

PANEL REGRESSION ANALYSIS

The purpose of panel regression analysis is to identify the Coefficients of the independent variables for prediction. Ideally, an independent regression model should be

established for each city for more accurate prediction results. However, given the data limitations on our research, we could only apply cross-section analysis by categorizing the cities into groups of similar economic fundamental.

In particular, fixed effect modeling technique was used in our regression analyses, based on the assumption that changes within a group of independent variables shall have a linear relationship with dependant variables, regardless of city-specific attributes. This assumption should be fairly accurate in determining the outcomes of the dependent variables, as residential purchasing behaviors are more or less similar across China. In order to strengthen our models' accuracies, our selections of cities were categorized into tiers of similar economic fundamentals when conducting the regression analyses.

MARKET SELECTION

35 Chinese cities have been selected for our study on Capital Appreciation potentials **(Exhibit 2.1)**. Out of the 660+ cities in China, we decided to conduct further research on these 35 cities, as these 35 cities represents the core and up-and-coming Chinese cities that will more likely cater towards the appetites of both domestic and foreign investors, in line with a list of Chinese cities recommended by a Jones Lang LaSalle report in 2007 "CHINA 30 – China's Rising Urban Stars", that highlighted 30 Tier II and Tier III cities with the most promising real estate market outlook for real estate occupiers, investors, and developers.

Exhibit 2.1A: 35 Chinese Cities Coverage for Identifying Capital Appreciation Potentials

Beijing (北京)	Haikou (海口)	Nanjing (南京)	Tianjin (天津)
Changchun (长春)	Hangzhou (杭州)	Nanning (南宁)	Urumqi (乌鲁木齐)
Changsha (长沙)	Harbin (哈尔滨)	Ningbo (宁波)	Wuhan (武汉)
Chengdu (成都)	Hefei (合肥)	Qingdao (青岛)	Xiamen (厦门)
Chongqing (重庆)	Hohhot (呼和浩特)	Shanghai (上海)	Xian (西安)
Dalian (大连)	Jinan (济南)	Shenyang (沈阳)	Xining (西宁)
Fuzhou (福州)	Kunming (昆明)	Shenzhen (深圳)	Yinchuan (银川)
Guangzhou (广州)	Lanzhou (兰州)	Shijiazhuang (石家庄)	Zhengzhou (郑州)
Guiyan (贵阳)	Nanchang (南昌)	Taiyuan (太原)	

Exhibit 2.1B: Location of 35 Chinese Cities

More importantly, the selected 35 cities is the only group of Chinese cities where we can obtain consistent and comparable data since the Chinese residential market commercialization began in 1998. The quantitative data of the 35 Chinese cities applied in our research are extracted from the State Information Center (国家信息中心) via realestate.cei.gov.cn, a PRC government affiliated real estate intelligence website.

14 Chinese cities have been selected for the study on policy impact and short-term residential market cycle, listed as follows **(Exhibit 2.2)**:

Exhibit 2.2: 14 Cities Coverage for Assessing the Impact on Policy Changes

1	Shenzhen	4	Foshan	7	Suzhou	10	Beijing	13	Chengdu
2	Guangzhou	5	Shanghai	8	Hangzhou	11	Tianjin	14	Wuhan
3	Dongguan	6	Wuxi	9	Nanjing	12	Shenyang		

MODEL LIMITATIONS

Market prediction has always been a mixture of science and art, there is never guarantee that any models in this world can accurately predict the outcomes of future events. As such, any market prediction should be viewed as an indication of general future trend rather than having complete reliance on the results.

Despite the nature of prediction, we can minimize the risk of error by having a better understanding of market behaviors and making rational assumptions on the independent variables. However, there is situation where certain degree of risks cannot be eliminated and we are here to inform certain imperfections in our regression models.

The data on the 35-city and 14-city study are extracted from different PRC government sources. The 35-city annual data are extracted from realestate.cei.gov.cn; whereas, the 14-city monthly data are taken from each of the 14 cities' Housing Management Bureau ("HMB"). The two sets of data sources may create conflicting data for 2006 and 2007; however, the differences are minimal and do not result in conflicting market trends; hence the validity of our analyses is still intact.

To the best of our knowledge, the key economic and demographic indicators of all 39 Chinese cities applied in our regression analysis appear reasonable but contains the following data limitations.

Data Series

The accuracy of panel regression analyses is heavily dependent on sufficient periods of data observations, in which a relatively applicable model typically takes into consideration of 20-40 periods of data observations. The regression models we used for identifying Capital Appreciation potentials among the 35 Chinese cities could only apply 8 to 9 years of data observations, amid the relatively recent commercialization of the Chinese residential market which has only commenced in 1998. As such, our models could not possibly take into consideration of a full residential market cycle in China, which may significantly affect the accuracies of our results.

Moreover, 35 cities regression models could not accurately reflect the Chinese residential market correction in 2008 and 2009 triggered by the global economic crisis, due to a lag in the Chinese governmental statistics bureaus of releasing timely economic and demographic data, which may significantly affect the accuracies of our prediction results.

Data Representation

The Population data we applied in our regression models is registered population rather than the conventionally used total population (i.e. registered population + mobile population), as the applicable total population data does not produce sufficient years of data observations for regression modeling. As such, the GDP per Capita data is also derived from registered population.

We have made the assumption that registered population should be as applicable as total population in our regression models, as registered population should contribute to most of the residential demands based on the theory that mobile population typically does not have location loyalty.

Data Accuracy

There is no guarantee that our data source is reliable even if it is officially provided by the PRC government. Due to the emerging market status of China, it is not improbable that the PRC government may be using different data compilation techniques over the course of our regression analysis period. Despite of the fact, we have only applied data in our regression analysis that are frequently utilized and scrutinized by the international community, minimizing any data discrepancies across our study period. Moreover, we have also conducted preliminary screening on all the data utilized in our regressions to eliminate any data irregularities.

Data Selection

Our regression models are condensed for the purpose of more efficient and effective forecasting of future behaviors of our selected few independent variables. There could be other significant economic and demographic determinants of Average Sales Price and Average Sales Price Growth that we did not include in our regression models, which could potentially yield more accurate prediction results.

Data Distortion

The population data irregularities for the cities, Shenzhen and Chongqing, may potentially distort our prediction results; however, we have decided to include those two cities in our regression analyses as they have two of the more important residential markets in China.

Shenzhen's registered population is approximately 2.1 million in 2007, compared to its total population of approximately 8.5 million in the same year; whereas, the differences between registered population and total population for the remaining 34 Chinese cities under research are typically not more than 30% of registered population.

Chongqing's registered population of 32.4 million in 2007 also represents a significant irregularity in our research, as the territorial size of Chongqing is comparable to a province rather than be considered as a city.

MARKET SEGMENTATION

During the course of our regression analysis, we have divided the 35 Chinese cities into four tiers **(Exhibit 2.3)**. We believe it is more appropriate to analyze the cities by four tiers, as each tier of cities represent a different economic and development pace, which in turn will provide a more accurate result for the cities in each of the four tiers when conducting regression analysis.

According to the Jones Lang LaSalle report:

Tier I cities are maturing cities, with strong demand for not only real estate, but also economic excellence, some history of property performance and have proven interest by institutional investors. At Tier I cities, marketing campaigns are international and these cities cater as the gateways to China for foreign investors. Tier I cities shall house many multi-national corporations and international brands and shall have a dynamic and relatively cosmopolitan environment.

Tier II cities are growth cities and have been successful in growing their indigenous businesses and in attracting foreign direct investments and new companies. Tier II cities typically have very influential mayors or effective municipal governments and clear strategies for the future. They shall have created strong demand in real estate markets driven by the entrance of manufacturing firms, banks, retailers, and hotel operators. Construction levels in Tier II shall be high and property prices shall have undergone rapid growth in recent years, although some cities may now be overheated. Domestic and opportunistic cross border investors shall have an active interest in these markets where transparency and liquidity levels are improving.

Tier III cities are early adopters cities, where they are still in the stage of developing a firm strategic position for their future and setting in place the conditions to create a solid economic profile. Tier III shall be beginning to have early achievement at creating real estate demand from hotel operators, foreign corporate and retailers, and may already have secured a number of international projects although the need for market transparency are still considered a new concept.

Tier IV cities are the outlaws cities not covered and categorized by the Jones Lang LaSalle report. We consider this group of cities to be sub-Tier III as they possess some similarities with Tier III but are typically one-step behind in various economic developments, just outside the scope of typical investors.

Exhibit 2.3: 35 Chinese Cities Categorization

Tier I Cities	Tier II Cities	Tier III Cities	Tier IV Cities
Beijing	Chengdu	Changchun	Guiyan
Guangzhou	Chongqing	Changsha	Haikou
Shanghai	Dalian	Fuzhou	Hohhot
Shenzhen	Hangzhou	Harbin	Lanzhou
	Nanjing	Hefei	Shijiazhuang
	Qingdao	Jinan	Taiyuan
	Shenyang	Kunming	Urumqi
	Tianjin	Nanchang	Xining
	Wuhan	Nanning	Yinchuan
	Xiamen	Ningbo	
	Xian	Zhengzhou	

CHAPTER III

UNDERSTANDING AND FORECASTING RESIDENTIAL PRICE APPRECIATION WITH RESPECT TO ECONOMIC GROWTH

SELECTION OF INDEPENDENT VARIABLES FOR REGRESSION ANALYSIS

In order to select the appropriate independent variables for regression analysis, we have tested the relationships of 45 potential residential price drivers with Average Sales Price **(Appendix A)**.

The 45 potential residential price drivers are classified under 8 major categories, namely Direct Residential Demand, Personal Wealth, Supply, City Wealth, City Power, Foreign Interest, Luxury Development Potentials, and National Wealth. We believe each category independently represents a major driver to Average Sales Price and our intention is to have at least one variable from each of the categories be represented in our regression analysis for completeness.

A straightforward correlation between Average Sales Price and each of the potential independent variables for all 35 Chinese cities is conducted, producing over 1,600 data set. After which, an average correlation is calculated to determine the overall strength of the relationship for each of the potential independent variables, based on the 35 correlation results from each of the Chinese cities under research. A standard deviation is then calculated from each group of the 35 correlation results, to determine the correlation consistency of each of the potential independent variables among the 35 Chinese cities. The variables with rounded-up average correlation of 0.9 or above and standard deviation of less than 20% will then be considered in the secondary screening **(Exhibit 3.1)**.

Exhibit 3.1: Correlation and Standard Deviation of Variables w/Average Sales Price

Potential Independent Variable		Avg Correl	Std Dev
City Power:			
1. GDP (real)	(地区生产总值)	0.91	0.13
2. Freight volume	(货运总量)	0.74	0.36
3. Import export transacted (real)	(进出口总额)	0.85	0.16
City Wealth:			
4. Population density	(人口密度)	0.68	0.48
5. Total road area - urban	(年末实有城市道路面积 - 市辖区)	0.79	0.19
6. Infrastructure invest - public trans (real)	(城市建设固定资产投资 - 公共交通)	0.30	0.47
7. Infrastructure invest - roads & bridges (real)	(城市建设固定资产投资 - 道路桥梁)	0.52	0.52
8. City revenue (real)	(地方财政收入)	0.92	0.11
9. City revenue - urban (real)	(地方财政收入 - (市辖区)	0.89	0.15
10. City spending (real)	(地方财政支出)	0.92	0.09
11. City spending - urban (real)	(地方财政支出 - 市辖区)	0.89	0.14
Direct Residential Demand:			
12. Population - registered	(年末总人口)	0.87	0.16
13. Urban population	(非农人口)	0.86	0.19
14. Household	(年末总户数)	0.74	0.37
15. Employment	(年末从业人员数)	0.21	0.61
16. Unemployment	(年末城镇失业人数 - 登记)	0.30	0.45
17. Mkt residential sales area	(商品住宅销售面积)	0.85	0.17
18. Mkt residential sales (real)	(商品住宅销售额)	0.93	0.09
19. Mkt office ongoing construction area	(办公楼施工面积)	0.43	0.59
20. Mkt office completed construction area	(办公楼竣工面积)	0.20	0.44
21. Mkt office started construction area	(办公楼新开工面积)	0.31	0.45
22. Mkt office sales area	(办公楼销售面积)	0.50	0.41
23. Mkt office sales (real)	(办公楼销售额)	0.59	0.39
24. Mkt office average sales (real)	(办公楼平均销售价格)	0.57	0.31
Foreign Interest:			
25. FDI utilized (real)	(当年实际利用外资金额)	0.65	0.35
26. FDI utilized - urban (real)	(当年实际利用外资金额 - 市辖区)	0.66	0.30
27. Total passengers	(客运总量)	0.71	0.35
28. Air passengers	(航空客运总量)	0.82	0.30
Luxury Development Potentials:			
29. Mobile subscriber	(移动电话用户数)	0.87	0.14
30. Mobile subscriber - urban	(移动电话用户数 - 市辖区)	(0.15)	0.23
31. Internet subscriber	(互联网用户数)	0.57	0.36
National Wealth:			
32. Shanghai Composite Index (real)		0.71	0.13
33. Prime Rate (real)		(0.54)	0.12
34. Shanghai Composite Index return (real)		0.58	0.12
Personal Wealth:			
35. Average salary (real)	(职工平均工资)	0.88	0.15
36. Savings (real)	(城乡居民年底储蓄余额)	0.86	0.15
37. Average consumer spending (real)	(城镇居民人均消费性支出)	0.89	0.13
38. Average disposable income (real)	(城镇居民人均可支配收入)	0.91	0.12
39. GDP per capita (real)	(人均地区生产总值)	0.88	0.16
Supply:			
40. Mkt residential ongoing construction area	(商品住宅施工面积)	0.86	0.17
41. Mkt residential completed construction area	(商品住宅竣工面积)	0.63	0.35
42. Mkt residential start construction area	(商品住宅新开工面积)	0.75	0.29
43. Land acquisition area	(房地产开发购置土地面积)	0.25	0.44
44. Land completion area	(房地产企业完成开发土地面积)	0.25	0.54
45. Cumulative supply (sqm)		0.90	0.12

The secondary screening of the potential independent variables involves the selection of independent variables from each of the variable categories and making sure that the final variables applied in the regression analysis will have sufficient, consistent, and relatively presentable years of observation.

Out of the 19 potential variables that have met our standard from the preliminary screening, we have only selected 4 independent variables to create our regression model; those variables are GDP per Capita, Population, Prime Rate, and Shanghai Composite Index, which represents 4 out of our 8 major variable categories, namely Personal Wealth, City Power, Direct Residential Demand, and National Wealth.

The reason for the limited selections is multi-folded, amid issues stemming from representation significance, time series limitations, reliability, and forecast difficulties. Most importantly, we have obtained assurance from a leading economist that our condensed selection shall be able to provide a relatively academic indication to the medium-term trend of Average Sales Price among the 35 Chinese cities.

Final Independent Variable Selections

GDP per Capita

GDP is generally regarded as a good indicator to measure a region's economic power and its measurement on a per capita basis can serve as a good proxy to personal wealth. The higher the GDP per Capita typically translate into the greater the purchasing power and the higher the quality of living, and ultimately driving up Average Sales Price.

Other than GDP per Capita, we have also considered similar proxies that represent personal wealth, such as average disposable income, average consumer spending, savings, and Average Salary. We have to rule them all out at the end because of several aspects, including but not limited to time series insufficiencies, data unreliability, data inconsistencies, data misrepresentations, and forecast difficulties.

Population

Population is one of the most direct determinants of residential demand. In a typical situation, the greater the Population, the higher should the demand for residential. Ultimately, Average Sales Price should increase, based on the assumption that residential supply growth is slower than Population growth.

We could not obtain sufficient years of data observation for total population (i.e. registered population + mobile population), hence we used registered population in our regression models instead.

We have made the assumption that registered population should be as applicable as total population for our regression models, as registered population is believed to contribute to most of the residential demands based on the theory that mobile population typically does not have location loyalty. More importantly, the correlation between registered population and total population for our 35 Chinese cities is extremely high at 0.95+.

Prime Rate

Mortgage Prime Rate is a significant determinant of residential demand as many economists have suggested. Prime Rate is typically utilized by country governments as a fiscal policy to controlling the demand for residential properties. The higher the Prime Rate typically leads to lower demand for residential amid the increase in cost of capital, and ultimately decreases Average Sales Price.

Shanghai Composite Index

The inclusion of Shanghai Composite Index in our regression model is based on our theory that it is a proxy to National wealth. Our theory is that the higher the Shanghai Composite Index, the higher the overall National wealth and personal wealth levels, leading to the ability and greater appetite to purchasing more residential and ultimately driving up Average Sales Price.

Stock market is one of the largest investment mediums in China other than residential market and according to a report by China Securities Depository and Clearing Corporation Limited in 2009, retail stock trading accounts have reached 100 million in China.

SELECTION OF REGRESSION MODEL

Once we have selected the appropriate group of independent variables, we went on to conduct a series of regression analysis in order to derive the relevant independent variables' coefficient for our Average Sales Price forecasting. To determining the final

regression model to be used for forecasting, we have conducted five regression analyses to test the applicability and accuracy of our methodology.

Our regression models are all based on the principle where the dependent variable on the left side of the equation is determined from the summing of the group of independent variables on the right side of the equation.

Price Level Equation:

Average Sales Price = City Constant + (β_1)*GDP per Capita + (β_2)*Population + (β_3)*Prime Rate + (β_4)*Shanghai Composite Index

Price Growth Equation:

Average Sales Price Growth = City Constant + (β_1)*GDP per Capita Growth + (β_2)*Population Growth + (β_3)*Prime Rate + (β_4)*Shanghai Composite Index

The five regression analyses are conducted in the following order:

"Regression (A)" Single-Tier Regression to determine Average Sales Price based on GDP per Capita, Population, Prime Rate, and Shanghai Composite Index

"Regression (B)" Single-Tier Regression to determine Average Sales Price based on Average Salary, Population, Prime Rate, and Shanghai Composite Index

"Regression (C)" 4-Tier Regression to determine Average Sales Price based on GDP per Capita, Population, Prime Rate, and Shanghai Composite Index

"Regression (D)" Single-Tier Regression to determine Average Sales Price Growth based on GDP per Capita Growth, Population Growth, Prime Rate, and Shanghai Composite Index

"Regression (E)" 4-Tier Regression to determine Average Sales Price Growth based on GDP per Capita Growth, Population Growth, Prime Rate, and Shanghai Composite Index

Regression (A) and Regression (B) Results

Both Regression (A) and Regression (B) are conducted with the assumption that all 35 Chinese cities shall be observed as a single group, rather than recognizing any differences or similarities among the cities; hence, the results from Regression (A) and Regression (B) are statistically not as accurate.

The primary purpose of Regression (A) and Regression (B) is to conduct preliminary check to make sure all independent variables behave in the appropriate positive or negative manners with Average Sales Price, as most economists would expect. For example, under an efficient market hypothesis, a higher Prime Rate typically leads to lower purchasing demand for residential properties amid the higher cost of capital, thus Average Sales Price shall decline to lure potential buyers, and vice versa.

From our results, we observed that all independent variables from the two models create relevant relationships with Average Sales Price **(Exhibit 3.2)**. In particular, GDP per Capita, Average Salary, Population, and Shanghai Composite Index all have positive impacts on Average Sales Price; whereas, Prime Rate has a negative impact on Average Sales Price. We believe these relationships are valid, as higher GDP per Capita, Average Salary, and Shanghai Composite Index all translate to higher personal wealth level, which subsequently enhances the ability to pay more for residential properties. A higher Population also translates to a higher Average Sales Price, with the assumption that the residential supply growth remains below Population growth. On the other hand, a higher Prime Rate shall negatively impact the demand for residential properties, leading to a lower Average Sales Price.

The secondary purpose of conducting Regression (A) and Regression (B) is to determine whether GDP per Capita or Average Salary is a more accurate measure in forecasting future Average Sales Price for the Chinese cities. It is not necessary to include both independent variables under the same model, because GDP per Capita and Average Salary both implies a good proxy to self-inflicted personal wealth.

From our results, we observed that Regression (A) is a better measure in predicting Average Sales Price amid its higher R-Squared of 0.90 to Regression (B)'s 0.87, meaning Regression (A) can relate to 90% of its data trend compared to Regression (B)'s 87%. To better support the application of GDP per Capita over Average Salary, the absolute values of the T-Statistics of Regression (A)'s independent variables are all significant and higher than Regression (B)'s, meaning Regression (A)'s combination of independent variables is a better

determinant of Average Sales Price than Regression (B)'s. Hence GDP per Capita is the preferred independent variable over Average Salary in our quest to forecast future Average Sales Price.

Exhibit 3.2A: Regression (A) Results – GDP per Capita

Regression (A)				
Dependent Variable: Average Sales Price				
Usable Observations: 315			Degrees of Freedom: 276	
Centered R^2: 0.895830			R Bar^2: 0.881488	
Uncentered R^2: 0.976380			T x R^2: 307.560	
Mean of Dependent Variable: 3028.6993953				
Std Error of Dependent Variable: 1642.6900765				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita	0.0368	0.00271	13.58084	0
Population	4.90833	1.2803	3.83373	0.00015638
Shanghai Index	4.14099	0.7119	5.81678	0.00000002
Prime Rate	-84.49525	25.08265	-3.36867	0.0008629
Beijing	-808.23012	1522.16034	-0.53098	0.59586264
Changchun	-1602.92315	966.74956	-1.65805	0.09844259
Changsha	-1259.68318	827.25212	-1.52273	0.1289707
Chengdu	-3078.20197	1384.38679	-2.22351	0.02699088
Chongqing	-13752.80331	4050.98777	-3.39493	0.00078727
Dalian	-269.54414	768.47803	-0.35075	0.72604301
Fuzhou	-691.68553	825.09224	-0.83831	0.40258037
Guangzhou	-158.38966	970.22113	-0.16325	0.87044021
Guiyan	-1.69275	514.4394	-0.00329	0.99737697
Haikou	1405.1007	297.70846	4.71972	0.00000376
Hangzhou	203.56124	869.15847	0.2342	0.81499949
Harbin	-2583.52396	1267.14331	-2.03886	0.04241703
Hefei	-159.96845	641.62932	-0.24932	0.8033018
Hohhot	-21.80962	374.02852	-0.05831	0.95354385
Jinan	-888.30933	796.35888	-1.11546	0.26562209
Kunming	-324.46768	695.97694	-0.4662	0.64143676
Lanzhou	318.13929	469.25883	0.67796	0.49836424
Nanchang	-307.58089	646.61615	-0.47568	0.63468027
Nanjing	-166.2706	785.93553	-0.21156	0.83260836
Nanning	-578.28557	835.14157	-0.69244	0.48924311
Ningbo	-356.6486	755.2124	-0.47225	0.63712196
Qingdao	-1397.32401	972.47751	-1.43687	0.15188747
Shanghai	-2789.13155	1738.32799	-1.60449	0.1097495
Shenyang	-1039.8066	931.99829	-1.11567	0.26553198
Shenzhen	-1145.96615	662.19618	-1.73055	0.08464908
Shijiazhuang	-2866.78541	1210.63657	-2.368	0.01857402
Taiyuan	398.30416	495.9302	0.80315	0.42258168
Tianjin	-2033.71955	1224.63403	-1.66068	0.09791423
Urumqi	472.00849	346.89963	1.36065	0.17473486
Wuhan	-1785.81857	1042.60366	-1.71285	0.08786407
Xiamen	1849.21266	340.21559	5.43541	0.00000012
Xian	-1447.50993	967.62344	-1.49594	0.13581097
Xining	734.89573	338.73116	2.16955	0.03089396
Yinchuan	1028.41387	293.14667	3.50819	0.00052656
Zhengzhou	-1374.00832	893.62771	-1.53756	0.12530126

Exhibit 3.2B: Regression (B) Results – Average Salary

Regression (B)				
Dependent Variable: Average Sales Price				
Usable Observations: 315			Degrees of Freedom: 276	
Centered R^2: 0.866491			R Bar^2: 0.848109	
Uncentered R^2: 0.969727			T x R^2: 305.464	
Mean of Dependent Variable: 3028.6993953				
Std Error of Dependent Variable: 1642.6900765				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
Average Salary	0.089306	0.009788	9.12443	0
Population	2.430609	1.586209	1.53234	0.12658453
Shanghai Index	4.060841	0.833632	4.87127	0.00000187
Prime Rate	-48.194836	31.07895	-1.55072	0.12211401
Beijing	871.454255	1779.246935	0.48979	0.62467281
Changchun	-630.852959	1127.602277	-0.55946	0.57629876
Changsha	-845.050522	950.44927	-0.88911	0.37472016
Chengdu	-1462.255096	1633.906467	-0.89494	0.37159672
Chongqing	-7125.457258	4934.747856	-1.44394	0.14989129
Dalian	475.020679	882.323787	0.53837	0.5907524
Fuzhou	5.490096	952.664991	0.00576	0.99540607
Guangzhou	993.880414	1112.798659	0.89314	0.37256249
Guiyan	-129.855363	582.455761	-0.22294	0.82374353
Haikou	672.435586	362.472528	1.85514	0.0646431
Hangzhou	703.872154	992.941105	0.70888	0.47899973
Harbin	-1029.370007	1498.428163	-0.68697	0.49268061
Hefei	-111.394816	730.355805	-0.15252	0.87888723
Hohhot	-224.452019	427.441535	-0.52511	0.59993122
Jinan	-184.832348	917.304822	-0.2015	0.84045995
Kunming	-28.851667	796.142878	-0.03624	0.97111774
Lanzhou	169.22436	530.934139	0.31873	0.75017273
Nanchang	-81.375198	738.314197	-0.11022	0.91231693
Nanjing	98.00966	894.859596	0.10953	0.91286554
Nanning	-246.847076	962.392804	-0.25649	0.79776122
Ningbo	1.717336	859.191275	0.002	0.99840665
Qingdao	-248.585288	1132.592774	-0.21948	0.82643576
Shanghai	-316.555709	2045.921343	-0.15473	0.877151
Shenyang	-23.591471	1083.461578	-0.02177	0.98264384
Shenzhen	4500.059682	436.40797	10.31159	0
Shijiazhuang	-1375.402268	1430.322342	-0.9616	0.33709075
Taiyuan	429.787641	561.814564	0.765	0.44492569
Tianjin	-663.130258	1431.225196	-0.46333	0.64349265
Urumqi	59.738586	404.643208	0.14763	0.88274041
Wuhan	-545.283241	1220.473622	-0.44678	0.65538426
Xiamen	2304.701223	386.228132	5.9672	0.00000001
Xian	-676.80834	1125.470049	-0.60136	0.54809638
Xining	-67.905091	393.934809	-0.17238	0.8632679
Yinchuan	299.568393	354.563908	0.84489	0.39890264
Zhengzhou	-482.772728	1039.581149	-0.46439	0.64273333

Regression (C) Results

Regression (C) is conducted with the consideration that a more significant regression can be constructed by grouping the residential markets of the 35 Chinese cities into four separate maturity categories, based on their differences in economic development, cost of living, and various other market drivers. The four market maturity are categorized as 4 Tiers, in line with the categorization method recommended by Jones Lang LaSalle's report in 2007 "CHINA 30 – China's Rising Urban Stars"..

The purpose of Regression (C) is to create a more accurate regression after the group of independent variables has been validated by Regression (A). Regression (C) recognizes the commonalities and differences among the cities within each of the four tiers and can thus yield more accurate results specific to the various attributes of each of the tiers.

R-Squared significance

Based on the results from Regression (C) we observed that the independent variables of all 4 tiers have relatively strong relationships with the historical trends of Average Sales Price, with lowest R-Squared of 0.77 on Tier IV cities and highest R-Squared of 0.89 on Tier II cities.

In particular, Tier I and Tier IV cities are the groups of cities that tend to behave in accordance to the general principal of economics, where GDP per Capita, Population, and Shanghai Composite Index all have positive impacts on Average Sales Price, while Prime Rate has negatively impact on Average Sales Price **(Exhibit 3.3)**.

Prime Rate significance

Tier II and Tier III cities, at first glance, appear to have an abnormal positive relationships between Prime Rate and Average Sales Price; however, as the T-Statistics of Prime Rate for Tier II, Tier III, and Tier IV cities are insignificant (i.e. less than 1.7 in absolute value), the abnormal results merely mean the sensitively of Prime Rate to Average Sales Price are less consistent at Tier II, Tier III, and Tier IV cities; in other words, fluctuation on Prime Rate is not a good determinant of Average Sales Price at Tier I, Tier II, and Tier III cities. Tier I cities' Average Sales Price, on the other hand, is extremely sensitive to Prime Rate fluctuation, as indicated by its Prime Rate coefficient of -274.6152.

GDP per Capita significance

Average Sales Price is roughly three to four times more sensitive to GDP per Capita at Tier II and Tier III cities compared to Tier I and Tier IV cities, as shown by the higher GDP per Capita coefficient at Tier II and Tier III cities of 0.08142 and 0.081678, respectively. GDP per Capita is a significant indicator of Average Sales Price for all four tiers of cities as indicated by their T-Statistics of 1.7 or above.

Population significance

The sensitivity of Population to Average Sales Price is trickier to explain, as Population may varies greatly even among the cities within the same Tier, such as Chongqing with 32.4 million and Xiamen with 1.7 million in Population as of 2007. More important to note is that Population has a positive impact across all tiers of cities.

Shanghai Composite Index significance

Shanghai Composite Index, like Prime Rate, is an exogenous factor at city level. This independent variable is a consistent determinant of Average Sales Price at all tiers of cities except for Tier III cities, where its T-Statistics is only 0.72554. Shanghai Composite Index is roughly four times and eight times more sensitive to Average Sales Price at Tier I cities compared to Tier II and Tier IV cities, respectively.

Exhibit 3.3A: Regression (C) Results – Tier I

Regression (C) - Tier I				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price				
Usable Observations: 36			Degrees of Freedom: 28	
Centered R^2: 0.817111			R Bar^2: 0.771389	
Uncentered R^2: 0.982975			T x R^2: 35.387	
Mean of Dependent Variable: 6162.4748356				
Std Error of Dependent Variable: 2002.3638628				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Signif**
GDP per Capita	0.01911	0.00653	2.92532	0.00675154
Population	11.04675	7.51243	1.47046	0.15258574
Shanghai Index	11.93703	3.74518	3.18731	0.0035162
Prime Rate	-274.6152	131.62067	-2.08641	0.04616834
Beijing	-6542.34803	8841.72831	-0.73994	0.46549577
Guangzhou	-2925.95526	5520.05142	-0.53006	0.60024933
Shanghai	-9356.8353	10114.95234	-0.92505	0.36284441
Shenzhen	2473.04115	1741.59547	1.41999	0.16665102

Exhibit 3.3B: Regression (C) Results – Tier II

Regression (C) - Tier II				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price				
Usable Observations: 99			Degrees of Freedom: 84	
Centered R^2: 0.891695			R Bar^2: 0.873644	
Uncentered R^2: 0.983906			T x R^2: 97.407	
Mean of Dependent Variable: 3173.8351104				
Std Error of Dependent Variable: 1332.6952692				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita	0.08142	0.00774	10.52568	0
Population	5.05428	2.66334	1.89772	0.06116791
Shanghai Index	2.68863	1.20884	2.22414	0.02882152
Prime Rate	18.0922	43.94293	0.41172	0.68159302
Chengdu	-4582.28867	2822.8449	-1.62329	0.10827514
Chongqing	-15024.08048	8398.67762	-1.78886	0.07724186
Dalian	-2322.0013	1516.07575	-1.53159	0.1293821
Hangzhou	-2054.18164	1726.30757	-1.18993	0.23742703
Nanjing	-2174.16398	1553.53491	-1.39949	0.16534682
Qingdao	-3290.19752	1949.15497	-1.68801	0.09511857
Shenyang	-2808.52353	1865.79612	-1.50527	0.13600628
Tianjin	-4056.29481	2476.96892	-1.6376	0.10524525
Wuhan	-3468.01764	2100.65198	-1.65092	0.10248815
Xiamen	-1279.70183	646.01783	-1.98091	0.05087365
Xian	-2677.73387	1951.19174	-1.37236	0.17360547

Exhibit 3.3C: Regression (C) Results – Tier III

Regression (C) - Tier III				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price				
Usable Observations: 99			Degrees of Freedom: 84	
Centered R^2: 0.820704			R Bar^2: 0.790821	
Uncentered R^2: 0.985423			T x R^2: 97.557	
Mean of Dependent Variable: 2555.5278738				
Std Error of Dependent Variable: 764.1082339				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita	0.0816778	0.007728	10.56908	0
Population	1.7014617	0.9876134	1.7228	0.0886042
Shanghai Index	0.6236669	0.8595862	0.72554	0.47013539
Prime Rate	14.3557626	31.1036761	0.46155	0.64560028
Changchun	-565.5357032	758.9943324	-0.74511	0.45828384
Changsha	-586.5631723	656.8532421	-0.89299	0.3744139
Fuzhou	-201.5000244	663.2621776	-0.3038	0.7620304
Harbin	-643.7319091	980.452381	-0.65657	0.51325458
Hefei	255.5569563	512.5017902	0.49865	0.61933207
Jinan	-641.3775401	651.8468343	-0.98394	0.32797111
Kunming	40.9827753	560.6427758	0.0731	0.94190063
Nanchang	-2.2146835	521.9555159	-0.00424	0.99662461
Nanning	571.4292914	648.2568133	0.88149	0.38057019
Ningbo	-679.9132507	655.1534948	-1.03779	0.30234496
Zhengzhou	-562.9196903	706.6069596	-0.79665	0.4278992

Exhibit 3.3D: Regression (C) Results – Tier IV

Regression (C) - Tier IV				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price				
Usable Observations: 81			Degrees of Freedom: 68	
Centered R^2: 0.770549			R Bar^2: 0.730058	
Uncentered R^2: 0.988196			T x R^2: 80.044	
Mean of Dependent Variable: 2036.8429631				
Std Error of Dependent Variable: 477.3062086				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita	0.023619	0.005578	4.23405	0.00007051
Population	6.656044	1.87571	3.54855	0.00070753
Shanghai Index	1.449146	0.667593	2.1707	0.03344854
Prime Rate	-19.699741	23.970371	-0.82184	0.4140419
Guiyan	-656.983035	684.52313	-0.95977	0.34057253
Haikou	1200.583928	323.148069	3.71527	0.00041212
Hohhot	-295.373119	461.857299	-0.63953	0.52462481
Lanzhou	-223.943325	613.346849	-0.36512	0.7161573
Shijiazhuang	-4461.26246	1736.911885	-2.5685	0.01241433
Taiyuan	-129.883573	657.174515	-0.19764	0.84391683
Urumqi	263.777525	416.999648	0.63256	0.52914203
Xining	327.158486	392.672364	0.83316	0.407672
Yinchuan	791.788663	311.88579	2.53871	0.01341996

Regression (D) and Regression (E) Results

The purpose of Regression (D) and Regression (E) is to determine whether price level data or price growth data is a more accurate group of data in forecasting Average Sales Price. As such, Average Sales Price Growth replaces Average Sales Price as the dependent variable of Regression (D) and Regression (E); whereas, GDP per Capita Growth and Population Growth replace GDP per Capita and Population as two of the four independent variables of Regression (D) and Regression (E). The two exogenous independent variables, Prime Rate and Shanghai Composite Index, remain as the same determinants as Regression (A) and Regression (C) for both Regression (D) and Regression (E).

Similar to the primary purpose of Regression (A), the sole purpose of Regression (D) is to ensure all independent variables behave in the appropriate positive or negative manners with Average Sales Price Growth, and fortunately they all do. In particular, GDP per Capita Growth, Population Growth, and Shanghai Composite Index all have positive impacts on Average Sales Price; whereas, Prime Rate has a negative impact on Average Sales Price **(Exhibit 3.4)**. The R-Squareds of Regression (D) and Regression (E) are not as significant to the accuracy of the models as those of Regression (A) and Regression (C), as

the relationships among a group of price growth data do not have a trending effect like the relationships among a group of price level data.

Any two series of price level data when placed alongside each other will generally show upward trends over an extended period of time due to inflation, the nature of economy, and the exponential growth of population; as such, a comparison between two group of price level data over time shall typically show two parallel upward trends, resulting in a higher correlation (i.e. R-Squared), without regard to the actual relationship between the two data sets' periodic growth rates. As such, the correlation between the growth rates may potentially be a better measure of the actual relationship between any two sets of data. To determine the accuracy between the models created by price level data and price growth data, we can apply "Back-Sample Testing", which will be explained in detail in the latter part of this section.

Once the applicable of price growth data has been validated by the positive results of Regression (D), we then moved on to conduct the final regression, Regression (E), in order to derive more accurate coefficient results for the four tiers of cities.

R-Squared significance

From the results of Regression (E), we observed that our collective group of independent variables, GDP per Capita Growth, Population Growth, Shanghai Composite Index, and Prime Rate, has the strongest correlation with Tier I cities' Average Sales Price, as determined by Tier I cities' highest R-Squared of 0.52, among the 4 tiers of cities **(Exhibit 3.5)**. Tier II cities rank second in terms of correlation with the collective group of independent variables, with a R-Squared of 0.40; whereas, Tier III and Tier IV cities' Average Sales Prices are relatively insensitive to the changes to the same group of independent variables, with R-Squareds of only 0.17 and 0.16, respectively in comparison.

In particular, GDP per Capita Growth, Shanghai Composite Index, and Prime Rate create the most impacts on Tier I cities' Average Sales Price, amid its highest Coefficients of 0.34, 0.12, and -2.72, respectively among the 4 tiers of cities; whereas, Tier II cities' Average Sales Price are most sensitive to the changes in Population, with a sensitivity ratio of 10.49% change in Average Sales Price for every 1% change in Population, as indicated by its Coefficient.

Prime Rate significance

Tier I cities' Average Sales Price are most sensitive to the changes in Prime Rate, with a change of -2.72% in Average Sales Price for every 1% point increase in Prime Rate; in comparison, Prime Rate only affects those of Tier II, Tier III, and Tier IV cities by -1.03%, -1.00%, and -0.80%, respectively.

Population Growth significance

Changes in Population appears to create the second greatest impact on Average Sales Price for all tiers of cities, except for Tier II cities, given its second highest Coefficient for most tiers; however, the impact of the changes in Population on Tier III and Tier IV cities is low, as indicated by their respective T-Statistics of only 0.68 and 0.51, which are significantly below the significance standard of 1.7 in absolute value.

GDP per Capita Growth significance

The impact from the changes in GDP per Capita is highest on Tier II cities with a 0.47% change in its Average Sales Price for every 1% change in its GDP per Capita; in comparison, the impact on Tier I cities' Average Sales Price is 0.34%. On the other hand, Tier III and Tier IV cities' Average Sales Prices are insensitive to the changes in their respective GDP per Capitas, as indicated by each of their low combination of T-Statistics and Coefficients.

Shanghai Composite Index significance

Tier I cities' Average Sales Price are most sensitive to the changes in Shanghai Composite Index among the 4 tiers of cities, with a Coefficient of 0.12; in comparison, the Average Sales Prices of the rest of the tiers are relatively insensitive to the changes in Shanghai Composite Index, as indicated by their significantly lower Coefficients of no more than 0.04 and low T-Statistics.

Exhibit 3.4: Regression (D) Results – Price Growth

Regression (D)				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price Growth				
Usable Observations: 280			Degrees of Freedom: 241	
Centered R^2: 0.203467			R Bar^2: 0.077873	
Uncentered R^2: 0.541297			T x R^2: 151.563	
Mean of Dependent Variable: 0.0897973400				
Std Error of Dependent Variable: 0.1048231090				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita Growth	0.044462637	0.100690426	0.44158	0.65919083
Population Growth	0.146389901	0.080560478	1.81714	0.07043719
Shanghai Index	0.036484167	0.011541309	3.16118	0.00177265
Prime Rate	-1.48980981	0.396558268	-3.75685	0.00021585
Beijing	0.146026441	0.045264353	3.22608	0.00142892
Tianjin	0.162363274	0.04331215	3.74868	0.0002226
Shijiazhuang	0.06906365	0.041806879	1.65197	0.09984323
Taiyuan	0.171079988	0.043503819	3.93253	0.00010993
Hohhot	0.129247592	0.04865701	2.6563	0.00842783
Shenyang	0.081177114	0.042853758	1.89428	0.05938487
Dalian	0.154130434	0.042709769	3.60879	0.00037407
Changchun	0.109168501	0.042427319	2.57307	0.01067953
Harbin	0.099702989	0.042111426	2.3676	0.01869452
Shanghai	0.163690962	0.042578793	3.84442	0.00015466
Nanjing	0.109397849	0.043305461	2.52619	0.0121724
Hangzhou	0.174030831	0.042967954	4.05025	0.00006902
Ningbo	0.203301483	0.043014614	4.72634	0.00000389
Hefei	0.116939195	0.044839601	2.60794	0.00967758
Fuzhou	0.173500851	0.04109276	4.22218	0.00003431
Xiamen	0.193888692	0.042072092	4.60849	0.00000658
Jinan	0.137634041	0.042301564	3.25364	0.00130258
Qingdao	0.181698814	0.043738963	4.15416	0.00004536
Guangzhou	0.136054736	0.043055598	3.15998	0.00177969
Shenzhen	0.16162721	0.043698401	3.6987	0.00026843
Nanchang	0.179265952	0.043035804	4.16551	0.0000433
Zhengzhou	0.142506375	0.04363782	3.26566	0.00125079
Wuhan	0.163370872	0.042201378	3.87122	0.0001395
Changsha	0.129155269	0.04359707	2.96248	0.00335715
Nanning	0.109859397	0.044920323	2.44565	0.01517558
Haikou	0.104623099	0.044139005	2.37031	0.01856123
Chongqing	0.150689299	0.042184496	3.57215	0.00042744
Chengdu	0.162338721	0.042075288	3.85829	0.00014663
Guiyan	0.115781898	0.042243264	2.74084	0.00658728
Kunming	0.103282918	0.041456274	2.49137	0.01339888
Xian	0.175480823	0.042144671	4.16377	0.00004361
Lanzhou	0.119782113	0.041858984	2.86156	0.00458602
Xining	0.104713335	0.044073822	2.37586	0.01829071
Yinchuan	0.094701716	0.044195152	2.14281	0.03313055
Urumqi	0.089191523	0.042220387	2.11252	0.03567057

Exhibit 3.5A: Regression (E) Results – Price Growth (Tier I)

Regression (E) - Tier I				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price Growth				
Usable Observations: 32			Degrees of Freedom: 24	
Centered R^2: 0.521548			R Bar^2: 0.381999	
Uncentered R^2: 0.724722			T x R^2: 23.191	
Mean of Dependent Variable: 0.1042314229				
Std Error of Dependent Variable: 0.1232663827				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita Growth	0.341802265	0.20339639	1.68047	0.10583661
Population Growth	1.354436868	0.786552503	1.72199	0.09793676
Shanghai Index	0.118159691	0.033637032	3.51279	0.00178499
Prime Rate	-2.716914202	1.18437982	-2.29396	0.03084772
Beijing	0.125803759	0.076461405	1.64532	0.11293864
Guangzhou	0.112133521	0.0756564	1.48214	0.15131483
Shanghai	0.153462661	0.072007599	2.1312	0.04351525
Shenzhen	0.071503046	0.10375078	0.68918	0.49731899

Exhibit 3.5B: Regression (E) Results – Price Growth (Tier II)

Regression (E) - Tier II				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price Growth				
Usable Observations: 88			Degrees of Freedom: 73	
Centered R^2: 0.404211			R Bar^2: 0.289950	
Uncentered R^2: 0.714204			T x R^2: 62.850	
Mean of Dependent Variable: 0.1053476060				
Std Error of Dependent Variable: 0.1017321431				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita Growth	0.46588747	0.31308881	1.48804	0.14104858
Population Growth	10.49142173	2.09599352	5.00546	0.00000373
Shanghai Index	-0.01073656	0.01825381	-0.58818	0.55822541
Prime Rate	-1.03453615	0.62846853	-1.64612	0.10403755
Chengdu	-0.02377169	0.0665366	-0.35727	0.72191874
Chongqing	0.02872138	0.06155729	0.46658	0.6421901
Dalian	0.01682539	0.06558391	0.25655	0.79824978
Hangzhou	-0.00321507	0.07010589	-0.04586	0.96354687
Nanjing	-0.13697475	0.07866592	-1.74122	0.08585766
Qingdao	0.01153736	0.0734069	0.15717	0.87554476
Shenyang	-0.04330158	0.06554833	-0.66061	0.51094472
Tianjin	0.02610762	0.06881827	0.37937	0.7055141
Wuhan	-0.03657264	0.06860746	-0.53307	0.59560367
Xiamen	-0.19565319	0.09476554	-2.0646	0.04251374
Xian	-0.03987453	0.07007761	-0.56901	0.57109918

Exhibit 3.5C: Regression (E) Results – Price Growth (Tier III)

Regression (E) - Tier III				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price Growth				
Usable Observations: 88			Degrees of Freedom: 73	
Centered R^2: 0.174263			R Bar^2: 0.015902	
Uncentered R^2: 0.544266			T x R^2: 47.895	
Mean of Dependent Variable: 0.0884420029				
Std Error of Dependent Variable: 0.0987173162				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita Growth	0.019473992	0.198089736	0.09831	0.92195642
Population Growth	0.09810777	0.143469486	0.68382	0.49625177
Shanghai Index	0.030204418	0.019952138	1.51384	0.13438331
Prime Rate	-1.002723821	0.699972566	-1.43252	0.15626387
Changchun	0.092356963	0.05582942	1.65427	0.10236648
Changsha	0.113197873	0.059464888	1.90361	0.06090336
Fuzhou	0.155528674	0.051410026	3.02526	0.00342864
Harbin	0.082589329	0.054809352	1.50685	0.13616519
Hefei	0.101789786	0.063159367	1.61163	0.11135715
Jinan	0.120751497	0.055430189	2.17844	0.03260276
Kunming	0.085728879	0.052658579	1.62801	0.10783071
Nanchang	0.163203984	0.057770086	2.82506	0.00609214
Nanning	0.099465952	0.062807719	1.58366	0.11759455
Ningbo	0.186773484	0.057658522	3.2393	0.00180492
Zhengzhou	0.12679461	0.059610382	2.12706	0.03679477

Exhibit 3.5D: Regression (E) Results – Price Growth (Tier IV)

Regression (E) - Tier IV				
Linear Regression - Estimation by Least Squares				
Dependent Variable: Average Sales Price Growth				
Usable Observations: 72			Degrees of Freedom: 59	
Centered R^2: 0.159618			R Bar^2: -0.011307	
Uncentered R^2: 0.401326			T x R^2: 28.895	
Mean of Dependent Variable: 0.0660328345				
Std Error of Dependent Variable: 0.1046518173				
Variable	**Coefficient**	**Std Error**	**T-Stat**	**Significance**
GDP per Capita Growth	-0.102547334	0.162489699	-0.6311	0.53041218
Population Growth	0.059767509	0.117860815	0.5071	0.61397313
Shanghai Index	0.035497572	0.024359804	1.45722	0.150358
Prime Rate	-0.795535187	0.820139782	-0.97	0.33600657
Guiyan	0.102183198	0.056818293	1.79842	0.07722644
Haikou	0.095934192	0.058648956	1.63574	0.10721925
Hohhot	0.136138762	0.068380208	1.99091	0.05112859
Lanzhou	0.104358436	0.056139564	1.85891	0.06802941
Shijiazhuang	0.053348354	0.056061045	0.95161	0.34517613
Taiyuan	0.162684398	0.059033672	2.75579	0.00777662
Urumqi	0.07572686	0.056536338	1.33944	0.18556549
Xining	0.098524399	0.059728297	1.64954	0.10435119
Yinchuan	0.088941882	0.059990054	1.48261	0.14350001

As mentioned earlier, conducting multiple regression analyses by dividing the 35 Chinese cities into four tiers shall create models with better forecasting abilities, amid the differences in economic development among the four tiers of cities.

From the results of Regression (E), we observed that Tier I and Tier II cities are significantly more sensitive to the changes in GDP per Capita and Population than Tier III and Tier IV cities. If we had applied the model derived from Regression (D) to our Average Sales Price forecasting, the impacts from GDP per Capita and Population on Tier I and Tier II cities would have been significantly underestimated, as determined by the significantly lower GDP per Capita Growth Coefficient of 0.0445 and Population Growth of 0.1464 under Regression (D); whereas, the same impacts on Tier III and Tier IV cities would have been significantly overestimated, potentially resulting in a distorted favoritism for Tier III and Tier IV cities over Tier I and Tier II cities. Moreover, the impacts from Shanghai Composite Index and Prime Rate on Tier I cities would also be underestimated if we had applied Regression (D)'s model, as determined by their respective lower Coefficients of 0.0365 and -1.4898; whereas, the impacts from Shanghai Composite Index on Tier II, Tier III, and Tier IV cities would have been minimal and the impacts from Prime Rate would have been overestimated.

Back-Sample Testing

In order to determine the final regression model to be used for the forecasting of Average Sales Price, we have applied back-sample testing on Regression (C) and Regression (E), which represents the group of price level data and the group of price growth data, respectively.

The back-sample testing is conducted by using the models derived from Regression (C) and Regression (E) and forecasting for the Average Sales Prices in 2007 for all 35 Chinese cities based on actual 2007 GDP per Capita, GDP per Capita Growth, Population, Population Growth, Prime Rate, and Shanghai Composite Index, and then comparing the results to the actual 2007 Average Sales Prices for those same cities. The 1-Year percentage growth in 2007 for both the actual and predicted Average Sales Prices is then calculated, and the correlation between the two groups of price growth data is calculated to determine the forecasting accuracies of each of the models of Regression (C) and Regression (E).

The correlation results have shown Regression (E)'s derived model to be more accurate in forecasting Average Sales Price with a correlation of 0.52, compared to

Regression (C)'s derived model's 0.20; which in effect means the model using price growth data is a more accurate medium in predicting Average Sales Price than the model using price level data **(Exhibit 3.6)**.

Exhibit 3.6: 35 Chinese Cities Average Sales Price - 1-Year Back Sample Testing

City	2006A	2007A	Reg (C) 2007P	Reg (E) 2007P	2007A 1-Yr Gwth	Reg (C) 2007P 1-Yr Gwth	Reg (E) 2007P 1-Yr Gwth
Beijing	7,729	10,661	8,942	9,619	37.9%	15.7%	24.5%
Changchun	2,524	3,118	3,069	2,792	23.6%	21.6%	10.6%
Changsha	2,548	3,191	3,382	2,873	25.3%	32.8%	12.8%
Chengdu	3,667	4,198	3,737	4,040	14.5%	1.9%	10.2%
Chongqing	2,181	2,588	2,630	2,565	18.7%	20.6%	17.6%
Dalian	4,460	5,417	5,273	5,232	21.4%	18.2%	17.3%
Fuzhou	4,167	4,900	3,507	4,873	17.6%	-15.8%	17.0%
Guangzhou	6,447	8,439	7,984	7,953	30.9%	23.8%	23.4%
Guiyan	2,241	2,619	2,289	2,494	16.9%	2.2%	11.3%
Haikou	2,801	3,403	2,922	3,107	21.5%	4.3%	10.9%
Hangzhou	6,253	7,432	6,574	7,035	18.8%	5.1%	12.5%
Harbin	2,623	2,943	3,130	2,874	12.2%	19.3%	9.6%
Hefei	3,012	3,154	3,424	3,365	4.7%	13.7%	11.7%
Hohhot	2,280	2,459	2,448	2,603	7.8%	7.3%	14.2%
Jinan	3,478	3,720	3,926	3,944	6.9%	12.9%	13.4%
Kunming	2,864	2,994	3,216	3,148	4.5%	12.3%	9.9%
Lanzhou	2,636	2,920	2,539	2,942	10.8%	-3.7%	11.6%
Nanchang	3,200	3,509	3,222	3,767	9.7%	0.7%	17.7%
Nanjing	4,475	5,011	5,542	4,747	12.0%	23.8%	6.1%
Nanning	2,783	3,273	3,089	3,103	17.6%	11.0%	11.5%
Ningbo	5,350	6,097	5,328	6,423	14.0%	-0.4%	20.1%
Qingdao	4,193	5,105	4,873	4,861	21.7%	16.2%	15.9%
Shanghai	7,377	8,253	8,173	9,337	11.9%	10.8%	26.6%
Shenyang	3,337	3,536	4,738	3,768	6.0%	42.0%	12.9%
Shenzhen	9,273	13,370	11,548	11,671	44.2%	24.5%	25.9%
Shijiazhuang	2,101	2,378	2,575	2,238	13.2%	22.5%	6.5%
Taiyuan	3,307	3,561	3,165	3,856	7.7%	-4.3%	16.6%
Tianjin	4,872	5,576	5,343	5,636	14.4%	9.7%	15.7%
Urumqi	2,118	2,528	2,737	2,326	19.4%	29.2%	9.8%
Wuhan	3,705	4,516	4,071	4,160	21.9%	9.9%	12.3%
Xiamen	6,918	8,907	6,587	8,771	28.8%	-4.8%	26.8%
Xian	3,221	3,215	3,328	3,715	-0.2%	3.4%	15.4%
Xining	2,033	2,313	2,232	2,288	13.8%	9.8%	12.5%
Yinchuan	2,290	2,230	2,526	2,509	-2.6%	10.3%	9.6%
Zhengzhou	2,820	3,328	3,590	3,222	18.0%	27.3%	14.3%
			Growth Correlation (2007A, 2007P)			0.20	0.52

Source: Actual figures provided by realestate.cei.gov.cn

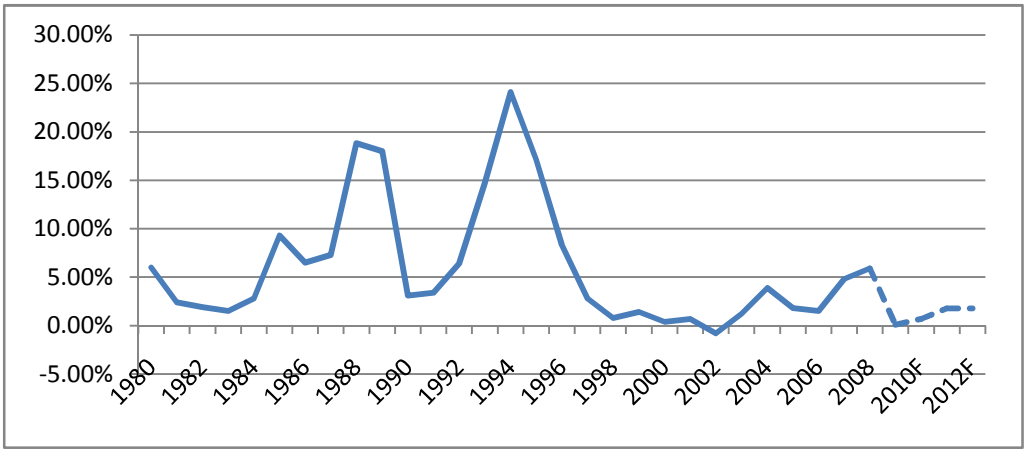
AVERAGE SALES PRICE FORECAST

After we have decided to apply Regression (E)'s model for Average Sales Price forecasting, we then moved on to forecast the independent variables, GDP per Capita Growth, Population Growth, Prime Rate, and Shanghai Composite Index, for each of the 5 years up to 2012.

CPI Forecast

CPI assumptions for 2008-2010 are obtained from International Monetary Fund's ("IMF") estimate. CPI assumptions for 2011 and 2012 are derived from a 12-year stabilized period that started from 1999, averaging 1.8% **(Exhibit 3.7)**.

Exhibit 3.7A: Historical and Projected CPI Trend



Source: Actual figures provided by realestate.cei.gov.cn

Exhibit 3.7B: CPI Index Conversion

Year	CPI	1998 Index	2007 Index
1998A	0.8%	100.00	115.79
1999A	1.4%	101.40	114.19
2000A	0.4%	101.81	113.74
2001A	0.7%	102.52	112.95
2002A	-0.8%	101.70	113.86
2003A	1.2%	102.92	112.51
2004A	3.9%	106.93	108.29
2005A	1.8%	108.86	106.37
2006A	1.5%	110.49	104.80
2007A	4.8%	115.79	100.00
2008A	5.9%	122.63	94.43
2009F	0.1%	122.75	94.33
2010F	0.7%	123.61	93.68
2011F	1.8%	125.83	92.02
2012F	1.8%	128.10	90.40

Source: Actual figures provided by realestate.cei.gov.cn

GDP per Capita Growth Forecast

GDP per Capita is a relationship between Real GDP and Population. To forecast GDP for each of the 35 Chinese cities, we have made the assumption that city-level nominal GDP growth shall fluctuate in the same magnitude as the National nominal GDP growth and calculated a ratio based on actual city-level nominal GDP growth and actual National nominal GDP growth in 2007 for each of the 35 cities **(Exhibit 3.8)**.

Exhibit 3.8: 35 Chinese City-to-Nation GDP Growth Ratios

China Overall	2007A				
Real GDP Growth	13.0%				
CPI	4.80%				
Nominal GDP Growth	18.4%				
City	2007A Nominal GDP Gwth	City to Nation Ratio	City	2007A Nominal GDP Gwth	City to Nation Ratio
Beijing	18.8%	1.02	Nanjing	18.4%	1.00
Changchun	20.0%	1.08	Nanning	22.9%	1.24
Changsha	21.8%	1.18	Ningbo	19.5%	1.06
Chengdu	20.9%	1.13	Qingdao	18.1%	0.98
Chongqing	18.3%	0.99	Shanghai	18.4%	1.00
Dalian	21.8%	1.18	Shenyang	29.8%	1.62
Fuzhou	18.7%	1.01	Shenzhen	19.7%	1.07
Guangzhou	17.2%	0.93	Shijiazhuang	14.4%	0.78
Guiyan	15.1%	0.82	Taiyuan	23.8%	1.29
Haikou	12.4%	0.68	Tianjin	15.9%	0.86
Hangzhou	19.2%	1.04	Urumqi	25.4%	1.38
Harbin	16.4%	0.89	Wuhan	21.3%	1.16
Hefei	24.3%	1.32	Xiamen	18.8%	1.02
Hohhot	22.3%	1.21	Xian	21.6%	1.17
Jinan	17.2%	0.94	Xining	21.6%	1.17
Kunming	16.8%	0.91	Yinchuan	21.9%	1.19
Lanzhou	14.8%	0.80	Zhengzhou	24.2%	1.32
Nanchang	17.4%	0.94			

Sources: IMF and realestate.cei.gov.cn

Once the ratio for each city is determined, we then made assumptions on the National nominal GDP growth for the next 5 years. Our National nominal GDP growth assumptions for 2008-2010 are derived from IMF's estimate of National Real GDP growth and adjusted for anticipated inflation of 5.9%, 0.1%, and 0.7%, respectively. As for the 2011 and 2012 National nominal GDP growth forecast, we have made the assumption that the National nominal GDP growth shall remain at the same level based on IMF's 2010

National Real GDP growth estimate of 8.5% adjusted for anticipated inflation of 1.8% for each of the two years **(Exhibit 3.9)**.

Exhibit 3.9: National GDP Growth Forecast

China	2007A	2008A	2009F	2010F	2011F	2012F
Real GDP Growth	13.0%	9.0%	7.5%	8.5%	8.5%	8.5%
CPI	4.80%	5.90%	0.10%	0.70%	1.80%	1.80%
Nominal GDP Growth	18.4%	15.4%	7.6%	9.3%	10.5%	10.5%

Source: IMF's actuals and forecasts on Real GDP Growth and CPI (2007-2010)

Once the National GDP growth predictions are established, we then calculated the city-level GDP growth for each of the 35 cities based on the city-to-National GDP growth ratio **(Exhibit 3.10)** (Please refer to **Appendix B** for complete historical and forecasted nominal GDP growth).

Exhibit 3.10: 35 Chinese Cities Nominal GDP Growth 5-Year Forecast

City	2007A	2008F	2009F	2010F	2011F	2012F
Beijing	18.8%	15.8%	7.8%	9.5%	10.7%	10.7%
Changchun	20.0%	16.7%	8.2%	10.0%	11.3%	11.3%
Changsha	21.8%	18.2%	9.0%	10.9%	12.3%	12.3%
Chengdu	20.9%	17.5%	8.6%	10.5%	11.8%	11.8%
Chongqing	18.3%	15.3%	7.5%	9.2%	10.4%	10.4%
Dalian	21.8%	18.3%	9.0%	11.0%	12.4%	12.4%
Fuzhou	18.7%	15.6%	7.7%	9.4%	10.6%	10.6%
Guangzhou	17.2%	14.4%	7.1%	8.6%	9.7%	9.7%
Guiyan	15.1%	12.6%	6.2%	7.6%	8.5%	8.5%
Haikou	12.4%	10.4%	5.1%	6.3%	7.1%	7.1%
Hangzhou	19.2%	16.0%	7.9%	9.6%	10.9%	10.9%
Harbin	16.4%	13.7%	6.8%	8.2%	9.3%	9.3%
Hefei	24.3%	20.3%	10.0%	12.2%	13.8%	13.8%
Hohhot	22.3%	18.7%	9.2%	11.2%	12.7%	12.7%
Jinan	17.2%	14.4%	7.1%	8.7%	9.8%	9.8%
Kunming	16.8%	14.1%	6.9%	8.4%	9.5%	9.5%
Lanzhou	14.8%	12.4%	6.1%	7.4%	8.4%	8.4%
Nanchang	17.4%	14.6%	7.2%	8.7%	9.9%	9.9%
Nanjing	18.4%	15.4%	7.6%	9.2%	10.4%	10.4%
Nanning	22.9%	19.1%	9.4%	11.5%	13.0%	13.0%
Ningbo	19.5%	16.3%	8.1%	9.8%	11.1%	11.1%
Qingdao	18.1%	15.1%	7.5%	9.1%	10.3%	10.3%
Shanghai	18.4%	15.4%	7.6%	9.2%	10.4%	10.4%
Shenyang	29.8%	24.9%	12.3%	15.0%	16.9%	16.9%
Shenzhen	19.7%	16.5%	8.1%	9.9%	11.2%	11.2%
Shijiazhuang	14.4%	12.0%	5.9%	7.2%	8.2%	8.2%
Taiyuan	23.8%	20.0%	9.8%	12.0%	13.5%	13.5%
Tianjin	15.9%	13.3%	6.5%	8.0%	9.0%	9.0%
Urumqi	25.4%	21.2%	10.5%	12.7%	14.4%	14.4%
Wuhan	21.3%	17.8%	8.8%	10.7%	12.1%	12.1%
Xiamen	18.8%	15.8%	7.8%	9.5%	10.7%	10.7%
Xian	21.6%	18.1%	8.9%	10.9%	12.3%	12.3%
Xining	21.6%	18.1%	8.9%	10.9%	12.3%	12.3%
Yinchuan	21.9%	18.3%	9.0%	11.0%	12.4%	12.4%
Zhengzhou	24.2%	20.3%	10.0%	12.2%	13.8%	13.8%

From the city-level GDP growth, we could then predict the GDPs for all cities for the 5 years up to 2012 and derive a GDP per Capita for each city after dividing Population (Please refer to "Population Growth Forecast" under this section for Population assumption), and ultimately the GDP per Capita **(Exhibit 3.11)** (Please refer to **Appendix C** for complete historical and forecasted GDP per Capita and **Appendix D** for historical and forecasted GDP per Capita Growth).

Exhibit 3.11: 35 Chinese Cities Real GDP per Registered Capita 5-Year Forecast by 2012F Ranking (RMB)

	City	2007A	2008F	2009F	2010F	2011F	2012F
1	Shenzhen*	320,255	326,441	326,801	330,513	334,486	338,507
2	Shanghai	88,398	95,651	102,092	109,977	118,467	127,613
3	Guangzhou	91,912	97,529	102,513	108,649	115,073	121,876
4	Beijing	77,092	83,197	88,423	94,882	101,835	109,298
5	Xiamen	82,986	87,311	90,474	94,654	99,047	103,644
6	Ningbo	60,844	66,392	71,187	77,102	83,556	90,551
7	Hangzhou	60,983	66,152	70,595	76,080	82,023	88,430
8	Shenyang	45,383	53,165	59,226	67,143	76,558	87,294
9	Dalian	54,146	59,955	64,729	70,714	77,391	84,699
10	Hohhot	49,861	55,035	59,130	64,309	70,087	76,383
11	Nanjing	53,206	57,000	60,232	64,238	68,508	73,062
12	Tianjin	52,658	55,826	58,893	62,582	66,409	70,470
13	Qingdao	49,955	53,738	57,078	61,174	65,552	70,243
14	Jinan	42,371	45,496	48,375	51,868	55,577	59,552
15	Wuhan	37,936	41,681	44,729	48,551	52,781	57,380
16	Zhengzhou	35,173	39,198	42,260	46,184	50,627	55,497
17	Taiyuan	35,320	39,248	42,246	46,083	50,410	55,144
18	Changsha	34,364	37,941	40,855	44,513	48,584	53,027
19	Chengdu	29,886	32,799	35,211	38,222	41,544	45,154
20	Hefei	27,868	31,173	33,730	36,996	40,703	44,782
21	Fuzhou	31,328	33,837	36,014	38,696	41,582	44,684
22	Changchun	28,006	30,593	32,785	35,504	38,479	41,704
23	Urumqi	35,464	36,980	37,171	37,904	38,792	39,701
24	Nanchang	28,289	30,101	31,700	33,667	35,737	37,935
25	Kunming	27,140	28,981	30,695	32,771	34,956	37,287
26	Yinchuan	27,462	29,424	30,736	32,489	34,404	36,433
27	Xian	23,078	25,365	27,200	29,510	32,072	34,855
28	Harbin	24,681	26,303	27,844	29,703	31,649	33,724
29	Shijiazhuang	24,718	25,807	26,952	28,320	29,691	31,129
30	Haikou	25,741	26,293	27,054	27,964	28,809	29,680
31	Lanzhou	22,950	23,975	25,018	26,274	27,539	28,864
32	Guiyan	19,280	20,233	21,187	22,335	23,502	24,730
33	Nanning	15,640	17,335	18,671	20,364	22,262	24,338
34	Chongqing*	12,742	13,748	14,639	15,729	16,900	18,157
35	Xining	15,902	16,243	16,188	16,324	16,488	16,653

**Shenzhen's Registered-to-Total Population ratio is particularly low, overestimating Real GDP per Capita; Chongqing behaves more like a province rather than a city amid its much larger geographical area, underestimating Real GDP per Capita*

Population Growth Forecast

Population growths are typically not as volatile as other independent variables, thus our assumptions can be made relatively accurately based on historical trend. In particular, our Population forecast is based on an average between the 2007 year-on-year growth and an 8-year stabilized Compound Annual Growth Rate ("CAGR") that started in year 2000. We believe this average can more accurately reflect Population Growth for the next 5 years,

as the average takes into consideration the most recent growth rate and the rate during a stabilized period, minimizing the risks of over-estimating or under-estimating if we were to rely on just one growth rate taken from recent years where exponential growth cannot be sustained in the medium-to-long term or miss out on a new steep growth trend **(Exhibit 3.12)** (Please refer to **Appendix E** for complete historical and forecasted Population and **Appendix F** for historical and forecasted Population Growth).

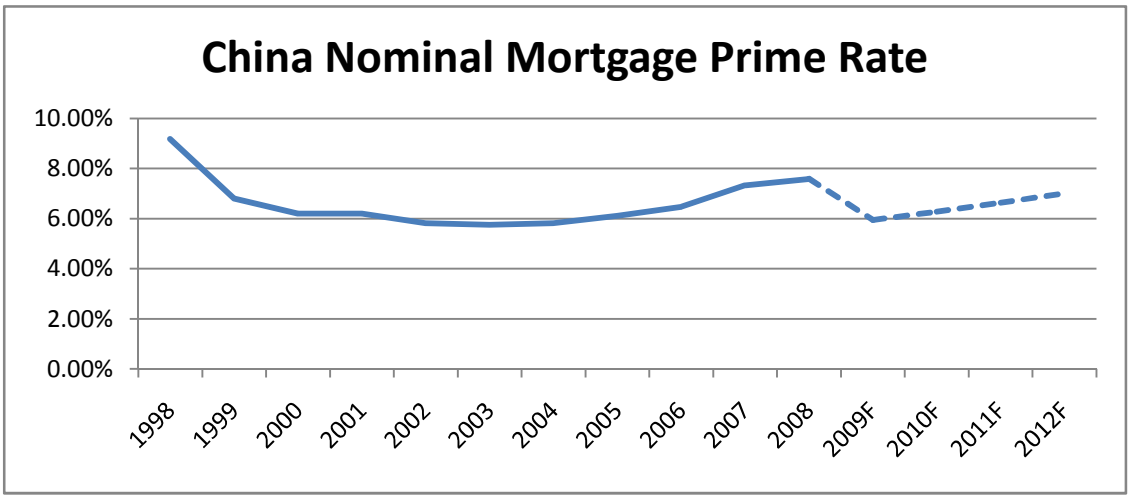
Exhibit 3.12: 35 Chinese Cities Registered Population Forecast (in Mil) - 2012F Ranking

	City	Stablized 8-Yr CAGR	2007 1-Yr Growth	Average Growth Forecast	2007A	2008F	2009F	2010F	2011F	2012F
1	Chongqing	0.7%	1.1%	0.9%	32.4	32.6	32.9	33.2	33.5	33.8
2	Shanghai	0.6%	0.8%	0.7%	13.8	13.9	14.0	14.1	14.2	14.3
3	Beijing	1.3%	1.3%	1.3%	12.1	12.3	12.5	12.6	12.8	12.9
4	Chengdu	1.3%	0.8%	1.1%	11.1	11.2	11.4	11.5	11.6	11.7
5	Harbin	0.8%	0.7%	0.7%	9.9	9.9	10.0	10.1	10.2	10.2
6	Shijiazhuang	1.0%	1.7%	1.3%	9.6	9.7	9.8	9.9	10.1	10.2
7	Tianjin	0.7%	1.1%	0.9%	9.6	9.7	9.8	9.9	9.9	10.0
8	Wuhan	1.4%	1.1%	1.3%	8.3	8.4	8.5	8.6	8.7	8.8
9	Guangzhou	1.4%	2.1%	1.8%	7.7	7.9	8.0	8.2	8.3	8.4
10	Xian	1.5%	1.5%	1.5%	7.6	7.8	7.9	8.0	8.1	8.2
11	Qingdao	1.0%	1.1%	1.1%	7.6	7.7	7.7	7.8	7.9	8.0
12	Changchun	0.9%	0.9%	0.9%	7.5	7.5	7.6	7.7	7.7	7.8
13	Zhengzhou	1.7%	2.2%	1.9%	7.1	7.2	7.3	7.5	7.6	7.8
14	Nanning	1.3%	1.7%	1.5%	6.8	6.9	7.0	7.1	7.3	7.4
15	Shenyang	0.5%	0.9%	0.7%	7.1	7.1	7.2	7.2	7.3	7.3
16	Hangzhou	1.1%	0.9%	1.0%	6.7	6.8	6.9	6.9	7.0	7.1
17	Changsha	1.2%	1.0%	1.1%	6.4	6.4	6.5	6.6	6.7	6.7
18	Nanjing	1.8%	1.6%	1.7%	6.2	6.3	6.4	6.5	6.6	6.7
19	Fuzhou	1.0%	1.2%	1.1%	6.3	6.4	6.4	6.5	6.6	6.7
20	Jinan	1.0%	0.2%	0.6%	6.0	6.1	6.1	6.2	6.2	6.2
21	Dalian	0.7%	1.1%	0.9%	5.8	5.8	5.9	5.9	6.0	6.0
22	Ningbo	0.6%	0.7%	0.7%	5.6	5.7	5.7	5.8	5.8	5.8
23	Kunming	1.1%	0.7%	0.9%	5.2	5.2	5.3	5.3	5.4	5.4
24	Nanchang	1.8%	1.5%	1.7%	4.9	5.0	5.1	5.2	5.3	5.3
25	Hefei	1.3%	1.9%	1.6%	4.8	4.9	4.9	5.0	5.1	5.2
26	Taiyuan	2.0%	1.9%	1.9%	3.6	3.6	3.7	3.8	3.8	3.9
27	Guiyan	1.2%	1.5%	1.3%	3.6	3.6	3.7	3.7	3.8	3.8
28	Urumqi	5.0%	14.6%	9.8%	2.3	2.5	2.8	3.1	3.4	3.7
29	Lanzhou	1.4%	1.8%	1.6%	3.2	3.2	3.3	3.3	3.4	3.5
30	Xining	3.1%	15.3%	9.2%	2.2	2.4	2.6	2.8	3.1	3.3
31	Shenzhen	7.9%	7.9%	7.9%	2.1	2.3	2.5	2.7	2.9	3.1
32	Hohhot	0.8%	2.3%	1.6%	2.2	2.2	2.3	2.3	2.3	2.4
33	Xiamen	3.5%	4.3%	3.9%	1.7	1.7	1.8	1.9	1.9	2.0
34	Yinchuan	5.7%	2.8%	4.3%	1.5	1.6	1.6	1.7	1.8	1.8
35	Haikou	2.8%	1.4%	2.1%	1.5	1.6	1.6	1.6	1.7	1.7

Prime Rate Forecast

Our future Prime Rates are estimated based on comparison to historical trend. We have made the assumption that 2009F will be the bottom of current financial crisis in China with a moderate recovery in the next few years to 2012. As such, we have selected 2003, the most recent year with the lowest prime rate in China, as inference to 2009F and calculated a trough-to-peak 6-Year CAGR of 5.67% to determine the growth of prime rate up to 2012 adjusted for inflation **(Exhibit 3.13)**.

Exhibit 3.13A: China Nominal Mortgage Prime Rate Historical and Forecast



Source: Nominal Mortgage Prime Rate provided by People's Bank of China

Exhibit 3.13B: China Real Mortgage Prime Rate Historical and Forecast

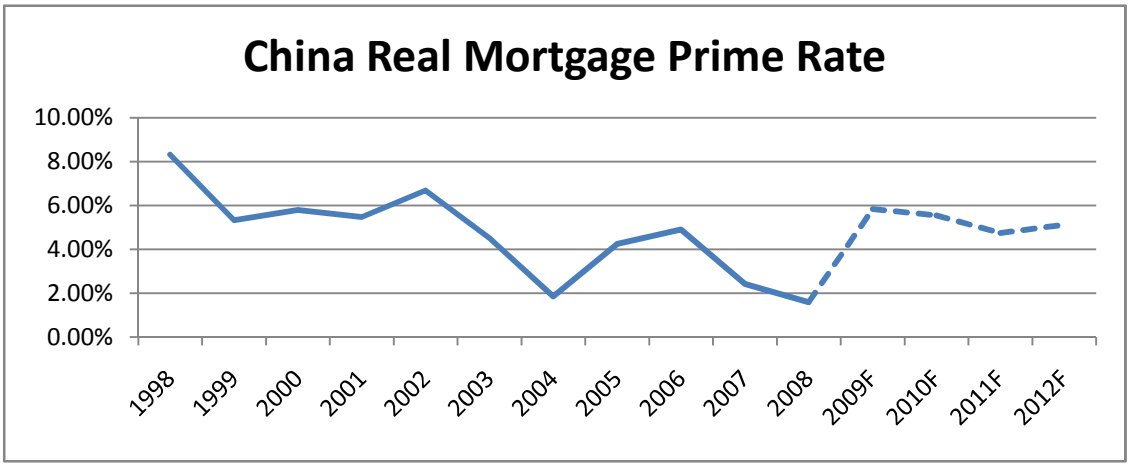


Exhibit 3.13C: China Real Mortgage Prime Rate Forecast

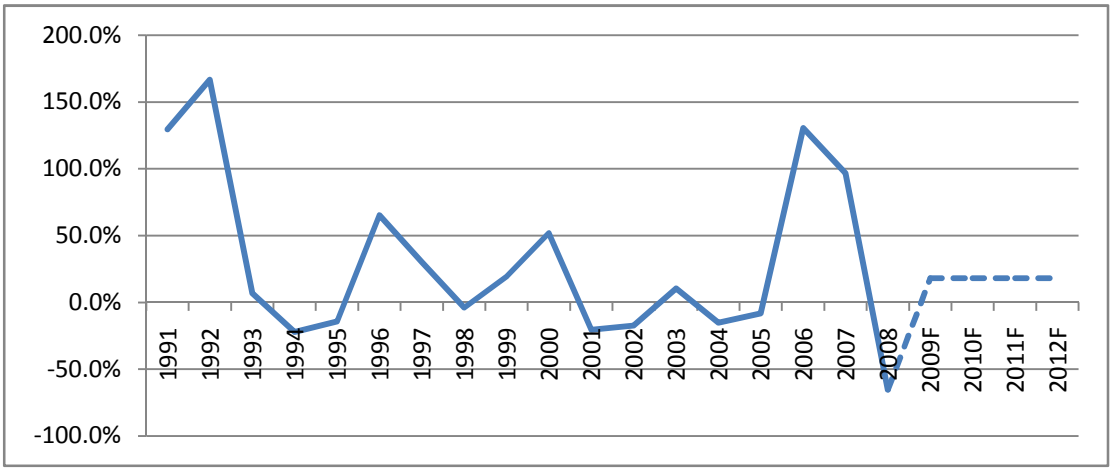
Year	Nominal Prime Rate	CPI	Real Prime Rate	Year	Nominal Prime Rate	CPI	Real Prime Rate
1998	9.18%	0.80%	8.31%	2006	6.47%	1.50%	4.90%
1999	6.80%	1.40%	5.33%	2007	7.34%	4.80%	2.42%
2000	6.21%	0.40%	5.79%	2008	7.59%	5.90%	1.59%
2001	6.21%	0.70%	5.47%	2009F	5.94%	0.10%	5.83%
2002	5.82%	-0.80%	6.68%	2010F	6.28%	0.70%	5.54%
2003	5.76%	1.20%	4.51%	2011F	6.63%	1.80%	4.75%
2004	5.82%	3.90%	1.85%	2012F	7.01%	1.80%	5.12%
2005	6.12%	1.80%	4.24%				
Nominal Prime Rate CAGR (2003-2008): 5.67%							

Source: Nominal Prime Rate provided by People's Bank of China

Shanghai Composite Index Forecast

Our Shanghai Composite Index 5-Year estimate is derived from calculating a historically stabilized 10-Year average of 18.1% during 1999-2008, in line with our data series period for all independent variables applied in the regression models, and adjusted for CPI. We chose not to use an 18-Year average that started in 1991 as the figure is quite high at 29.9% and does not appear to be sustainable in future years **(Exhibit 3.14)**.

Exhibit 3.14A: Shanghai Composite Index Historical and Forecast



Source: Shanghai Stock Exchange

Exhibit 3.14B: Shanghai Composite Index Year-End Real Return Calculation

Year	Year-End Nominal Return	Year-End Closing	CPI	Year-End Real Return	Year	Year-End Nominal Return	Year-End Closing	CPI	Year-End Real Return
1991	129.4%	293	3.4%	121.9%	2002	-17.5%	1,358	-0.8%	-16.9%
1992	166.6%	780	6.4%	150.5%	2003	10.3%	1,497	1.2%	9.0%
1993	6.8%	834	14.7%	-6.8%	2004	-15.4%	1,267	3.9%	-18.6%
1994	-22.3%	648	24.1%	-37.4%	2005	-8.3%	1,161	1.8%	-9.9%
1995	-14.3%	555	17.1%	-26.8%	2006	130.4%	2,675	1.5%	127.0%
1996	65.1%	917	8.3%	52.5%	2007	96.7%	5,262	4.8%	87.7%
1997	30.2%	1,194	2.8%	26.7%	2008	-65.4%	1,821	5.9%	-67.3%
1998	-4.0%	1,147	0.8%	-4.7%	2009F	18.1%	2,150	0.1%	18.0%
1999	19.2%	1,367	1.4%	17.5%	2010F	18.1%	2,540	0.7%	17.3%
2000	51.7%	2,073	0.4%	51.1%	2011F	18.1%	2,999	1.8%	16.0%
2001	-20.6%	1,646	0.7%	-21.2%	2012F	18.1%	3,542	1.8%	16.0%
Year-End Nominal Return 10-Yr Average (1999-2008): 18.1%									

Source: Shanghai Stock Exchange

CAPITAL APPRECIATION POTENTIALS OF 35 CHINESE CITIES

The historical and 5-Year forecast of Average Sales Price based on the model derived from Regression (E) is shown in **Exhibit 3.15** (Please refer to **Appendix G** for historical nominal average sales price).

Exhibit 3.15: 35 Chinese Cities Average Sales Price Historical and 5-Year Forecast (in RMB psm) - 2012F Ranking

City	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008F	2009F	2010F	2011F	2012F
Xiamen	3227	2849	2890	2955	3462	4080	5046	6918	8907	10,941	12,779	15,025	17,793	21,002
Shenzhen	5714	6000	6220	5997	6518	6914	7442	9273	13370	14,200	14,789	15,561	16,688	17,729
Beijing	5467	5183	5327	5086	5013	5140	6555	7729	10661	11,170	11,480	11,922	12,620	13,232
Ningbo	2070	2026	2105	2684	2859	3277	4805	5350	6097	7,029	7,984	9,091	10,421	11,907
Hangzhou	3066	3109	2964	3640	4114	4206	5802	6253	7432	8,426	9,037	9,765	10,635	11,541
Shanghai	3542	3783	4132	4562	5613	6238	7125	7377	8253	8,815	9,244	9,792	10,568	11,300
Guangzhou	4506	4525	4571	4549	4499	4717	5362	6447	8439	8,728	8,870	9,106	9,528	9,873
Tianjin	2463	2586	2607	2749	2692	3194	4241	4872	5576	6,352	6,884	7,507	8,243	9,020
Dalian	2511	2694	3026	3038	3037	3219	3808	4460	5417	6,225	6,743	7,366	8,114	8,908
Qingdao	1923	1982	2068	2352	2584	2976	3823	4193	5105	5,874	6,410	7,044	7,799	8,605
Fuzhou	2025	2104	2261	2232	2450	2667	3171	4167	4900	5,497	6,073	6,727	7,503	8,340
Wuhan	1966	1861	1971	2182	2276	2667	3176	3705	4516	5,125	5,483	5,915	6,435	6,976
Taiyuan	1487	1555	2231	2162	2480	2526	3088	3307	3561	3,974	4,434	4,952	5,556	6,219
Chengdu	1844	1829	1861	2021	2147	2408	3053	3667	4198	4,722	5,009	5,356	5,776	6,207
Nanchang	1334	1476	1684	1858	2339	2630	2680	3200	3509	3,964	4,412	4,922	5,529	6,190
Nanjing	3207	2955	2911	3165	3249	3355	4095	4475	5011	5,347	5,385	5,466	5,593	5,701
Jinan	1924	2047	2099	2355	2596	3066	3184	3478	3720	4,042	4,323	4,636	5,007	5,389
Xian	1296	1650	2088	2197	2161	2592	2857	3221	3215	3,706	4,028	4,415	4,880	5,375
Zhengzhou	1675	2151	2123	2179	2200	2170	2539	2820	3328	3,643	3,924	4,239	4,611	4,999
Haikou	1928	2254	2198	2333	2238	2399	2690	2801	3403	3,602	3,797	4,009	4,257	4,509
Changsha	1789	2043	1961	1878	2009	1922	2222	2548	3191	3,446	3,662	3,903	4,189	4,481
Shenyang	2783	2899	2942	2961	3097	3088	3220	3337	3536	3,890	3,970	4,100	4,280	4,453
Chongqing	1233	1225	1280	1454	1490	1703	2022	2181	2588	2,977	3,247	3,566	3,946	4,352
Nanning	1807	2110	2299	2453	2440	2688	2540	2783	3273	3,491	3,664	3,856	4,087	4,317
Hefei	1904	1705	1719	1842	2125	2459	2977	3012	3154	3,373	3,548	3,743	3,977	4,211
Lanzhou	1751	1772	1808	1686	1882	2257	2488	2636	2920	3,107	3,296	3,501	3,740	3,985
Changchun	2076	1962	2480	2350	2220	2295	2417	2524	3118	3,301	3,438	3,592	3,779	3,962
Hohhot	1357	1350	1502	1369	1437	1548	1639	2280	2459	2,680	2,920	3,183	3,488	3,811
Kunming	2044	2258	2635	2422	2398	2639	2673	2864	2994	3,148	3,258	3,380	3,532	3,679
Harbin	2036	2312	2402	2456	2456	2399	2536	2623	2943	3,085	3,182	3,291	3,429	3,560
Guiyan	1632	1599	1530	1675	1952	1779	1916	2241	2619	2,780	2,941	3,116	3,320	3,528
Xining	1441	1466	1427	1482	1687	1663	1837	2033	2313	2,464	2,622	2,793	2,991	3,195
Urumqi	1837	1851	2000	2081	2097	1946	2042	2118	2528	2,631	2,739	2,853	2,987	3,119
Yinchuan	1532	1530	1739	2151	1944	2082	2159	2290	2230	2,336	2,446	2,562	2,699	2,835
Shijiazhuang	2189	1917	2154	1771	1766	1661	1814	2101	2378	2,409	2,432	2,459	2,501	2,536

Tier I cities

Tier II cities

Tier III cities

Tier IV cities

Our model has suggested that Xiamen, a Tier II city, has both the highest Average Sales Price and highest average annual Capital Appreciation in the 5-year period to 2012, with Average Sales Price of RMB 21,002psm and a 5-year average annual return of 27.2% in 2012 **(Exhibit 3.16)**. In comparison, Xiamen has the third highest Average Sales Price in 2007 of RMB 8,907psm, after Shenzhen's RMB 13,370psm and Beijing's RMB 10,661psm, and second highest average annual Capital Appreciation during the 1999-2007 period of 22.0%, after Ningbo's 24.3%.

The city with the lowest Average Sales Price and lowest average annual Capital Appreciation in the 5-year period to 2012 is Shijiazhuang, a Tier IV city, with Average Sales Price of RMB 2,536psm and a 5-year average annual return of only 1.3% in 2012. In comparison, Shijiazhuang has the third lowest Average Sales Price in 2007 of RMB 2,378psm, after Yinchuan's RMB 2,230psm and Xining's RMB 2,313, and the lowest average annual Capital Appreciation during the 1999-2007 period of 1.1%.

Exhibit 3.16A: 35 Chinese Cities Average Annual Capital Appreciation

City	Average Annual Capital Appreciation					
	8-Yr to 2007	1-Yr to 2008F	2-Yr to 2009F	3-Yr to 2010F	4-Yr to 2011F	5-Yr to 2012F
Xiamen	22.0%	22.8%	21.7%	22.9%	24.9%	27.2%
Ningbo	24.3%	15.3%	15.5%	16.4%	17.7%	19.1%
Nanchang	20.4%	13.0%	12.9%	13.4%	14.4%	15.3%
Taiyuan	17.4%	11.6%	12.3%	13.0%	14.0%	14.9%
Fuzhou	17.8%	12.2%	12.0%	12.4%	13.3%	14.0%
Qingdao	20.7%	15.1%	12.8%	12.7%	13.2%	13.7%
Chongqing	13.7%	15.0%	12.7%	12.6%	13.1%	13.6%
Xian	18.5%	15.3%	12.6%	12.4%	12.9%	13.4%
Dalian	14.5%	14.9%	12.2%	12.0%	12.4%	12.9%
Tianjin	15.8%	13.9%	11.7%	11.5%	12.0%	12.4%
Hangzhou	17.8%	13.4%	10.8%	10.5%	10.8%	11.1%
Hohhot	10.2%	9.0%	9.4%	9.8%	10.5%	11.0%
Wuhan	16.2%	13.5%	10.7%	10.3%	10.6%	10.9%
Zhengzhou	12.3%	9.5%	9.0%	9.1%	9.6%	10.0%
Chengdu	16.0%	12.5%	9.7%	9.2%	9.4%	9.6%
Jinan	11.7%	8.7%	8.1%	8.2%	8.7%	9.0%
Changsha	9.8%	8.0%	7.4%	7.4%	7.8%	8.1%
Xining	7.6%	6.5%	6.7%	6.9%	7.3%	7.6%
Shanghai	16.6%	6.8%	6.0%	6.2%	7.0%	7.4%
Lanzhou	8.3%	6.4%	6.4%	6.6%	7.0%	7.3%
Guiyan	7.6%	6.1%	6.2%	6.3%	6.7%	6.9%
Hefei	8.2%	6.9%	6.2%	6.2%	6.5%	6.7%
Shenzhen	16.7%	6.2%	5.3%	5.5%	6.2%	6.5%
Haikou	9.6%	5.8%	5.8%	5.9%	6.3%	6.5%
Nanning	10.1%	6.7%	6.0%	5.9%	6.2%	6.4%
Yinchuan	5.7%	4.8%	4.8%	5.0%	5.3%	5.4%
Changchun	6.3%	5.9%	5.1%	5.1%	5.3%	5.4%
Shenyang	3.4%	10.0%	6.1%	5.3%	5.3%	5.2%
Beijing	11.9%	4.8%	3.8%	3.9%	4.6%	4.8%
Urumqi	4.7%	4.1%	4.2%	4.3%	4.5%	4.7%
Kunming	5.8%	5.2%	4.4%	4.3%	4.5%	4.6%
Harbin	5.6%	4.8%	4.1%	3.9%	4.1%	4.2%
Guangzhou	10.9%	3.4%	2.6%	2.6%	3.2%	3.4%
Nanjing	7.0%	6.7%	3.7%	3.0%	2.9%	2.8%
Shijiazhuang	1.1%	1.3%	1.1%	1.1%	1.3%	1.3%

Tier I cities Tier II cities Tier III cities Tier IV cities

Exhibit 3.16B: 35 Chinese Cities Accumulated Capital Appreciation

City	1-Yr Price Growth to 2008F	2-Yr Price Growth to 2009F	3-Yr Price Growth to 2010F	4-Yr Price Growth to 2011F	5-Yr Price Growth to 2012F
Xiamen	22.8%	43.5%	68.7%	99.8%	135.8%
Ningbo	15.3%	30.9%	49.1%	70.9%	95.3%
Nanchang	13.0%	25.7%	40.3%	57.6%	76.4%
Taiyuan	11.6%	24.5%	39.1%	56.0%	74.6%
Fuzhou	12.2%	23.9%	37.3%	53.1%	70.2%
Qingdao	15.1%	25.6%	38.0%	52.8%	68.6%
Chongqing	15.0%	25.5%	37.8%	52.5%	68.2%
Xian	15.3%	25.3%	37.3%	51.8%	67.2%
Dalian	14.9%	24.5%	36.0%	49.8%	64.4%
Tianjin	13.9%	23.5%	34.6%	47.8%	61.8%
Hangzhou	13.4%	21.6%	31.4%	43.1%	55.3%
Hohhot	9.0%	18.7%	29.4%	41.8%	55.0%
Wuhan	13.5%	21.4%	31.0%	42.5%	54.5%
Zhengzhou	9.5%	17.9%	27.4%	38.5%	50.2%
Chengdu	12.5%	19.3%	27.6%	37.6%	47.9%
Jinan	8.7%	16.2%	24.6%	34.6%	44.9%
Changsha	8.0%	14.8%	22.3%	31.3%	40.4%
Xining	6.5%	13.4%	20.8%	29.3%	38.1%
Shanghai	6.8%	12.0%	18.6%	28.1%	36.9%
Lanzhou	6.4%	12.9%	19.9%	28.1%	36.5%
Guiyan	6.1%	12.3%	19.0%	26.8%	34.7%
Hefei	6.9%	12.5%	18.7%	26.1%	33.5%
Shenzhen	6.2%	10.6%	16.4%	24.8%	32.6%
Haikou	5.8%	11.6%	17.8%	25.1%	32.5%
Nanning	6.7%	11.9%	17.8%	24.9%	31.9%
Yinchuan	4.8%	9.7%	14.9%	21.0%	27.1%
Changchun	5.9%	10.3%	15.2%	21.2%	27.1%
Shenyang	10.0%	12.3%	15.9%	21.0%	25.9%
Beijing	4.8%	7.7%	11.8%	18.4%	24.1%
Urumqi	4.1%	8.3%	12.8%	18.2%	23.4%
Kunming	5.2%	8.8%	12.9%	18.0%	22.9%
Harbin	4.8%	8.1%	11.8%	16.5%	21.0%
Guangzhou	3.4%	5.1%	7.9%	12.9%	17.0%
Nanjing	6.7%	7.5%	9.1%	11.6%	13.8%
Shijiazhuang	1.3%	2.3%	3.4%	5.2%	6.7%

Tier I cities Tier II cities Tier III cities Tier IV cities

It is interesting to note that the top 10 cities with highest Average Sales Price in 2007 are also ranked top 10 cities with highest Average Sales Price throughout our 5 years of forecast period. Whereas, 9 out of the 10 cities with lowest Average Sales Price in 2007 are still included in the 10 cities with lowest Average Sales Price in 2012F **(Exhibit 3.17)**.

Exhibit 3.17: 35 Chinese Cities Average Sales Price Ranking (2007-2012F)

City	2007 Price Rank	2008F Price Rank	2009F Price Rank	2010F Price Rank	2011F Price Rank	2012F Price Rank
Xiamen	3	3	2	2	1	1
Shenzhen	1	1	1	1	2	2
Beijing	2	2	3	3	3	3
Ningbo	7	7	7	7	6	4
Hangzhou	6	6	5	5	4	5
Shanghai	5	4	4	4	5	6
Guangzhou	4	5	6	6	7	7
Tianjin	8	8	8	8	8	8
Dalian	9	9	9	9	9	9
Qingdao	10	10	10	10	10	10
Fuzhou	12	11	11	11	11	11
Wuhan	13	13	12	12	12	12
Taiyuan	16	16	15	15	15	13
Chengdu	14	14	14	14	13	14
Nanchang	18	17	16	16	16	15
Nanjing	11	12	13	13	14	16
Jinan	15	15	17	17	17	17
Xian	22	19	18	18	18	18
Zhengzhou	20	20	20	19	19	19
Haikou	19	21	21	21	21	20
Changsha	23	23	23	22	22	21
Shenyang	17	18	19	20	20	22
Chongqing	30	29	28	26	25	23
Nanning	21	22	22	23	23	24
Hefei	24	24	24	24	24	25
Lanzhou	28	27	26	27	27	26
Changchun	25	25	25	25	26	27
Hohhot	32	31	31	30	29	28
Kunming	26	26	27	28	28	29
Harbin	27	28	29	29	30	30
Guiyan	29	30	30	31	31	31
Xining	34	33	33	33	32	32
Urumqi	31	32	32	32	33	33
Yinchuan	35	35	34	34	34	34
Shijiazhuang	33	34	35	35	35	35

Tier I cities
Tier II cities
Tier III cities
Tier IV cities

Our model appears to suggest historical Average Sales Price growth trends are relatively good indicators of medium-term future growth potentials, in which 7 out of the 10 cities with the greatest Capital Appreciation and 8 out of the 10 cities with the lowest Capital Appreciation during 1999-2007 are also ranked among the 10 cities with the greatest and lowest Capital Appreciation potentials in the 5 years to 2012, respectively **(Exhibit 3.18)**. However, developers and investors should keep a skeptical mind on our hypothesis amid

the models' inability to capture the full cycle of the commercialized Chinese residential market, which is still relatively young in history.

Exhibit 3.18: 35 Chinese Cities Capital Appreciation Potentials Ranking (2007-2012F)

City	1999 to 2007 Capital Apprec	2008 Capital Apprec Poten	2009 Capital Apprec Poten	2010 Capital Apprec Poten	2011 Capital Apprec Poten	2012 Capital Apprec Poten
Xiamen	2	1	1	1	1	1
Ningbo	1	2	2	2	2	2
Nanchang	4	10	3	3	3	3
Taiyuan	8	13	7	4	4	4
Fuzhou	7	12	9	8	5	5
Qingdao	3	4	4	5	6	6
Chongqing	15	5	5	6	7	7
Xian	5	3	6	7	8	8
Dalian	14	6	8	9	9	9
Tianjin	13	7	10	10	10	10
Hangzhou	6	9	11	11	11	11
Hohhot	20	16	14	13	13	12
Wuhan	11	8	12	12	12	13
Zhengzhou	16	15	15	15	14	14
Chengdu	12	11	13	14	15	15
Jinan	18	17	16	16	16	16
Changsha	22	18	17	17	17	17
Xining	26	23	18	18	18	18
Shanghai	10	20	23	22	20	19
Lanzhou	24	24	19	19	19	20
Guiyan	27	26	21	20	21	21
Hefei	25	19	20	21	22	22
Shenzhen	9	25	26	25	25	23
Haikou	23	28	25	24	23	24
Nanning	21	22	24	23	24	25
Yinchuan	31	32	28	28	28	26
Changchun	29	27	27	27	26	27
Shenyang	34	14	22	26	27	28
Beijing	17	31	32	32	29	29
Urumqi	33	33	30	30	30	30
Kunming	30	29	29	29	31	31
Harbin	32	30	31	31	32	32
Guangzhou	19	34	34	34	33	33
Nanjing	28	21	33	33	34	34
Shijiazhuang	35	35	35	35	35	35

Tier I cities
Tier II cities
Tier III cities
Tier IV cities

In terms of the collective performances among the 4 tiers of Chinese cities, our model has suggested that Tier II cities shall have the strongest Capital Appreciation potentials in the 5 years to 2012, with a collective score of 12.9 (2.5 being highest score and

33.0 being lowest score possible), followed by Tier III cities' 17.6; Tier I cities, on the other hand, is predicted to have the worst collective Capital Appreciation potentials with a collective score of 26.0. In comparison to the collective performances among the 4 tiers of cities during the 1999-2007 period, Tier II cities fared best in Capital Appreciation with a collective score of 13.0, followed closely by Tier I cities' 13.8 **(Exhibit 3.19)**.

From the results, we observed that Tier II cities generally have stronger Capital Appreciation potentials during a market up-cycle, followed by Tier III and Tier IV cities, with Tier I cities having the least Capital Appreciation potentials of all tiers. There are two driving factors for this phenomenon: the first factor is the result of Tier I cities' high sensitivity to Prime Rate, in which Prime Rate typically increases during a market up-cycle negatively impacting the Average Sales Prices of Tier I cities; the second factor is Tier II cities' significantly high sensitivity to Population growth, 7 times more sensitive than Tier I cities and 100 times more sensitive than Tier III and Tier IV cities.

The ranking for the highest collective Average Sales Price in 2012F is predicted to remain unchanged when compared to 2007 figures, with Tier I cities having the highest rank with a collective score of 4.5 (2.5 being highest score and 33.0 being lowest score possible), followed by Tier II cities' 12.5, Tier III cities' 20.2, and Tier IV cities'28.0.

Exhibit 3.19: 2007A and 2012F Collective Price and Capital Appreciation Potential Rankings of 4 Tiers of Chinese Cities

Cities Tier	2007A Price Ranking	2012F Price Ranking	8-Yr to 2007A Capital Appreciaion Ranking	5-Yr to 2012F Capital Appreciaion Ranking
Tier I	3.0	4.5	13.8	26.0
Tier II	13.0	12.5	13.0	12.9
Tier III	19.8	20.2	18.6	17.6
Tier IV	28.6	28.0	25.2	21.1

CHAPTER IV

UNDERSTANDING THE DYNAMICS OF RECENT RESIDENTIAL MARKET FLUCTUATION

PURPOSE AND DATA

Due to data limitations, we were able to observe the general market trends of 35 Chinese cities in respect to economic growth only up to 2007 in the previous Chapter. In order to better understand the dynamics of market fluctuations, especially during the recent Chinese residential market downturn in 2008 and 2009, we have conducted regression analyses based on the monthly economic data of 14 Chinese cities.

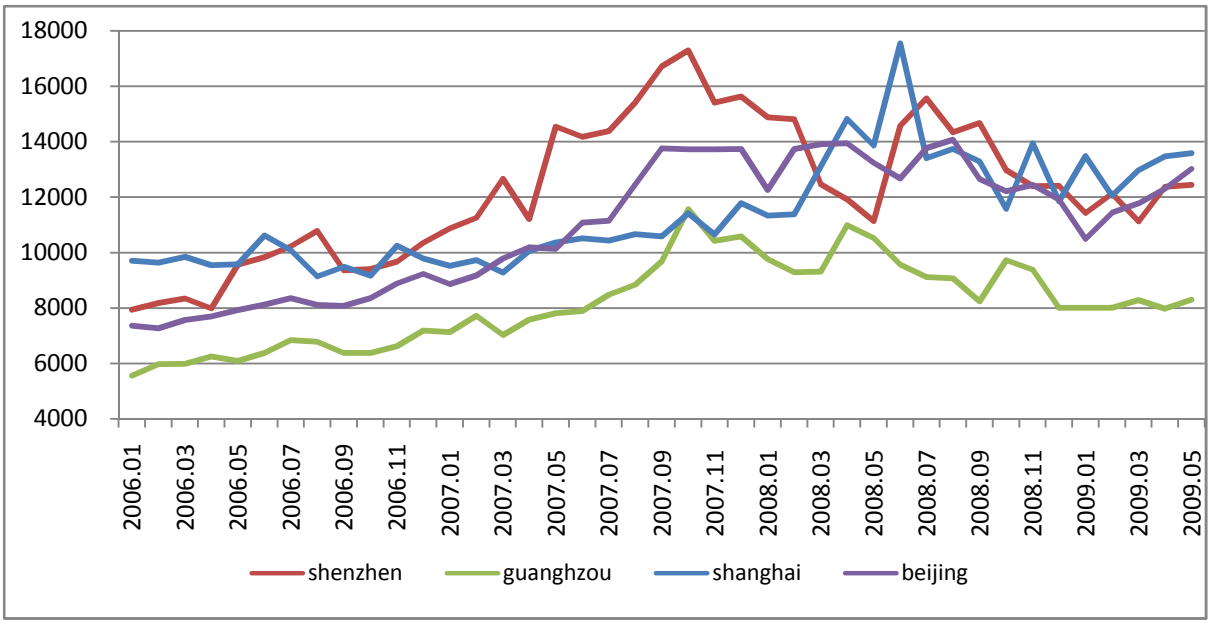
Monthly data is crucial in understanding the dynamics of market fluctuations, as impacts caused by changes in the business environment, fiscal policy and other anti-speculative measures implemented by the PRC government rarely take more than several months to occur, providing investors with perspectives of short-term market movements. The reason for the 14 Chinese cities is because they represent the major residential markets across China, giving us proxy of how the changes in policy and business environment may potentially impact the overall Chinese residential market; more importantly, only those cities produce comparable data that can be applied in our regression analyses.

In particular, we have applied in our regression analyses 41 months of data on average sales price, sales transaction volume, second home mortgage rate, and mortgage prime rate from January 2006 to May 2009 **(Appendix H, I and J)**. We then established a VAR model based on three equations with price, sales, and policy acting as the dependent variable in turn. As we did in the 35-city model, our mortgage prime rate was adjusted to real term.

BACKGROUND

China's residential market has undergone significant fluctuation since 2004, fueled mostly by speculations and policies rather than economic and demographic fundamentals. The most intriguing market performance happened in 2007 and 2008. **Exhibit 4.1** gives a simplified picture of the residential market by presenting the 1-tier cities' price movements. From the beginning of 2007, price appreciation accelerated due to massive speculation, a belief widely held by both the government and citizens. There was no official or generally agreed number regarding the portion of sales attributed to speculations; however, top local real estate agencies estimated that those speculations have contributed to over 30% of sales volume in most speculative cities like Shanghai and Shenzhen.

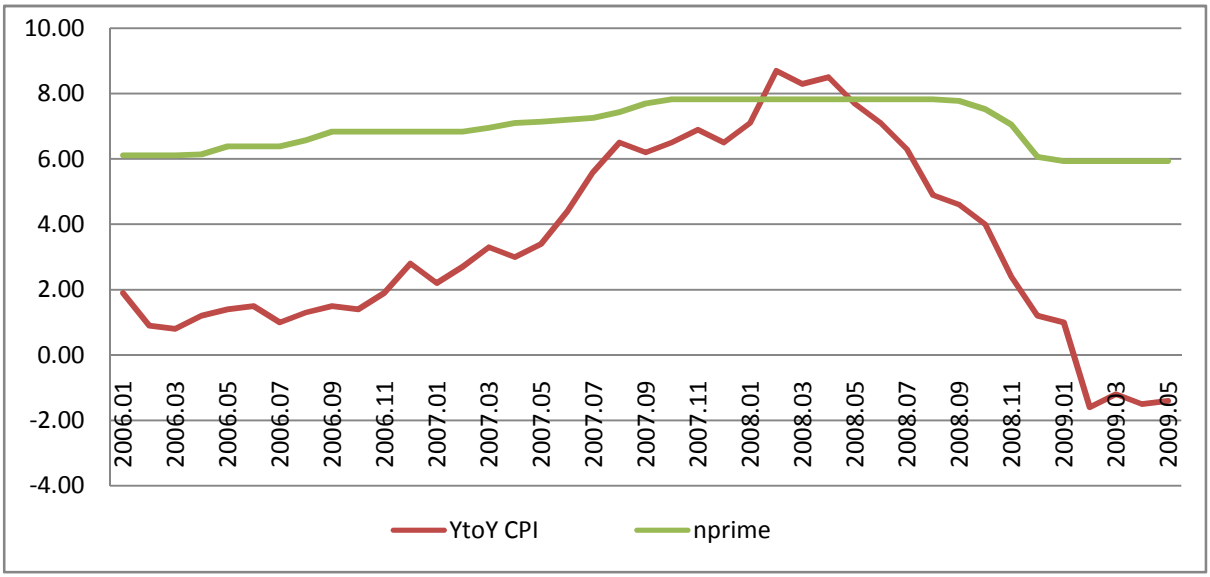
Exhibit 4.1: Tier I Cities' Price Movement from January 2006 To May 2009



Source: Housing Management Bureau

During the same period, the macroeconomic environment also became overheated. Year-on-year inflation in China went from below 2.0% in early 2007 to above 8% in the first quarter of 2008, a dangerous level regarded by the Central government. As a counter measure, a series of interest rate increases is induced by the central bank, starting from the second half of 2006 to the end of 2007 **(Exhibit 4.2)**.

Exhibit 4.2: CPI and Mortgage Prime Rate

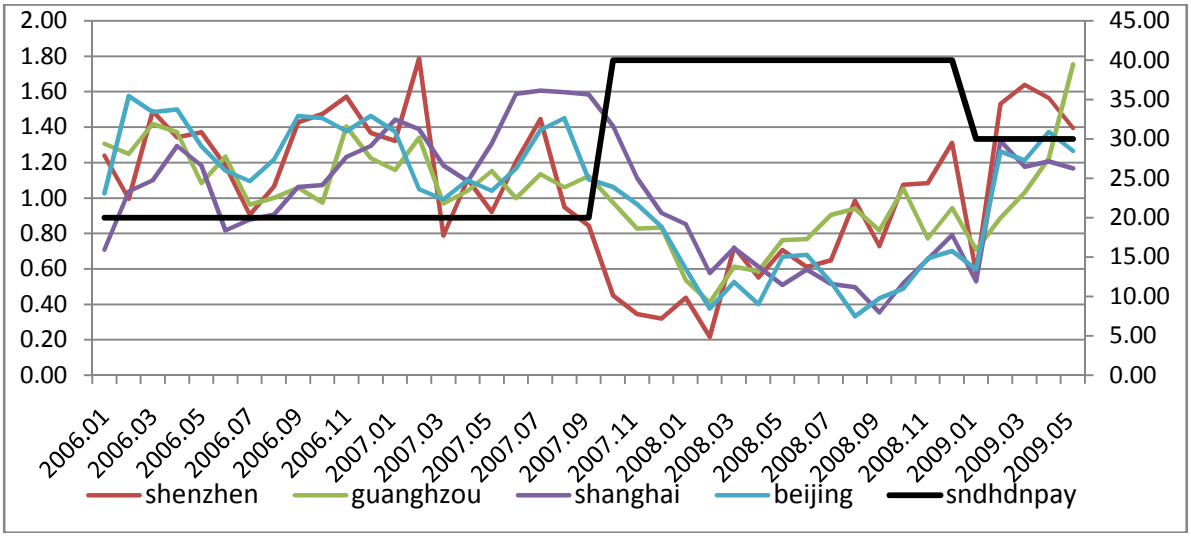


Source: National Bureau of Statistics of China and People's Bank of China

Despite the effort to curb the overheated market, the increased in interest rate did not manage to slowdown the residential market as anticipated. In September 2007, a rigorous policy, generally called "second home mortgage policy," was introduced, which imposed a 10% premium over the prime rate and increased the down payment ratio for the second home purchasers from 20% to 40%. This policy hit the residential market heavily and seemed to successfully drag down residential prices **(Exhibit 4.1)** despite some period lag.

From the second quarter of 2008, inflation declined dramatically, largely due to strict credit control, and sunk into negative territory in early 2009 due to the global financial crisis. The Central government became concern about deflation and a possible recession amid the decline in GDP growth. In late 2008, the Central government attempted to revitalize the economy and real estate market by reducing the nominal prime rate radically and partially lifting the "second home mortgage policy". The sales volume recovered to pre-crisis level **(Exhibit 4.3)** and prices started to recover **(Exhibit 4.1)** when the 10% premium imposed over prime rate was canceled and was replaced by a 30% discount to prime rate instead; whereas, the down payment ratio for second home buyers were reduced to 30%. Some researchers attribute this market recovery to the return of confidence. Their theory suggested that as the long-term fundamentals of China's housing market were unchanged, demand was accumulated in 2008 when people postponed their purchasing plans; therefore, buyers returned to the market quickly when the changes in policy and the significantly lower prices became favorable to the residential market.

Exhibit 4.3: Second Home Mortgage Policy and Sales* in Major Cities



Source: Housing Management Bureau and People's Bank of China

** The sales are adjusted into an index by comparing each month's sale with the average number of the same month of 2006, 2007 and 2008.*

QUESTIONS

What are the drivers of the residential market fluctuation from 2006 to 2009? Are the changes in policy sufficient to affect the direction of the residential price, or do they work collectively with other drivers? How does the prime rate impacts price movement? It is true that the interest rate is manipulated by the central bank, but how about real interest rate after adjustment to CPI? Does macroeconomic condition matters?

Does sales transaction volume impact price movements? Some analysts have regarded sales as the leading indicator of prices (Hongwei Bai, 2009). On the other hand, other theories have suggested that in a rational market rising residential prices actually depress sales transactions involving "a change or choice of tenure" (Wheaton and Lee, 2009), and that in a speculative market dominated by second, or more, home buyers high sales volume decrease the inventory and duration, thus boost prices and subsequently encourage more speculations. Which scenario applies to the reality of China's residential market from 2006 to early 2009?

How did prices and other factors affect sales? Data has suggested that sales appear very sensitive to policy changes **(Exhibit 4.3)**. Sales transaction not only declined significantly almost immediately after the enforcement of the new policy, but also rebounded quickly when the same policy was lifted in the December 2008 while prices remained stagnant.

MODEL, RESULTS AND EXPLANATIONS

In this chapter we want to step further from the panel model by introducing Vector Auto Regression (VAR). This is because we believe that many variables affecting the price cycle are actually interdependent. Exogenous shocks do not necessarily exert its influence directly on prices, but most likely through a complex system. An assumption of VAR is that the evolution of the dependent variable is based on its own lags and the lags of all the other variables in the model. This assumption appears to hold in the Chinese residential market. We will test the robustness of this assumption in this chapter.

A 4-variable panel VAR model is established, as shown in **Exhibit 4.4**.

Exhibit 4.4: Monthly Panel VAR, 2006 - 2009, 14 Cities

$$RPRICE_{i,T} = \alpha_0 + \alpha_1 RPRICE_{i,T-n} + \alpha_2 SALESLEV_{i,T-n} + \alpha_3 SNDHDNPAY_{i,T-n} + \alpha' RPRIME_T + e_{i,T}$$

$$SALELEV_{i,T} = \beta_0 + \beta_1 RPRICE_{i,T-n} + \beta_2 SALESLEV_{i,T-n} + \beta_3 SNDHDNPAY_{i,T-n} + \beta' RPRIME_T + e_{i,T}$$

$$SNDHDNPAY_{i,T} = \gamma_0 + \gamma_1 RPRICE_{i,T-n} + \gamma_2 SALESLEV_{i,T-n} + \gamma_3 SNDHDNPAY_{i,T-n} + \gamma' RPRIME_T + e_{i,T}$$

In our panel model, we shall determine whether lagged sales, the real mortgage prime rate and the second home mortgage policy can explain the movements of real prices and how significantly the influence is, if any. Second, we shall determine the same to sales by simply switching the places of prices and sales in the model. Third, we shall demonstrate qualitatively that the policy is directly caused by the market and used by the PRC government to manipulate the market. All prices and the prime rates were adjusted to real term by CPI, donated as RPRICE and RPRIME, in our analyses. Also sales are seasonally adjusted by comparing each monthly sale with the average number of the same month of 2006, 2007 and 2008, a technique resulting in an index we donated as SALESLEV. As for second home mortgage policy, there are several measures; but since all of those measures are perfectly correlated we just applied second home mortgage down payment (SNDHDNPAY) as a variable.

The first exercise we did was to determine the appropriate lag time to be used in our models. As such, we have tested our models based on a 1-month, 3-month and 6-month lag, respectively. Our results are shown **in Exhibit 4.5, 4.6** and **4.7**.

Exhibit 4.5: 1-Period Lag VAR

Dependent Variable RPRICE

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{1}	0.7846947	0.0285773	27.45864	0
3. SALESLEV{1}	147.1428133	85.7488489	1.71597	0.0867382
4. RPRIME	-39.9669293	14.6793135	-2.72267	0.00668425
5. SNDHDNPAY{1}	4.3779999	4.2680075	1.02577	0.30545694
Centered R**2	0.954235	R Bar **2	0.9528	
Uncentered R**2	0.992501	T x R**2	555.8	

Dependent Variable SALESLEV

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{1}	-0.000004245	0.000011547	-0.36763	0.71328974
3. SALESLEV{1}	0.579829298	0.034648051	16.73483	0
4. RPRIME	0.033050025	0.005931387	5.57206	0.00000004
5. SNDHDNPAY{1}	-0.006172069	0.00172455	-3.57895	0.00037593
Centered R**2	0.511867	R Bar **2	0.496556	
Uncentered R**2	0.936871	T x R**2	524.648	

Dependent Variable SNDHDNPAY

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{1}	0.00067806	0.00012898	5.25711	0.00000021
3. SALESLEV{1}	1.267145322	0.387015149	3.27415	0.00112743
4. RPRIME	-0.426915959	0.066252979	-6.44372	0
5. SNDHDNPAY{1}	0.845927512	0.019263041	43.91454	0
Centered R**2	0.882334	R Bar **2	0.878643	
Uncentered R**2	0.988918	T x R**2	553.794	

Exhibit 4.6: 3-Period Lag VAR

Dependent Variable RPRICE

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{3}	0.5624633	0.0389457	14.44224	0
3. SALESLEV{3}	364.334815	129.0004251	2.82429	0.00492255
4. RPRIME	-88.7399833	19.0558721	-4.65683	0.00000409
5. SNDHDNPAY{3}	6.1926473	5.6094405	1.10397	0.27012322
Centered R**2	0.920526	R Bar **2	0.917898	
Uncentered R**2	0.987068	T x R**2	525.12	

Dependent Variable SALESLEV

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{3}	-0.000027478	0.000013642	-2.0143	0.0444982
3. SALESLEV{3}	0.42455942	0.045185031	9.39602	0
4. RPRIME	0.064083374	0.006674708	9.60093	0
5. SNDHDNPAY{3}	-0.003697277	0.001964821	-1.88174	0.06043652
Centered R**2	0.372295	R Bar **2	0.351534	
Uncentered R**2	0.917012	T x R**2	487.85	

Dependent Variable SNDHDNPAY

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{3}	0.00137261	0.00019174	7.15869	0
3. SALESLEV{3}	3.347823539	0.635104645	5.27129	0.0000002
4. RPRIME	-1.080874742	0.09381731	-11.52106	0
5. SNDHDNPAY{3}	0.666786976	0.027616821	24.14423	0
Centered R**2	0.755067	R Bar **2	0.746966	
Uncentered R**2	0.977522	T x R**2	520.041	

Exhibit 4.7: 6-Period Lag VAR

Dependent Variable RPRICE

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{6}	0.2253784	0.0460708	4.892	0.00000137
3. SALESLEV{6}	235.0579978	196.7041779	1.19498	0.23269406
4. RPRIME	-164.9670535	25.9073416	-6.36758	0
5. SNDHDNPAY{6}	30.2375415	6.5808028	4.59481	0.00000557
Centered R**2	0.905029	R Bar **2	0.901608	
Uncentered R**2	0.984664	T x R**2	482.486	

Dependent Variable SALESLEV

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{6}	-0.000025033	0.000016143	-1.55068	0.12164803
3. SALESLEV{6}	0.231452483	0.06892486	3.35804	0.00084848
4. RPRIME	0.090176436	0.009077895	9.93363	0
5. SNDHDNPAY{6}	-0.007494037	0.002305904	-3.24993	0.00123677
Centered R**2	0.277699	R Bar **2	0.251684	
Uncentered R**2	0.89925	T x R**2	440.633	

Dependent Variable SNDHDNPAY

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0	0	0	0
2. RPRICE{6}	0.001208333	0.000237089	5.09654	0.0000005
3. SALESLEV{6}	1.987494587	1.012274704	1.96339	0.05018703
4. RPRIME	-2.000930214	0.13332379	-15.00805	0
5. SNDHDNPAY{6}	0.58818676	0.033865983	17.36807	0
Centered R**2	0.67178	R Bar **2	0.659959	
Uncentered R**2	0.971459	T x R**2	476.015	

The model based on a 3-month lag has provided the most appropriate relationship among the variables. In the RPRICE equation of the 1-month lag model, the Coefficient and T-statistics of SALESLEV are 147.14 and 1.72, while in the 3-month model they are 364.33 and 2.82. Within the same pair of equations, the RPRIME also gets a bigger Coefficient and T-Statistics in the 3-month lag model. Comparing the SALESLEV equations of the two models, we can see that the T-Statistics of RPRICE in the 3-month lag model is -2.01, whereas the 1-month lag model is -0.37. However, between the two SALESKEV equations, the 1-month lag model actually explained better on the impact of SNDHDNPAY on SALESLEV by having a much stronger Coefficient and T-Statistics. It is also clear that the SNDHDNPAY equation is more appropriate in the 3-month model. The same conclusion will be drawn by comparing the 3-month model and 6-month model.

All three tests have shown consistent relationships among the variables. Just as we have expected, “second home mortgage policy” is indeed an endogenous variable, that is, a political result caused by an overheated market. This policy works successfully in depressing prices by ways of curbing sales transaction volume. Prices were directly and

strongly influenced by the changes in real prime rate, where prices were boosted by the dropping real rate and depressed by its rebound. Prices appreciation was also apparently encouraged by increasing sales; but, on the other hand, the increased prices could discourage sales. The issuance of the "second home mortgage policy" gave another hit on sales. The model has shown that low sales could depress price in approximately 3 months.

One puzzle of this model is that in all three models the RPRIME always has a positive relation with SALESLEV, which is different from theory and our expectation. We have tested a 1-month and 3-month lag on RPRIME to see if the result might be different; but the results have shown that the puzzle still persist by giving a Coefficient of 0.025 and a T-Statistics of 3.81 for the 1-month lag model and a Coefficient of 0.089 and a T-Statistics of 10.24 for a 3-month lag model. One explanation could be found in our model: since the RPRIME is negatively related with RPRICE and RPRICE in turn could reversely drive SALESLEV, a positive relation between RPRIME and SALESLEV could be true. Another explanation comes from the nominal prime rate. In fact the nominal prime rate moves negatively with real prime rate due to a volatile CPI **(Exhibit 4.2)**. Potential home owners are not only concern about inflation but also nominal prime rate when they buy residential, because it largely determines their affordability. So, if it is true that the SALELEV is negatively related with the nominal prime rate, it should have a positive relation with real prime rate. The later explanation is quite unique because in general nominal prime rate does not necessarily negatively correlate with real prime rate.

To illustrate these relations in detail, we have graphed the real prime rate together with the real prices of all 1-tier cities **(Exhibit 4.8)**; and each city's real prices together with its SALESLEV in four different graphs **(Exhibit 4.9)**.

Exhibit 4.8: Real Prime Rate and 1-Tier Cities' Prices

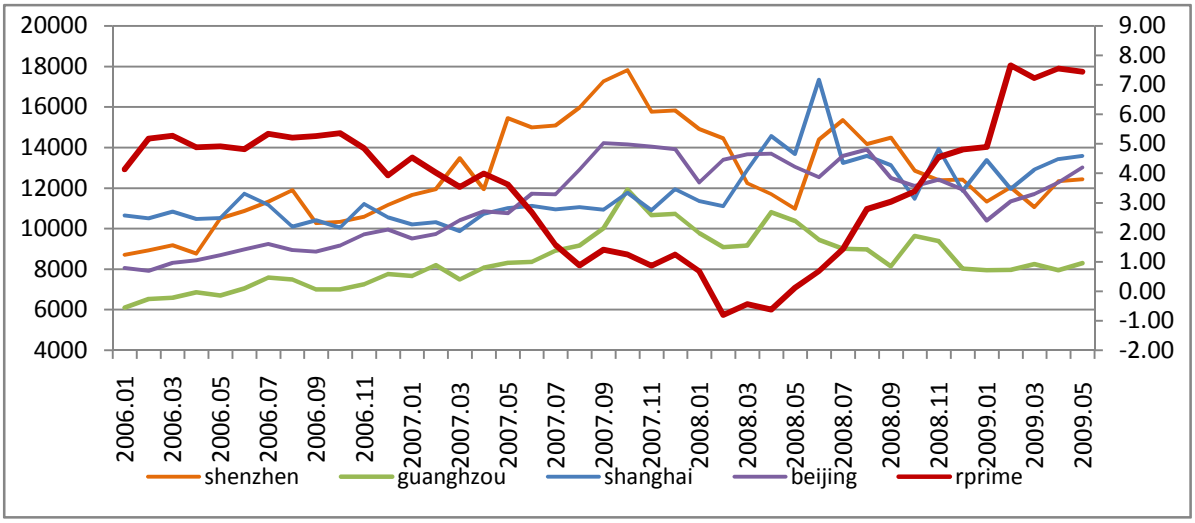
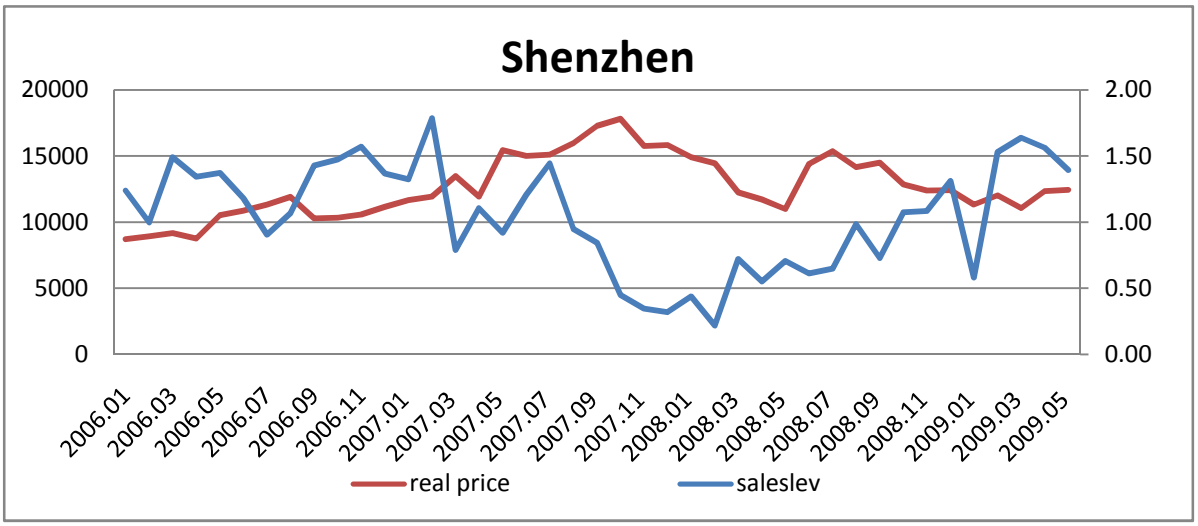
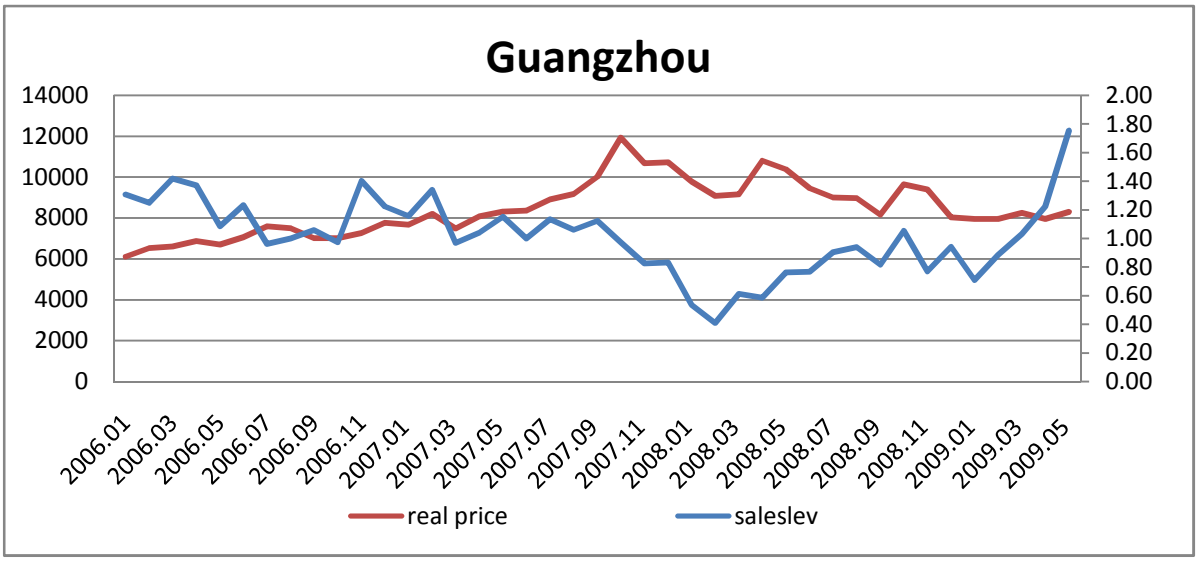
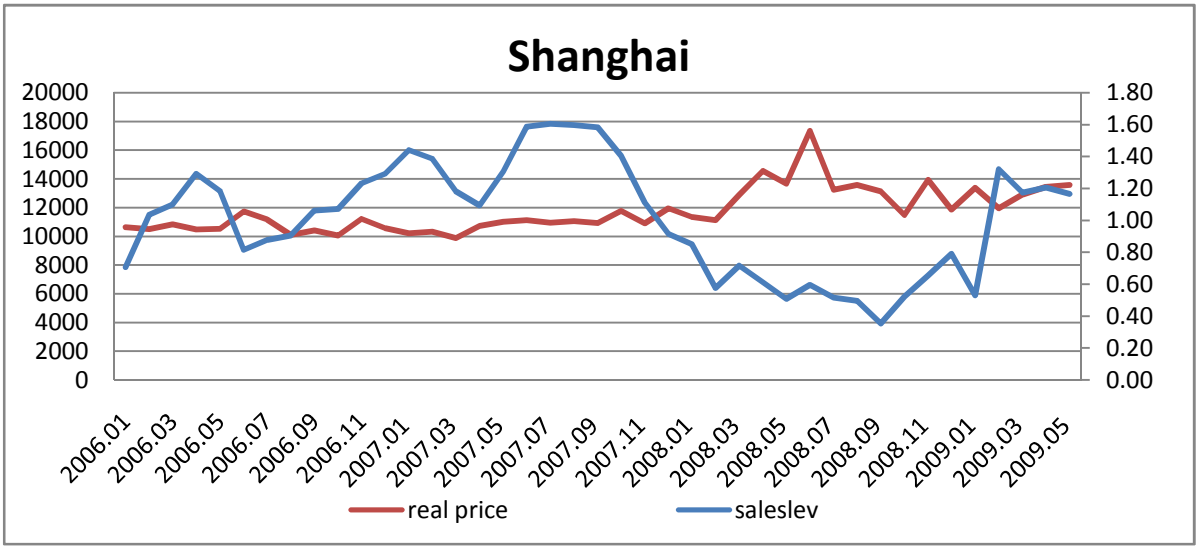
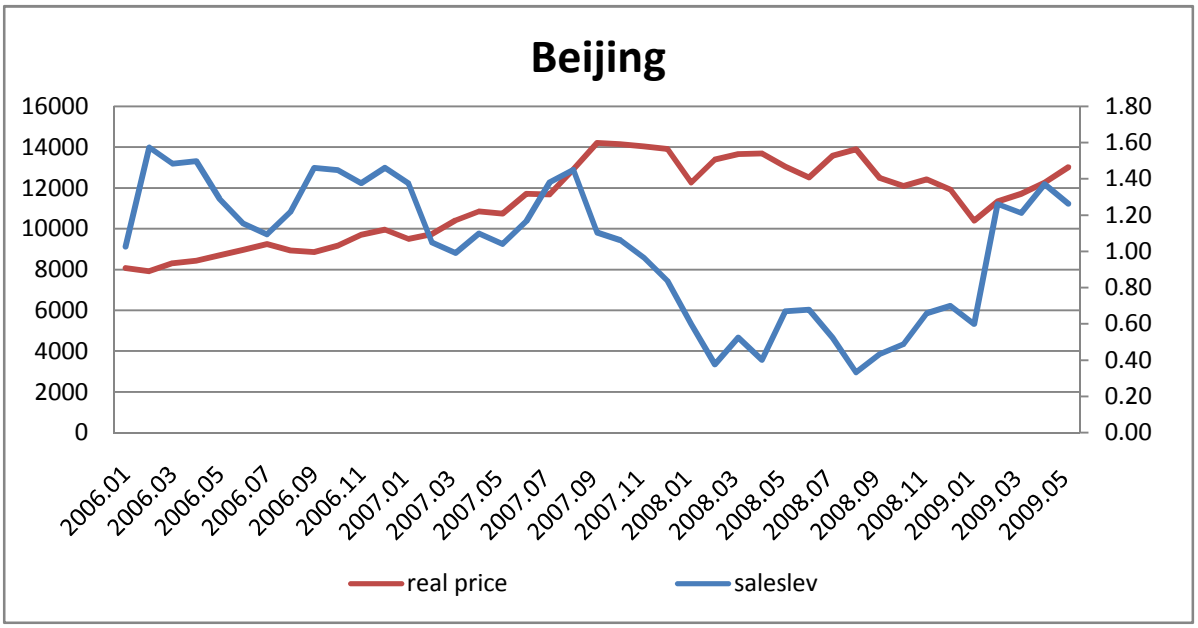


Exhibit 4.9: 1-Tier Cities' Real Prices and SALESLEV









Our analyses have suggested that the real prime rate is one of the most important exogenous variables that have substantial impact on the residential market. According to the definition, the real prime rate is composed by two factors: nominal prime rate, which is totally controlled by the central bank, and CPI, which is not only affected by the domestic economy but also by the global environment. The dramatic fluctuation in real prime rate for last several years could be more attributed to the faster and larger movements in CPI.

The reason real prime rate is so closely related to the residential market is two-folded. One is that the low real prime rate means a real cost of owning a home and a high affordability with increasing income, a situation, which encourages more buyers, and vice versa. The other is that since the prime rate is perfectly correlated with other interest

rates, because of the control by the central bank, the low real prime rate also indicates a low real return on savings, which is by far the largest means for Chinese people to manage their income; thus, people turn to more aggressive investment to keep their wealth, and vice versa. Traditionally, Chinese people regard real property as the safest way to invest because it is tangible and hardly disappear. This makes the second, or more, home buyers become a major portion in the market when the market is hot, even though the precise figure is difficult to achieve.

Another implication in these results is that policy alone cannot change the whole market, where many policies have failed to control price movements in the past. If prices were not so high, the "second home mortgage policy" might not have such a strong impact on the market. Although we should never underestimate the importance of the government in exerting a certain amount of control over the residential market, the basic rule of market economy still works.

FORECAST

Based on the model we have established from our regression analyses, we have forecasted the short-term movements of China's residential market. We assume that the pattern revealed by our models shall remain the same.

We have forecasted the 14 cities' residential price movements for next the 12 month, from June 2009 to May 2010. We shall determine how national economic conditions affect the residential market, without changing city specific assumptions.

The challenge to predicting short-term residential market movement is to estimate the two exogenous variables: policy and real prime rate movements. We regard policy as an exogenous variable instead of endogenous because it changes at a time rather than gradually, as would be suggested by the model. Even if the model may have suggested a slight change in policy, the government may still stay and see the pressure to accumulate to a high level before acting. Since it is hard for us to time the policy changes, we do not want to risk our forecast by guessing on the policy changes. Instead, we have only applied the first two equations of the 3-month lag model to forecast short-term price and sales movements.

First, we have to guess the purpose of China's central government which determines the enforcement and cancelation of policy. Currently, despite many warnings that loose

monetary policy, aiming at floating the domestic economy out of the danger of slowing down, could lead to a new round of inflation (Andy Xie, 2009), the Central government is still cautious on economic recovery, largely due to a decline in export volume and high unemployment rate. As one of the most important pillars of the economy, real estate industry has gained political support since the financial crisis, as we described before. We expect this political support will continue till the full recovery. So we assume that the current policy regulating housing market shall remain stable.

Second, a much more challenging task is to forecast the real prime rate, which derives from nominal prime rate and CPI. **Exhibit 4.10** shows how CPI changed from January 2008 to May 2009. **Exhibit 4.11** was taken from an excerpt from IMF's "World Economic Outlook, April 2009" (Statistical Appendix Exhibit A7), which has estimated China's 2009 and 2010 average CPIs to be 0.1% and 0.7%, respectively. We share the same view with IMF where China's inflation level in the near term shall be relatively mild because of high over-capacity and relatively low GDP growth, not only domestically but also internationally. But IMF's April forecast may still overestimate 2009's CPI because the latest published data, uncovered by the April report, has presented more than expected deflation. IMF admitted this fact but has offered no new CPI forecast in its July updated report. Our assumptions regarding next 12 months' CPI are shown in **Exhibit 4.12**. We expect that the CPI shall emerge from negative zone by June, and reach 0.8% by the last quarter of year 2009, as forecasted by IMF. We expect the nominal prime rate to remain stable at the current 5.94% because of low inflation and the desire of the central bank to stimulate economy.

Exhibit 4.10: CPI from January 2008 To May 2009

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	7.1	8.7	8.3	8.5	7.7	7.1	6.3	4.9	4.6	4.0	2.4	1.2
2010	1.0	-1.6	-1.2	-1.5	-1.4							

Exhibit 4.11: IMF Forecast

Average			End of Period		
2009	2010	2014	2008	2009	2010
0.1	0.7	1.9	2.5	0.1	0.7

Exhibit 4.12: CPI Assumptions

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009						0.0	0.5	0.5	0.5	0.8	0.8	0.8
2010	0.7	0.7	0.7	0.7	0.7							

We have applied the 3-month lag model in our short-term residential market forecast. However, to forecast we still need to find out each city's constants of RPRICE and SALESLEV equation by setting each city as a dummy variable in the model **(Exhibit 4.13)**.

Exhibit 4.13: Constants of Each City

Dependent Variable RPRICE

Variable	Coeff	Std Error	T-Stat	Signif
1. RPRICE{3}	0.562463	0.038946	14.44224	0
2. SALESLEV{3}	364.334815	129.000425	2.82429	0.00492255
3. RPRIME	-88.739983	19.055872	-4.65683	0.00000409
4. SNDHDNPAY{3}	6.192647	5.60944	1.10397	0.27012322
5. SHENZHEN	5564.54626	550.654378	10.10533	0
6. GUANGHZOU	3600.699624	420.091962	8.57122	0
7. DONGGUAN	2282.388788	352.372067	6.47721	0
8. FOSHAN	2020.106271	340.906672	5.92569	0.00000001
9. SHANGHAI	5068.350928	515.65941	9.82887	0
10. WUXI	2131.012632	350.786415	6.07496	0
11. SUZHOU	2574.336289	369.802776	6.96138	0
12. HANGZHOU	4967.638058	516.635629	9.61536	0
13. NANJING	2398.261743	355.022195	6.75524	0
14. BEIJING	5013.016697	502.704142	9.9721	0
15. TIANJIN	2570.518145	364.03139	7.06125	0
16. SHENYANG	1314.296283	315.987028	4.15934	0.0000374
17. CHENGDU	2139.730426	346.414612	6.17679	0
18. WUHAN	2034.743361	341.881509	5.9516	0

Dependent Variable SALESLEV

Variable	Coeff	Std Error	T-Stat	Signif
1. RPRICE{3}	-0.000027478	0.000013642	-2.0143	0.0444982
2. SALESLEV{3}	0.42455942	0.045185031	9.39602	0
3. RPRIME	0.064083374	0.006674708	9.60093	0
4. SNDHDNPAY{3}	-0.003697277	0.001964821	-1.88174	0.06043652
5. SHENZHEN	0.837843186	0.192877932	4.3439	0.00001687
6. GUANGHZOU	0.690542495	0.147145782	4.69291	0.00000346
7. DONGGUAN	0.724078338	0.123425506	5.86652	0.00000001
8. FOSHAN	0.63246735	0.119409518	5.29662	0.00000018
9. SHANGHAI	0.799978642	0.180620231	4.42906	0.00001157
10. WUXI	0.735946208	0.1228701	5.98963	0
11. SUZHOU	0.706758816	0.129530968	5.45629	0.00000008
12. HANGZHOU	0.860093887	0.180962171	4.75289	0.00000261
13. NANJING	0.646288781	0.124353768	5.19718	0.00000029
14. BEIJING	0.764006115	0.176082383	4.33891	0.00001724
15. TIANJIN	0.687666172	0.127509423	5.39306	0.00000011
16. SHENYANG	0.61388289	0.110680904	5.54642	0.00000005
17. CHENGDU	0.707587414	0.121338786	5.8315	0.00000001
18. WUHAN	0.65213107	0.119750975	5.44573	0.00000008

The full forecasts for all 14 cities are shown in **Appendix K and L**. **Exhibit 4.14** and **4.15** shows the forecasted RPRICEs and SALESLEVs for the 1-tier cities, together with the real prime rates. **Exhibit 4.16** shows the percentage of each city's prices appreciation we anticipate for the next 12month. Here, we offer two series of growths: the first is the one based on the actual prices of May 2009; while, the other is based on the back-tested prices of the same month. As we can see, the latter series give a much encouraging growth. The reason is that the market's actual performance in the last three month has greatly exceeded our forecast, and has trimmed down the expected gain. **Exhibit 4.17** shows the comparison of the back-testing growth and actual growth. To avoid random noise, we have calculated two kinds of growth rates: one is the three month growth from February to May; while the other is the year to date growth from the end of 2008 to May 2009.

Exhibit 4.14: Forecast for 1-Tier Cities' Real Prices and Real Prime Rate

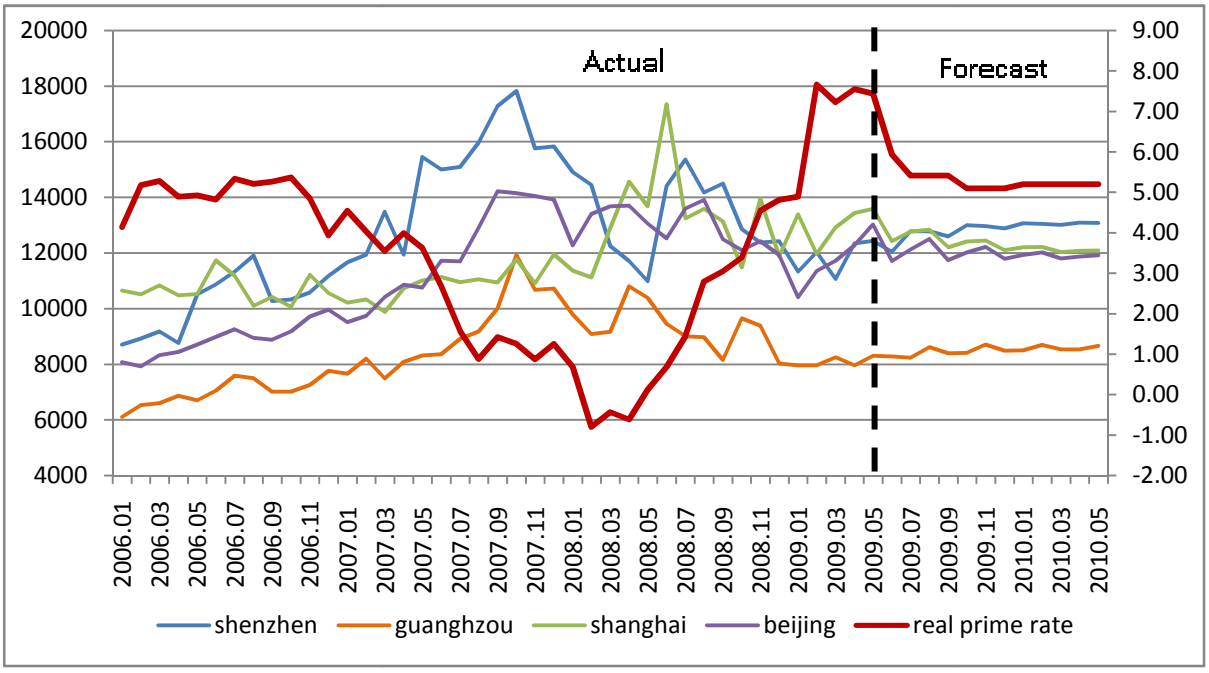


Exhibit 4.15: Forecast for 1-Tier Cities' SALESLEV and Real Prime Rate

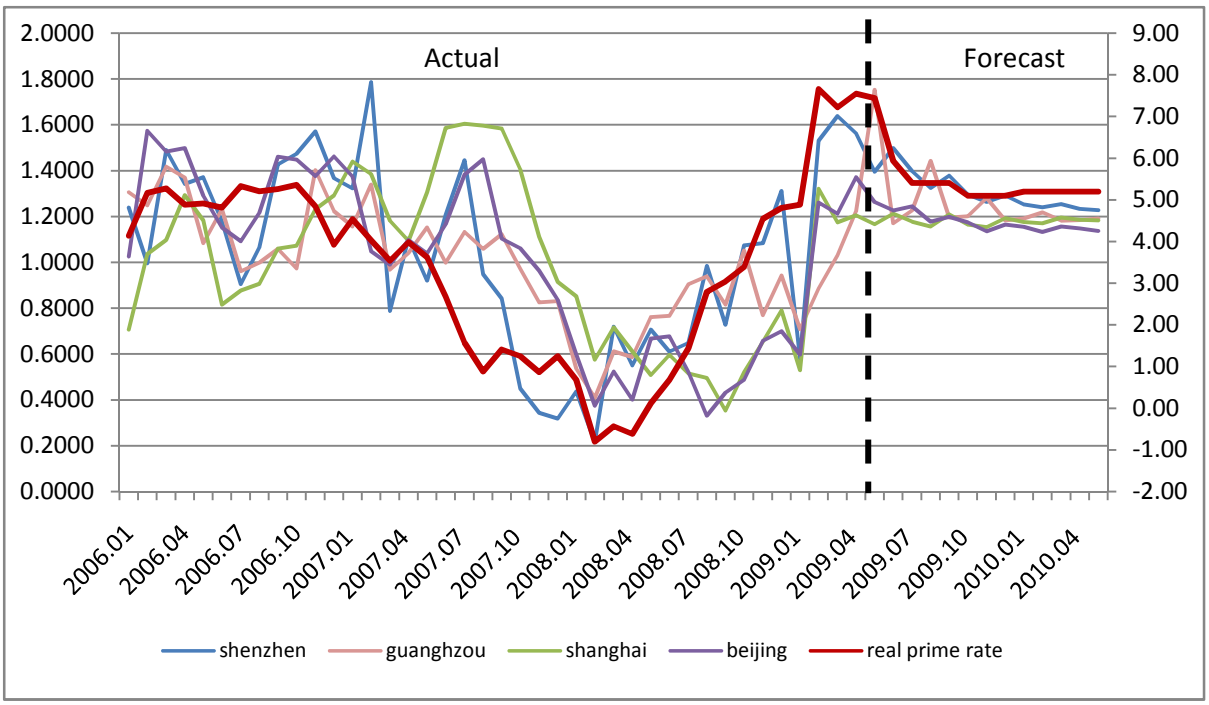


Exhibit 4.16: Percentage of Prices Appreciation for The 12 Month

	Price Growth relative to Actual May Prices	Prices Growth relative to Forecasted May Prices
Shenzhen	5.1%	5.3%
Guangzhou	4.3%	9.2%
Dongguan	-2.0%	-2.2%
Foshan	-8.8%	-2.0%
Shanghai	-11.0%	2.4%
Wuxi	-7.0%	-2.8%
Suzhou	-4.5%	-4.6%
Hangzhou	-6.9%	0.7%
Nanjing	-12.9%	5.3%
Beijing	-8.6%	4.6%
Tianjin	-7.0%	-2.1%
Shenyang	-10.6%	13.5%
Chengdu	0.0%	8.9%
Wuhan	-1.1%	-1.5%

Exhibit 4.17: Comparison of the back-Testing Growth and Actual Growth

RPRICE Growth

City	3-Month Growth		Year-To-Date Growth	
	Actual	Forecasted	Actual	Forecasted
Shenzhen	3.40%	3.20%	0.20%	0.00%
Guangzhou	4.30%	-0.40%	3.50%	-1.20%
Dongguan	11.60%	11.90%	4.30%	4.60%
Foshan	3.40%	-3.80%	7.30%	-0.10%
Shanghai	13.60%	-1.30%	14.50%	-0.60%
Wuxi	8.10%	3.40%	-6.20%	-10.20%
Suzhou	2.70%	2.80%	-6.90%	-6.80%
Hangzhou	2.80%	-4.90%	-1.20%	-8.60%
Nanjing	19.40%	-1.30%	14.40%	-5.40%
Beijing	14.80%	0.30%	9.30%	-4.50%
Tianjin	-2.60%	-7.50%	2.70%	-2.50%
Shenyang	19.10%	-6.10%	12.30%	-11.50%
Chengdu	11.60%	2.50%	7.20%	-1.50%
Wuhan	4.10%	4.50%	10.20%	10.60%
Correlation	0.09		0.28	

SALESLEV Growth

City	3-Month Growth		Year-To-Date Growth	
	Actual	Forecasted	Actual	Forecasted
Shenzhen	-8.90%	-0.50%	6.30%	16.10%
Guangzhou	97.70%	36.90%	86.00%	28.80%
Dongguan	-53.10%	-26.70%	44.90%	126.30%
Foshan	-34.20%	-5.10%	16.20%	67.60%
Shanghai	-11.70%	5.80%	47.40%	76.70%
Wuxi	-25.70%	-21.00%	119.50%	133.20%
Suzhou	-38.30%	-23.50%	103.50%	152.60%
Hangzhou	63.40%	32.50%	225.70%	164.10%
Nanjing	-17.90%	4.30%	53.50%	95.10%
Beijing	0.10%	7.30%	80.50%	93.40%
Tianjin	29.30%	7.60%	174.50%	128.40%
Shenyang	20.70%	24.80%	11.30%	15.10%
Chengdu	67.10%	-10.50%	352.80%	142.50%
Wuhan	-29.00%	-20.30%	68.10%	88.80%
Correlation	0.76		0.67	

According to the back-testing results, the model works quite well on forecasting the SALESLEV; but the RPRICE surge has greatly exceeded the forecast. It seems that the market became over optimistic seeing the SALESLEV recovery and the reversion of the up-trend of RPRIME; and that developers were pricing too aggressively. One explanation to over-optimistic sentiment is that the market expects the supply will be constrained by the low investment in 2008, a variable not covered in our model. But the outcome of this overshoot may not be preferable because the first-time home buyers may be frustrated and crowded out of the market. More seriously, if the central government regards this phenomenon as the start of another bubble, it may tighten the policy again, much earlier than we expect, adversely affecting the long-term health of the real estate market.

Our models have suggested that the recent residential market downturn may have bottomed and a moderate recovery shall be expected for most cities in the near term. However, actual market performances may turn out to be disappointing due to the recent prices surge which has come too fast and too much. According to our forecast, the remained potential exists only in Shenzhen and Guangzhou, which those two cities have recorded the deepest decline in 2008. The recent rally in sales should be attributed by large to the lift of the “second home mortgage policy” and lowered prices. But whether those high level sales are sustainable is questionable due to the unexpected rally in prices. Our models have shown that sales shall retreat slightly later, while maintaining at relatively high level compared to historical data. The slowdown in sales could constrain the potential of prices appreciation. Furthermore, since we have assumed the decline of real prime rate to be

moderate, due to slow increase in inflation, the macroeconomic environment is unlikely to support another strong market up-cycle any time soon.

Another scenario investors should be concerned is that inflation might increase faster than we have expected. If we maintain that the nominal prime rate shall remain constant, the real prime rate shall decline more than our assumptions and significantly drive up prices. This scenario may be good news to short-term speculators but shall hurt the longer term development and health of the residential market, because rational developments shall be destroyed and more anti-speculative measures could be imposed by the Central government. In the event inflation increases faster than anticipated leading to higher nominal interest rate, sales shall be anticipated to be curbed.

CHAPTER V

CONCLUSION

CAPITAL APPRECIATION POTENTIALS

Our model appears to suggest historical Average Sales Price growth trends are relatively good indicators of future Capital Appreciation potentials for the 35 Chinese cities, in which 7 out of the 10 cities with the greatest Capital Appreciation and 8 out of the 10 cities with the lowest Capital Appreciation during 1999-2007 are also ranked among the 10 cities with the greatest and lowest Capital Appreciation potentials in the 5 years to 2012, respectively. Such hypothesis may potentially be flawed amid our models' inability to capture the full cycle of the commercialized Chinese residential market, which is still relatively young in history.

In terms of collective performance by the tiers of cities, we observed that Tier II cities generally have stronger Capital Appreciation potentials during a market up-cycle, followed by Tier III and Tier IV cities, with Tier I cities having the least Capital Appreciation potentials of all tiers. There are two driving factors for this phenomenon: the first factor is the result of Tier I cities' high sensitivity to Prime Rate, in which Prime Rate typically increases during a market up-cycle negatively impacting the Average Sales Prices of Tier I cities; the second factor is Tier II cities' significantly high sensitivity to Population growth, 7 times more sensitive than Tier I cities and 100 times more sensitive than Tier III and Tier IV cities.

The data limitations in our panel regression analysis could have potentially led to results distortion by capturing only the booming stages of the Chinese residential development between 1999 and 2007, without taking into consideration the magnitude of the recent residential market down cycle in 2008 and 2009. Despite of the setbacks, our model should be relatively effective in predicting medium-term Average Sales Price trends during a market up-cycle. Regardless, our forecast models for Average Sales Price are heavily dependent on our independent forecasts for each of the four independent variables for all 35 Chinese cities, potentially diminishing the accuracies of results as too many unknowns are present.

Investors and developers should be aware of the relatively young history of the commercialized Chinese residential market that commenced in 1998 which has not yet experienced a full market cycle; thus, it is probably inappropriate to rely solely on quantitative data in the prediction of future Average Sales Price, without having a better understanding of the intangible values or conducting any risk assessments of the 35 Chinese cities.

Market prediction has always been a mixture of science and art, there is no guarantee that any models in this world can accurately predict the outcomes of future events. As such, our market prediction methodology should be viewed as a systematic approach to assessing the potentials of a city when making decisions to develop or invest in the China residential market; whereas, our prediction results, at best, shall be viewed as an academic indication of general future trend.

Our models are heavily based on the input of quantitative data which provides economic and demographic indications for the calculation of potential investment returns. However, in order to make informed investment decisions, risk as well as return shall be assessed equally by means of calculating a Sharpe ratio.

We recognize the differences in our method of predicting capital appreciation potentials among the 35 Chinese cities, compared to conventional methods used by real estate developers and investors by obtaining an overall market sentiment of any particular city. This thesis does not carry any implication that our prediction methodology is superior or inferior to those currently applied by real estate developers and investors.

DYNAMICS OF RECENT RESIDENTIAL MARKET FLUCTUATION

Our 14-city model suggests that strong Sales, low real prime rate, and loose mortgage policy contributed a lot to the over-heated prices in 2007. But irrationally high prices, combined with sharp strengthen of mortgage policy, in turn decreased sales. On the other hand, nominal prime rate was raised and CPI was down, pushing up the real prime rate together. With high real prime rate and low Sales, price bubble finally burst. But as soon as the policy turned favorable to the real estate market and real prime rate stopped increasing, the market regains its momentum quickly. Our model also suggests that policy change is actually an endogenous variable of the system, caused by the market situation. But our model does not answer why real prime rate is positively related with the Sales. Our explanation is that it is the nominal rate help curb the Sales while the nominal rate is negatively related to real rate.

Based on these findings, we predict that the market shall recover, helped by lowering real prime rate and favorable mortgage policy. Even though in general the early stage in recovery may suggest a good time to invest, it is still not easy to profit. One concern

is that the market may have over shot recently and erased future return. If IMF's CPI forecasts are accurate and the nominal prime rate does not decline further, the real prime rate shall not go down quickly in the next couple of years. Under such scenario, we do not expect residential prices to rise much in the near future. Thus, recent rally in prices may leave the return of new investment not that satisfactory. Another concern is policy. If the unexplained price appreciation continues, the PRC government may be forced to rein in; hence threaten the safety of new investment.

Our best scenario is that the economy will recover faster and stronger than IMF had predicted, and that residential prices shall rise gradually and moderately. Thus, the policy will be more likely to be kept stable and the rising prices will be supported by the steady drop in real prime rate. Given that current real prime rate is still at relatively high level compared with past years data, the room for future prices appreciation will be quite substantial.

We do not expect using this model to forecast more than one or two years, but this short-term forecast is still useful to residential developers. In China, most residential products are low-rise and high-rise condos, and the average construction period is 12 to 24 month. For residential developers, they still need to be very cautious on land purchasing. They have to pray for the best scenario if they are going to invest right now and expect a good return when their products are on sale.

Our model suggests that the price appreciation in the second half of 2009 maybe constrained by a slowdown in Sales growth. This can be a possible and favorable case because the policy risk will be avoided and more room for price growth will be saved. If the forecast of our model holds in practice, the best opportunity to invest will come later.

BIBLIOGRAPHY

Hongwei Bai, “Real Estate-Welcome the Industry Reversal”, China International Capital Corporation Limited, May 2009.

Huai Chen, “Why is China So Confident?-Ten Advantages Supporting China’s Real Estate Market”, Ministry of Housing and Urban-Rural Development, February 2009.
http://bj.house.sina.com.cn/chat/2009-02-27/1820301719.html

Jones Lang LaSalle report “CHINA30 – China’s Rising Urban Stars”, 2007.

Zhiqiang Ren, “Back Wave Push Front Wave: Land Prices and Housing Prices”, Huayuan Real Estate Corporation Limited, July 2009.
http://blog.sina.com.cn/s/blog_4679d3510100enx4.html

Sino-Ocean Land Holdings Limited, “Global Offering Prospectus”, 14 September 2007.

Soho China Limited, “Global Offering Prospectus”, 21 September 2007.

William C. Wheaton and Nai Jia Lee, “The Co-Movement of Housing Sales and Housing Prices: Empirics and Theory”, 2009.

Andy Xie, “Inflation Return”, May 2009.
http://xieguozhong.blog.sohu.com/116579073.html

Andy Xie “High Real Estate Price Probe”, November 2007.
http://xieguozhong.blog.sohu.com/94425462.html

China Real Estate Policies

Land auction policy (2004)
http://www.landchina.com/DesktopModule/BulletinMdl/BulContentView.aspx?BulID=59854

Sales tax policy (2005)
http://www.cin.gov.cn/zcfg/gwywj/200902/t20090218_185965.htm

90/70 policy, sales tax adjustment, 35% equity policy (2006)
http://www.gov.cn/zwgk/2006-05/29/content_294450.htm

Foreign real estate investment policy (2006)
http://www.mohurd.gov.cn/zcfg/jswj/fdcy/200611/t20061101_157771.htm

Second home mortgage policy (2007)
http://www.cbrc.gov.cn/chinese/home/jsp/docView.jsp?docID=2007092744521063F1480ADFFF0418047E498500

Modification of second home mortgage policy (2008)
http://www.cin.gov.cn/zcfg/gwywj/200812/t20081222_183732.htm

APPENDICES

Appendix A1: Correlation Table on Average Sales Price for 35 Chinese Cities

Potential Independent Variables	BeiJ	TianJ	ShijiaZ	TaiY	Hohhot	ShenY	Dalian	ChangC	Harbin	ShangH	NanJ	HangZ	Ningbo	Hefei	FuZ	XiaM	Jinan	QingD
GDP (real)	0.88	0.97	0.23	0.96	0.91	0.99	0.96	0.77	0.89	0.99	0.95	0.98	0.98	0.89	0.93	0.99	0.99	0.95
Freight volume	(0.55)	0.94	(0.19)	0.96	0.87	0.83	0.99	0.40	0.19	0.99	0.87	0.90	0.98	0.85	0.98	0.94	0.95	0.87
Import export transacted (real)	0.91	0.92	0.26	0.84	0.63	0.86	0.83	0.61	0.78	0.99	0.95	0.97	0.98	0.97	0.92	1.00	0.99	0.98
Population density	0.62	0.97	0.18	0.98	0.80	0.98	0.96	0.40	0.84	0.99	0.91	0.76	(0.54)	0.86	0.94	0.99	0.83	0.95
Total Road Area - urban	0.16	0.94	0.24	0.95	0.83	0.78	1.00	0.75	0.81	0.47	0.76	0.93	0.52	0.89	0.88	0.88	0.95	0.93
Infrastructure inv - public trans (real)	0.98	0.69	0.66	0.08	0.87	0.79	(0.28)	0.75	(0.22)	0.51	0.51	0.83	0.18	0.15	0.76	(0.67)	(0.09)	(0.15)
Infrastructure inv - roads & bridges (real)	0.89	0.66	0.45	(0.67)	(0.51)	0.84	0.95	0.67	0.81	0.86	(0.07)	0.44	0.99	0.93	0.95	0.77	0.19	0.80
City revenue (real)	0.88	0.98	0.37	0.95	0.94	0.97	1.00	0.86	0.88	0.99	0.93	0.98	0.98	0.95	0.96	0.88	0.99	0.93
City revenue - urban (real)	0.82	0.98	0.14	0.94	0.93	0.97	1.00	0.62	0.87	0.99	0.93	0.97	0.98	0.96	0.93	0.88	0.99	0.92
City spending (real)	0.90	0.97	0.50	0.91	0.87	0.99	1.00	0.80	0.88	1.00	0.98	0.97	0.98	0.98	0.99	0.94	0.99	0.94
City spending - urban (real)	0.79	0.95	0.21	0.89	0.92	0.99	0.99	0.65	0.89	1.00	0.91	0.94	0.96	0.98	0.93	0.96	0.97	0.91
Population (Registered)	0.51	0.96	0.19	0.98	0.83	0.98	0.95	0.79	0.86	0.99	0.91	0.94	0.97	0.93	0.94	0.99	0.99	0.83
Urban Population	0.77	0.94	(0.06)	0.98	0.82	0.96	0.91	0.70	0.84	0.99	0.88	0.96	0.92	0.77	0.82	0.96	0.99	0.97
Household	0.77	0.95	0.21	0.40	0.22	0.97	0.91	0.78	0.90	0.99	0.88	(0.87)	0.92	0.53	0.29	0.98	0.93	0.98
Employment	(0.45)	0.01	0.24	(0.59)	(0.65)	(0.56)	(0.09)	(0.16)	(0.68)	(0.75)	(0.23)	0.86	0.97	0.95	0.96	0.80	0.97	0.19
Unemployment	0.72	(0.04)	(0.19)	0.32	0.59	0.12	(0.61)	0.59	(0.13)	0.60	0.35	(0.49)	0.83	0.82	0.70	0.76	0.13	0.58
Mkt residential sales area	0.26	0.95	0.50	0.88	0.81	0.96	0.96	0.85	0.93	0.94	0.95	0.97	0.87	0.74	0.91	0.93	0.92	0.94
Mkt residential sales (real)	0.73	0.99	0.60	0.92	0.95	0.96	0.99	0.91	0.95	0.98	0.98	0.97	0.96	0.94	0.99	0.99	0.98	0.93
Mkt office ongoing construction area	0.70	0.96	(0.68)	0.87	0.85	0.82	(0.50)	0.69	(0.23)	0.66	0.77	0.95	0.94	0.96	(0.84)	0.24	(0.90)	0.84
Mkt office completed construction area	0.85	0.79	(0.29)	(0.01)	(0.04)	0.59	(0.41)	0.25	(0.06)	0.57	(0.34)	0.53	0.71	0.72	(0.74)	0.49	(0.31)	(0.11)
Mkt office started construction area	0.43	0.83	(0.34)	0.38	0.80	0.76	(0.01)	0.52	(0.38)	0.98	(0.18)	0.50	0.91	0.96	(0.40)	0.65	(0.38)	0.91
Mkt office sales area	0.89	0.93	(0.21)	0.51	0.37	0.38	(0.22)	0.43	0.05	0.92	0.79	0.93	0.91	0.92	(0.74)	0.71	0.07	0.78
Mkt office sales (real)	0.92	0.96	0.03	0.38	0.41	0.59	(0.12)	0.52	(0.12)	0.92	0.87	0.95	0.98	0.93	(0.73)	0.79	0.52	0.86
Mkt office average sales (real)	0.51	0.60	0.08	0.63	0.71	0.15	0.46	0.30	(0.14)	0.86	0.93	0.97	0.87	0.65	(0.23)	0.53	0.88	0.82
FDI utilized (real)	0.45	0.71	0.14	0.55	0.91	0.94	0.77	0.84	0.61	0.94	0.76	0.98	0.86	0.84	(0.63)	(0.24)	0.49	0.83
FDI utilized - urban (real)	0.43	0.68	0.54	0.54	0.85	0.94	0.83	0.84	0.60	0.94	0.76	0.98	0.82	0.84	(0.26)	(0.24)	0.25	0.70
Total passengers	(0.23)	0.98	(0.23)	0.93	0.72	0.83	0.96	0.46	0.45	0.96	0.94	0.96	0.97	0.96	0.92	0.93	0.57	0.89
Air passengers	0.79	0.96	0.49	0.97	(0.31)	0.95	0.97	0.58	0.90	0.97	0.98	0.98	0.98	0.99	0.65	0.98	0.98	0.97
Mobile subscriber	0.69	0.96	0.46	0.95	0.79	0.96	0.95	0.70	0.57	0.99	0.93	0.98	0.93	0.90	0.95	0.97	0.97	0.95
Mobile subscriber urban	(0.53)	(0.11)	(0.26)	0.09	0.06	(0.25)	(0.31)	(0.63)	(0.46)	(0.01)	(0.18)	0.02	(0.16)	(0.11)	(0.18)	0.15	0.01	0.21
Internet subscriber	(0.15)	0.60	0.41	0.80	0.84	0.38	0.21	0.87	0.31	0.99	0.95	0.89	0.82	(0.20)	0.77	0.85	0.59	0.91
SEI (real)	0.90	0.73	0.72	0.54	0.82	0.71	0.81	0.78	0.75	0.54	0.73	0.68	0.64	0.51	0.80	0.82	0.56	0.70
Prime rate (real)	(0.47)	(0.53)	(0.03)	(0.57)	(0.49)	(0.61)	(0.53)	(0.49)	(0.46)	(0.68)	(0.52)	(0.56)	(0.55)	(0.64)	(0.55)	(0.58)	(0.69)	(0.61)
SEI return (real)	0.70	0.67	0.57	0.45	0.77	0.58	0.64	0.38	0.48	0.47	0.68	0.61	0.61	0.53	0.71	0.72	0.51	0.60
Average Salary (real)	0.81	0.95	0.18	0.98	0.89	0.98	0.92	0.84	0.90	0.96	0.88	0.88	0.88	0.93	0.92	0.98	0.97	0.95
Savings (real)	0.64	0.94	0.17	0.97	0.90	0.90	0.82	0.69	0.79	0.97	0.91	0.94	0.96	0.88	0.90	0.99	0.97	0.96
Average consumer spending (real)	0.75	0.94	0.31	0.94	0.89	0.99	0.93	0.79	0.87	0.99	0.97	0.93	0.89	0.95	0.96	0.94	0.96	0.94
Average disposable income (real)	0.82	0.96	0.32	0.96	0.90	0.99	0.94	0.80	0.90	0.99	0.98	0.98	0.96	0.98	0.94	0.98	0.97	0.94
GDP per capita (real)	0.86	0.97	0.21	0.95	0.90	0.99	0.95	0.76	0.90	0.99	0.95	0.98	0.97	0.87	0.89	0.99	0.99	0.96
Mkt residential ongoing construction area	0.29	0.98	0.45	0.96	0.96	0.98	0.98	0.94	0.88	0.94	0.95	0.95	0.83	0.82	0.98	0.94	0.97	0.95
Mkt residential completed construction area	0.21	0.94	0.54	0.57	0.80	0.94	(0.12)	0.92	0.83	0.91	0.84	0.95	0.75	0.48	0.31	0.38	0.76	0.97
Mkt residential start construction area	(0.21)	0.97	0.43	0.95	0.99	0.95	0.91	0.89	0.76	0.28	0.83	0.66	0.49	0.77	0.94	0.77	0.88	0.97
Land acquisition area	(0.58)	0.49	0.10	0.50	0.88	0.94	0.46	0.85	0.74	(0.17)	0.12	(0.16)	(0.31)	(0.33)	0.39	(0.13)	0.19	0.42
Land completion area	(0.42)	0.93	0.57	0.25	0.56	0.95	0.47	(0.85)	0.45	0.24	(0.08)	(0.42)	0.45	(0.34)	(0.80)	0.20	0.37	0.98
Cumulative supply (sm)	0.79	0.96	0.30	0.98	0.89	0.99	0.89	0.84	0.92	0.99	0.94	0.97	0.97	0.96	0.91	0.88	0.99	0.98

Appendix A2: Correlation Table on Average Sales Price for 35 Chinese Cities

Potential Independent Variables	GuangZ	ShenZ	NanC	ZhengZ	Wuhan	ChangS	NanN	Haikou	ChongQ	ChengD	GuiY	KunM	Xian	LanZ	Xining	YinCh	UrumQ
GDP (real)	0.88	0.88	0.98	0.91	0.89	0.94	0.98	0.90	0.99	0.96	0.91	0.89	0.95	0.95	0.98	0.82	0.84
Freight volume	0.70	0.92	0.97	0.96	0.96	0.91	0.92	0.85	0.98	0.64	0.87	0.11	0.71	0.90	0.81	0.81	0.20
Import export transacted (real)	0.86	0.90	0.94	0.94	0.91	0.94	0.90	0.63	0.98	0.99	0.86	0.90	0.94	0.59	0.83	0.66	0.70
Population density	0.81	0.88	0.98	0.70	(0.60)	0.91	0.95	0.85	0.99	0.89	0.83	0.90	0.97	0.89	(0.05)	(0.87)	0.39
Total Road Area - urban	0.66	0.63	0.94	0.91	0.81	0.84	0.95	0.75	0.87	0.73	0.67	0.78	0.95	0.93	0.86	0.88	0.83
Infrastructure inv - public trans (real)	0.86		0.04	0.23	0.49	(0.17)	0.26	(0.76)	0.30	0.85	0.11	(0.14)	0.93	(0.18)	0.11	0.71	0.27
Infrastructure inv - roads & bridges (real)	(0.28)	0.92	0.71	0.61	0.93	0.51	0.85	0.96	0.98	0.94	(0.38)	0.52	0.78	0.77	(0.46)	0.53	(0.53)
City revenue (real)	0.90	0.95	0.97	0.89	0.97	0.95	0.95	0.91	0.99	0.98	0.87	0.88	0.93	0.94	0.96	0.87	0.87
City revenue - urban (real)	0.89	0.95	0.96	0.90	0.76	0.94	0.98	0.91	0.79	0.91	0.86	0.94	0.93	0.94	0.96	0.87	0.86
City spending (real)	0.88	0.84	0.96	0.94	0.94	0.95	0.97	0.83	0.99	0.98	0.94	0.89	0.93	0.93	0.98	0.83	0.91
City spending - urban (real)	0.83	0.85	0.96	0.92	0.95	0.95	0.94	0.85	0.80	0.92	0.93	0.93	0.94	0.93	0.94	0.87	0.91
Population (Registered)	0.81	0.88	0.98	0.72	0.67	0.91	0.95	0.84	0.99	0.97	0.83	0.90	0.98	0.90	0.76	0.97	0.91
Urban Population	0.92	0.84	0.98	0.82	0.84	0.91	0.95	0.79	0.95	0.97	0.84	0.88	0.97	0.92	0.53	0.91	0.90
Household	0.79	0.77	0.95	0.81	0.75	0.91	0.78	0.85	0.98	0.97	0.15	0.91	0.98	0.92	0.69	0.96	0.90
Employment	0.13	0.61	(0.05)	0.66	0.19	0.97	0.83	0.82	0.57	0.88	0.91	(0.24)	0.87	(0.20)	(0.19)	(0.73)	(0.51)
Unemployment	(0.06)	0.58	0.93	0.74	(0.15)	0.76	(0.07)	(0.26)	0.03	(0.22)	(0.13)	0.39	0.84	0.18	0.77	0.84	(0.37)
Mkt residential sales area	0.77	0.35	0.93	0.90	0.83	0.96	0.97	0.89	0.98	0.96	0.89	0.76	0.74	0.98	0.97	0.78	0.92
Mkt residential sales (real)	0.95	0.73	0.94	0.92	0.92	0.97	1.00	0.96	0.97	0.97	0.96	0.80	0.84	0.99	0.99	0.81	0.96
Mkt office ongoing construction area	0.73	0.87	0.80	0.76	(0.25)	0.84	0.84	0.72	0.78	0.70	0.64	(0.63)	0.64	0.04	(0.34)	0.90	0.04
Mkt office completed construction area	0.24	0.54	0.75	0.80	0.24	(0.36)	0.44	0.88	0.09	(0.22)	0.20	(0.49)	0.32	(0.01)	(0.22)	0.52	0.06
Mkt office started construction area	0.11	0.32	(0.15)	0.83	0.05	0.55	0.57	0.70	0.17	0.62	(0.06)	(0.37)	0.54	0.02	(0.11)	0.47	(0.16)
Mkt office sales area	0.89	0.52	(0.21)	0.81	0.22	0.59	0.48	0.67	0.88	0.78	0.78	0.77	0.55	0.15	0.28	0.45	0.59
Mkt office sales (real)	0.95	0.77	0.18	0.87	0.41	0.76	0.90	0.78	0.90	0.82	0.85	0.80	0.55	0.29	0.25	0.43	0.44
Mkt office average sales (real)	0.77	0.90	0.71	0.62	0.79	0.72	0.76	0.47	0.78	0.79	0.20	0.65	0.53	0.76	0.02	0.64	0.35
FDI utilized (real)	0.29	0.35	0.98	0.81	0.75	0.95	0.60	0.69	0.95	0.83	0.33	0.77	0.88	0.81	0.56	0.75	0.81
FDI utilized - urban (real)	0.39	0.36	0.97	0.79	0.70	0.93	0.51	0.69	0.95	0.95	0.27	0.81	0.69	0.81	0.56	0.75	0.81
Total passengers	0.77	0.75	0.84	0.90	0.96	0.76	0.88	0.71	0.83	(0.34)	0.89	0.77	0.44	0.94	0.78	0.62	0.35
Air passengers	(0.05)	0.89	0.93	0.84	0.96	0.95	0.99	0.94	0.99	0.98	0.93	0.89	0.75	0.93	0.96	0.72	0.29
Mobile subscriber	0.83	0.89	0.97	0.90	0.80	0.93	0.89	0.94	0.95	0.98	0.95	0.72	0.97	0.94	0.97	0.77	0.53
Mobile subscriber urban	(0.30)	(0.35)	0.03	(0.17)	(0.27)	(0.24)	(0.02)	(0.36)	0.04	(0.07)	(0.35)	(0.16)	0.24	(0.11)	(0.11)	0.28	(0.70)
Internet subscriber	(0.26)	0.07	0.94	0.86	0.65	0.57	0.56	0.35	0.84	0.90	0.19	0.90	(0.02)	0.87	0.76	0.41	0.35
SEI (real)	0.91	0.91	0.59	0.81	0.75	0.92	0.68	0.80	0.69	0.73	0.81	0.59	0.50	0.65	0.76	0.30	0.82
Prime rate (real)	(0.51)	(0.58)	(0.68)	(0.47)	(0.60)	(0.48)	(0.65)	(0.54)	(0.61)	(0.55)	(0.56)	(0.55)	(0.55)	(0.69)	(0.61)	(0.41)	(0.43)
SEI return (real)	0.70	0.66	0.53	0.64	0.64	0.72	0.43	0.59	0.58	0.68	0.70	0.41	0.45	0.59	0.67	0.26	0.44
Average Salary (real)	0.62	0.55	0.99	0.92	0.95	0.92	0.97	0.80	0.98	0.95	0.93	0.89	0.97	0.94	0.91	0.84	0.85
Savings (real)	0.75	0.76	0.98	0.88	0.82	0.84	0.88	0.77	0.95	0.92	0.88	0.89	0.97	0.88	0.93	0.92	0.69
Average consumer spending (real)	0.95	0.76	0.95	0.92	0.95	0.96	0.88	0.91	0.98	0.94	0.96	0.61	0.96	0.92	0.91	0.88	0.84
Average disposable income (real)	0.88	0.81	0.99	0.93	0.95	0.95	0.93	0.90	0.98	0.93	0.93	0.86	0.95	0.93	0.94	0.86	0.83
GDP per capita (real)	0.87	0.82	0.98	0.64	0.51	0.94	0.98	0.90	0.99	0.95	0.91	0.89	0.95	0.94	0.95	0.76	0.76
Mkt residential ongoing construction area	0.63	0.42	0.99	0.91	0.79	0.94	0.93	0.91	0.98	0.97	0.92	0.83	0.89	0.89	0.97	0.85	0.65
Mkt residential completed construction area	(0.19)	(0.32)	0.91	0.85	0.75	0.95	0.91	0.74	0.92	0.58	0.39	0.36	0.14	0.93	0.75	0.81	0.58
Mkt residential start construction area	0.59	(0.08)	0.97	0.86	0.73	0.94	0.87	0.90	0.96	0.95	0.91	0.74	0.78	0.40	0.91	0.86	0.67
Land acquisition area	(0.49)	(0.71)	0.25	0.92	0.49	0.18	(0.27)	0.48	0.77	0.24	0.63	0.47	(0.02)	0.39	0.27	0.69	0.15
Land completion area	(0.59)	(0.66)	0.74	0.64	0.64	0.75	0.31	0.59	0.86	0.64	(0.26)	(0.23)	0.51	(0.44)	0.42	0.59	0.65
Cumulative supply (sm)	0.78	0.79	0.97	0.94	0.96	0.87	0.91	0.93	0.99	0.93	0.88	0.90	0.97	0.96	0.95	0.84	0.79

Appendix B: 35 Chinese Cities Nominal GDP Growth Historical and Forecast

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008F	2009F	2010F	2011F	2012F
Beijing	15.8%	12.0%	11.1%	8.1%	14.0%	14.8%	12.9%	14.0%	16.9%	60.8%	14.3%	18.8%	15.8%	7.8%	9.5%	10.7%	10.7%
Changchun	34.5%	10.9%	12.5%	16.1%	21.8%	16.5%	14.7%	16.3%	14.7%	9.3%	3.7%	20.0%	16.7%	8.2%	10.0%	11.3%	11.3%
Changsha	24.9%	20.7%	12.4%	8.4%	11.6%	10.9%	11.6%	14.3%	22.0%	34.0%	18.4%	21.8%	18.2%	9.0%	10.9%	12.3%	12.3%
Chengdu	15.4%	17.5%	9.5%	7.9%	10.3%	13.6%	11.7%	12.2%	16.8%	8.5%	16.0%	20.9%	17.5%	8.6%	10.5%	11.8%	11.8%
Chongqing	21.8%	55.3%	5.9%	3.5%	7.4%	10.1%	12.7%	14.2%	18.4%	15.2%	13.5%	18.3%	15.3%	7.5%	9.2%	10.4%	10.4%
Dalian	13.6%	13.1%	11.7%	8.3%	10.7%	11.2%	13.8%	16.1%	20.2%	9.7%	19.4%	21.8%	18.3%	9.0%	11.0%	12.4%	12.4%
Fuzhou	25.7%	19.5%	14.8%	9.2%	6.3%	7.1%	8.0%	16.1%	14.9%	-4.7%	12.7%	18.7%	15.6%	7.7%	9.4%	10.6%	10.6%
Guangzhou	16.2%	13.9%	11.9%	11.7%	15.5%	13.0%	11.8%	16.5%	17.7%	25.2%	17.7%	17.2%	14.4%	7.1%	8.6%	9.7%	9.7%
Guiyan	44.6%	16.1%	11.2%	8.2%	11.5%	14.3%	11.1%	13.2%	16.5%	18.5%	14.7%	15.1%	12.6%	6.2%	7.6%	8.5%	8.5%
Haikou	5.4%	5.8%	5.5%	7.4%	12.8%	9.0%	11.7%	40.7%	10.6%	19.1%	16.2%	12.4%	10.4%	5.1%	6.3%	7.1%	7.1%
Hangzhou	19.0%	14.3%	9.5%	8.0%	12.8%	13.4%	13.6%	17.8%	19.8%	17.0%	16.9%	19.2%	16.0%	7.9%	9.6%	10.9%	10.9%
Harbin	62.0%	17.1%	9.4%	8.2%	13.5%	11.7%	10.0%	14.8%	18.8%	8.9%	14.4%	16.4%	13.7%	6.8%	8.2%	9.3%	9.3%
Hefei	26.3%	17.7%	8.6%	8.9%	10.3%	11.9%	13.6%	17.5%	21.6%	44.7%	25.8%	24.3%	20.3%	10.0%	12.2%	13.8%	13.8%
Hohhot	29.7%	12.6%	11.7%	9.4%	14.5%	17.8%	50.0%	28.3%	26.1%	45.2%	21.0%	22.3%	18.7%	9.2%	11.2%	12.7%	12.7%
Jinan	27.1%	19.6%	12.2%	7.3%	8.0%	12.0%	12.6%	13.7%	18.6%	15.9%	16.5%	17.2%	14.4%	7.1%	8.7%	9.8%	9.8%
Kunming	30.5%	13.3%	11.8%	8.6%	5.8%	7.5%	8.5%	11.2%	16.0%	12.7%	13.3%	16.8%	14.1%	6.9%	8.4%	9.5%	9.5%
Lanzhou	7.3%	5.8%	6.5%	6.1%	12.4%	12.7%	10.9%	13.8%	14.7%	12.4%	12.6%	14.8%	12.4%	6.1%	7.4%	8.4%	8.4%
Nanchang	25.4%	19.6%	5.6%	5.2%	8.8%	11.6%	13.7%	16.0%	20.2%	30.8%	17.5%	17.4%	14.6%	7.2%	8.7%	9.9%	9.9%
Nanjing	17.1%	11.9%	9.3%	9.0%	13.6%	12.6%	12.8%	21.5%	21.2%	26.2%	15.0%	18.4%	15.4%	7.6%	9.2%	10.4%	10.4%
Nanning	15.6%	14.5%	11.6%	6.2%	7.2%	10.4%	9.6%	41.1%	17.2%	22.8%	20.3%	22.9%	19.1%	9.4%	11.5%	13.0%	13.0%
Ningbo	24.8%	12.8%	8.5%	7.0%	12.9%	11.6%	14.3%	19.1%	20.8%	13.5%	17.4%	19.5%	16.3%	8.1%	9.8%	11.1%	11.1%
Qingdao	10.6%	12.3%	11.4%	11.8%	15.8%	14.4%	15.4%	17.3%	21.5%	24.6%	18.9%	18.1%	15.1%	7.5%	9.1%	10.3%	10.3%
Shanghai	17.9%	15.8%	9.8%	9.4%	12.8%	8.8%	9.2%	15.6%	19.2%	22.9%	12.5%	18.4%	15.4%	7.6%	9.2%	10.4%	10.4%
Shenyang	13.1%	10.3%	10.3%	7.9%	10.5%	10.5%	13.2%	14.5%	18.5%	9.7%	19.1%	29.8%	24.9%	12.3%	15.0%	16.9%	16.9%
Shenzhen	19.4%	18.9%	14.1%	11.4%	15.9%	17.4%	15.5%	28.3%	18.2%	44.6%	14.8%	19.7%	16.5%	8.1%	9.9%	11.2%	11.2%
Shijiazhuang	21.5%	19.0%	8.2%	7.4%	10.4%	8.2%	9.3%	16.1%	12.8%	14.9%	15.5%	14.4%	12.0%	5.9%	7.2%	8.2%	8.2%
Taiyuan	21.5%	6.4%	4.1%	3.0%	4.4%	11.2%	12.0%	19.1%	24.2%	39.4%	13.5%	23.8%	20.0%	9.8%	12.0%	13.5%	13.5%
Tianjin	19.8%	12.5%	7.7%	8.5%	13.1%	12.2%	11.5%	19.3%	19.8%	26.1%	17.9%	15.9%	13.3%	6.5%	8.0%	9.0%	9.0%
Urumqi	12.2%	8.1%	7.0%	7.2%	10.5%	14.5%	12.5%	15.3%	18.5%	16.2%	16.3%	25.4%	21.2%	10.5%	12.7%	14.4%	14.4%
Wuhan	28.9%	16.6%	11.4%	6.9%	11.2%	11.7%	10.8%	11.4%	17.7%	14.4%	15.7%	21.3%	17.8%	8.8%	10.7%	12.1%	12.1%
Xiamen	23.1%	20.5%	12.4%	9.6%	9.5%	11.2%	16.1%	17.2%	16.3%	14.0%	16.0%	18.8%	15.8%	7.8%	9.5%	10.7%	10.7%
Xian	24.2%	22.0%	11.3%	10.1%	12.2%	6.6%	12.2%	14.3%	16.4%	15.9%	14.2%	21.6%	18.1%	8.9%	10.9%	12.3%	12.3%
Xining	7.3%	11.7%	10.7%	9.3%	25.8%	13.6%	16.1%	19.4%	20.7%	36.0%	18.5%	21.6%	18.1%	8.9%	10.9%	12.3%	12.3%
Yinchuan	13.3%	12.3%	7.3%	8.1%	8.5%	10.3%	27.3%	17.5%	20.5%	52.7%	16.2%	21.9%	18.3%	9.0%	11.0%	12.4%	12.4%
Zhengzhou	29.4%	13.9%	8.0%	3.3%	15.2%	12.2%	12.1%	18.7%	25.0%	20.5%	20.5%	24.2%	20.3%	10.0%	12.2%	13.8%	13.8%

Source: Historical data provided by realestate.cei.gov.cn

Appendix C: 35 Chinese Cities Real GDP per Registered Capita Historical and Forecast (in RMB per Capita) - 2012F Ranking

	City	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008F	2009F	2010F	2011F	2012F
1	Shenzhen*	136,873	151,620	167,163	184,269	215,837	224,456	289,473	302,659	320,255	326,441	326,801	330,513	334,486	338,507
2	Shanghai	35,090	39,167	42,135	46,157	52,414	59,655	71,585	78,879	88,398	95,651	102,092	109,977	118,467	127,613
3	Guangzhou	34,287	38,567	42,570	47,424	54,252	60,418	73,050	83,969	91,912	97,529	102,513	108,649	115,073	121,876
4	Beijing	19,867	25,456	28,639	32,192	35,875	39,886	62,040	68,872	77,092	83,197	88,423	94,882	101,835	109,298
5	Xiamen	40,572	43,485	46,936	53,822	60,294	65,163	69,881	76,324	82,986	87,311	90,474	94,654	99,047	103,644
6	Ningbo	22,095	24,722	27,288	31,276	36,614	42,282	46,800	53,750	60,844	66,392	71,187	77,102	83,556	90,551
7	Hangzhou	22,713	25,299	28,150	31,859	36,754	41,791	47,394	54,121	60,983	66,152	70,595	76,080	82,023	88,430
8	Shenyang	17,088	18,580	20,260	23,139	26,179	29,663	31,735	36,978	45,383	53,165	59,226	67,143	76,558	87,294
9	Dalian	21,006	22,909	25,164	28,695	32,791	37,833	40,496	47,075	54,146	59,955	64,729	70,714	77,391	84,699
10	Hohhot	8,597	9,742	11,257	16,894	21,367	25,828	37,053	43,711	49,861	55,035	59,130	64,309	70,087	76,383
11	Nanjing	19,111	21,319	23,493	26,229	30,993	35,440	43,047	47,872	53,206	57,000	60,232	64,238	68,508	73,062
12	Tianjin	18,193	20,445	22,740	25,412	29,739	34,045	41,874	48,145	52,658	55,826	58,893	62,582	66,409	70,470
13	Qingdao	16,128	18,511	20,922	24,154	27,795	32,048	38,704	44,844	49,955	53,738	57,078	61,174	65,552	70,243
14	Jinan	18,048	19,249	21,165	23,778	26,369	29,708	33,412	37,968	42,371	45,496	48,375	51,868	55,577	59,552
15	Wuhan	16,749	18,322	20,077	22,128	23,939	26,951	29,707	33,142	37,936	41,681	44,729	48,551	52,781	57,380
16	Zhengzhou	11,892	13,366	14,641	16,359	18,760	22,232	25,988	30,312	35,173	39,198	42,260	46,184	50,627	55,497
17	Taiyuan	12,667	12,800	13,839	15,296	17,722	20,895	27,911	30,446	35,320	39,248	42,246	46,083	50,410	55,144
18	Changsha	11,537	12,741	14,007	15,543	17,378	20,116	26,038	29,878	34,364	37,941	40,855	44,513	48,584	53,027
19	Chengdu	13,541	14,737	16,524	18,456	20,155	22,335	23,306	26,124	29,886	32,799	35,211	38,222	41,544	45,154
20	Hefei	7,821	8,429	9,284	10,489	11,950	14,360	19,925	23,945	27,868	31,173	33,730	36,996	40,703	44,782
21	Fuzhou	18,475	19,366	20,422	22,114	25,068	27,516	25,542	28,005	31,328	33,837	36,014	38,696	41,582	44,684
22	Changchun	11,681	13,997	16,053	18,380	20,960	22,959	24,408	24,683	28,006	30,593	32,785	35,504	38,479	41,704
23	Urumqi	17,877	19,028	21,049	22,966	25,323	28,199	30,819	33,973	35,464	36,980	37,171	37,904	38,792	39,701
24	Nanchang	10,763	11,441	12,461	14,012	16,000	18,106	22,558	25,637	28,289	30,101	31,700	33,667	35,737	37,935
25	Kunming	14,278	14,811	15,594	16,800	18,243	20,286	22,208	24,517	27,140	28,981	30,695	32,771	34,956	37,287
26	Yinchuan	10,482	10,708	11,394	11,429	13,262	14,851	21,827	24,287	27,462	29,424	30,736	32,489	34,404	36,433
27	Xian	10,390	11,382	11,929	13,345	14,784	16,368	18,215	20,173	23,078	25,365	27,200	29,510	32,072	34,855
28	Harbin	10,880	12,202	13,443	14,794	16,680	18,755	19,973	22,386	24,681	26,303	27,844	29,703	31,649	33,724
29	Shijiazhuang	11,850	12,822	13,684	14,948	17,027	18,350	20,496	23,024	24,718	25,807	26,952	28,320	29,691	31,129
30	Haikou	24,876	12,044	12,692	13,806	18,499	19,151	21,762	24,322	25,741	26,293	27,054	27,964	28,809	29,680
31	Lanzhou	10,929	12,108	13,285	14,633	16,268	17,736	19,349	21,334	22,950	23,975	25,018	26,274	27,539	28,864
32	Guiyan	8,439	9,084	10,183	11,250	12,427	13,812	15,945	17,822	19,280	20,233	21,187	22,335	23,502	24,730
33	Nanning	10,967	5,353	5,825	6,391	8,811	9,827	11,667	13,572	15,640	17,335	18,671	20,364	22,262	24,338
34	Chongqing*	5,500	5,849	6,380	7,208	8,090	9,180	10,306	11,421	12,742	13,748	14,639	15,729	16,900	18,157
35	Xining	6,237	5,998	6,690	7,746	9,005	10,326	13,900	15,801	15,902	16,243	16,188	16,324	16,488	16,653

**Shenzhen's Registered-to-Total Population ratio is particularly low, overestimating Real GDP per Capita; Chongqing behaves more like a province rather than a city amid its much larger geographical area, underestimating Real GDP per Capita*

Appendix D: 35 Chinese Cities Real GDP per Registered Capita Growth Historical and Forecast - 2012F Ranking

	City	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008F	2009F	2010F	2011F	2012F
1	Shenyang	6.1%	8.7%	9.0%	14.2%	13.1%	13.3%	7.0%	16.5%	22.7%	17.1%	11.4%	13.4%	14.0%	14.0%
2	Hefei	6.4%	7.8%	10.1%	13.0%	13.9%	20.2%	38.7%	20.2%	16.4%	11.9%	8.2%	9.7%	10.0%	10.0%
3	Zhengzhou	0.3%	12.4%	9.5%	11.7%	14.7%	18.5%	16.9%	16.6%	16.0%	11.4%	7.8%	9.3%	9.6%	9.6%
4	Dalian	6.4%	9.1%	9.8%	14.0%	14.3%	15.4%	7.0%	16.2%	15.0%	10.7%	8.0%	9.2%	9.4%	9.4%
5	Taiyuan	0.1%	1.1%	8.1%	10.5%	15.9%	17.9%	33.6%	9.1%	16.0%	11.1%	7.6%	9.1%	9.4%	9.4%
6	Nanning	4.3%	-51.2%	8.8%	9.7%	37.9%	11.5%	18.7%	16.3%	15.2%	10.8%	7.7%	9.1%	9.3%	9.3%
7	Changsha	5.9%	10.4%	9.9%	11.0%	11.8%	15.8%	29.4%	14.7%	15.0%	10.4%	7.7%	9.0%	9.1%	9.1%
8	Hohhot	6.1%	13.3%	15.6%	50.1%	26.5%	20.9%	43.5%	18.0%	14.1%	10.4%	7.4%	8.8%	9.0%	9.0%
9	Wuhan	4.2%	9.4%	9.6%	10.2%	8.2%	12.6%	10.2%	11.6%	14.5%	9.9%	7.3%	8.5%	8.7%	8.7%
10	Chengdu	5.7%	8.8%	12.1%	11.7%	9.2%	10.8%	4.3%	12.1%	14.4%	9.7%	7.4%	8.6%	8.7%	8.7%
11	Xian	7.6%	9.5%	4.8%	11.9%	10.8%	10.7%	11.3%	10.7%	14.4%	9.9%	7.2%	8.5%	8.7%	8.7%
12	Changchun	13.8%	19.8%	14.7%	14.5%	14.0%	9.5%	6.3%	1.1%	13.5%	9.2%	7.2%	8.3%	8.4%	8.4%
13	Ningbo	4.9%	11.9%	10.4%	14.6%	17.1%	15.5%	10.7%	14.8%	13.2%	9.1%	7.2%	8.3%	8.4%	8.4%
14	Hangzhou	5.7%	11.4%	11.3%	13.2%	15.4%	13.7%	13.4%	14.2%	12.7%	8.5%	6.7%	7.8%	7.8%	7.8%
15	Shanghai	7.4%	11.6%	7.6%	9.5%	13.6%	13.8%	20.0%	10.2%	12.1%	8.2%	6.7%	7.7%	7.7%	7.7%
16	Fuzhou	7.1%	4.8%	5.4%	8.3%	13.4%	9.8%	-7.2%	9.6%	11.9%	8.0%	6.4%	7.4%	7.5%	7.5%
17	Chongqing	1.7%	6.3%	9.1%	13.0%	12.2%	13.5%	12.3%	10.8%	11.6%	7.9%	6.5%	7.5%	7.4%	7.4%
18	Beijing	4.4%	28.1%	12.5%	12.4%	11.4%	11.2%	55.5%	11.0%	11.9%	7.9%	6.3%	7.3%	7.3%	7.3%
19	Qingdao	9.7%	14.8%	13.0%	15.4%	15.1%	15.3%	20.8%	15.9%	11.4%	7.6%	6.2%	7.2%	7.2%	7.2%
20	Jinan	5.1%	6.7%	10.0%	12.3%	10.9%	12.7%	12.5%	13.6%	11.6%	7.4%	6.3%	7.2%	7.2%	7.2%
21	Kunming	-11.8%	3.7%	5.3%	7.7%	8.6%	11.2%	9.5%	10.4%	10.7%	6.8%	5.9%	6.8%	6.7%	6.7%
22	Nanjing	6.5%	11.6%	10.2%	11.6%	18.2%	14.3%	21.5%	11.2%	11.1%	7.1%	5.7%	6.7%	6.6%	6.6%
23	Harbin	6.1%	12.2%	10.2%	10.0%	12.7%	12.4%	6.5%	12.1%	10.3%	6.6%	5.9%	6.7%	6.6%	6.6%
24	Nanchang	1.7%	6.3%	8.9%	12.4%	14.2%	13.2%	24.6%	13.6%	10.3%	6.4%	5.3%	6.2%	6.1%	6.1%
25	Tianjin	6.4%	12.4%	11.2%	11.7%	17.0%	14.5%	23.0%	15.0%	9.4%	6.0%	5.5%	6.3%	6.1%	6.1%
26	Guangzhou	8.4%	12.5%	10.4%	11.4%	14.4%	11.4%	20.9%	14.9%	9.5%	6.1%	5.1%	6.0%	5.9%	5.9%
27	Yinchuan	5.5%	2.2%	6.4%	0.3%	16.0%	12.0%	47.0%	11.3%	13.1%	7.1%	4.5%	5.7%	5.9%	5.9%
28	Guiyan	4.8%	7.6%	12.1%	10.5%	10.5%	11.1%	15.4%	11.8%	8.2%	4.9%	4.7%	5.4%	5.2%	5.2%
29	Shijiazhuang	4.9%	8.2%	6.7%	9.2%	13.9%	7.8%	11.7%	12.3%	7.4%	4.4%	4.4%	5.1%	4.8%	4.8%
30	Lanzhou	3.3%	10.8%	9.7%	10.1%	11.2%	9.0%	9.1%	10.3%	7.6%	4.5%	4.3%	5.0%	4.8%	4.8%
31	Xiamen	6.1%	7.2%	7.9%	14.7%	12.0%	8.1%	7.2%	9.2%	8.7%	5.2%	3.6%	4.6%	4.6%	4.6%
32	Haikou	2.8%	-51.6%	5.4%	8.8%	34.0%	3.5%	13.6%	11.8%	5.8%	2.1%	2.9%	3.4%	3.0%	3.0%
33	Urumqi	3.1%	6.4%	10.6%	9.1%	10.3%	11.4%	9.3%	10.2%	4.4%	4.3%	0.5%	2.0%	2.3%	2.3%
34	Shenzhen	5.1%	10.8%	10.3%	10.2%	17.1%	4.0%	29.0%	4.6%	5.8%	1.9%	0.1%	1.1%	1.2%	1.2%
35	Xining	-0.2%	-3.8%	11.5%	15.8%	16.3%	14.7%	34.6%	13.7%	0.6%	2.1%	-0.3%	0.8%	1.0%	1.0%

Appendix E: 35 Chinese Cities Registered Population Historical and Forecast (in Mil) - 2012F Ranking

	City	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008F	2009F	2010F	2011F	2012F
1	Chongqing*	9.8	30.4	30.6	30.7	30.9	31.0	31.1	31.3	31.4	31.7	32.0	32.4	32.6	32.9	33.2	33.5	33.8
2	Shanghai	13.0	13.1	13.1	13.1	13.2	13.3	13.3	13.4	13.5	13.6	13.7	13.8	13.9	14.0	14.1	14.2	14.3
3	Beijing	10.8	12.2	12.2	12.5	11.1	11.2	11.4	11.5	11.6	11.8	12.0	12.1	12.3	12.5	12.6	12.8	12.9
4	Chengdu	15.3	9.9	10.0	10.0	10.1	10.2	10.3	10.4	10.6	10.8	11.0	11.1	11.2	11.4	11.5	11.6	11.7
5	Harbin	9.1	9.1	9.2	9.3	9.3	9.4	9.5	9.5	9.7	9.7	9.8	9.9	9.9	10.0	10.1	10.2	10.2
6	Shijiazhuang	8.5	8.6	8.7	8.8	8.9	9.0	9.0	9.1	9.2	9.3	9.4	9.6	9.7	9.8	9.9	10.1	10.2
7	Tianjin	9.0	9.0	9.1	9.1	9.1	9.1	9.2	9.3	9.3	9.4	9.5	9.6	9.7	9.8	9.9	9.9	10.0
8	Wuhan	7.2	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.2	8.3	8.4	8.5	8.6	8.7	8.8
9	Guangzhou	6.6	6.7	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.9	8.0	8.2	8.3	8.4
10	Xian	6.5	6.6	6.7	6.7	6.9	6.9	7.0	7.2	7.3	7.4	7.5	7.6	7.8	7.9	8.0	8.1	8.2
11	Qingdao	6.9	7.0	7.0	7.0	7.1	7.1	7.2	7.2	7.3	7.4	7.5	7.6	7.7	7.7	7.8	7.9	8.0
12	Changchun	6.8	6.8	6.9	6.9	7.0	7.1	7.1	7.2	7.2	7.3	7.4	7.5	7.5	7.6	7.7	7.7	7.8
13	Zhengzhou	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.1	7.2	7.3	7.5	7.6	7.8
14	Nanning	2.8	2.8	2.8	2.9	6.3	6.3	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.3	7.4
15	Shenyang	6.7	6.7	6.7	6.8	6.9	6.9	6.9	6.9	6.9	7.0	7.0	7.1	7.1	7.2	7.2	7.3	7.3
16	Hangzhou	6.0	6.1	6.1	6.2	6.2	6.3	6.4	6.4	6.5	6.6	6.7	6.7	6.8	6.9	6.9	7.0	7.1
17	Changsha	5.7	5.7	5.8	5.8	5.9	5.9	6.0	6.0	6.1	6.2	6.3	6.4	6.4	6.5	6.6	6.7	6.7
18	Nanjing	5.3	5.3	5.3	5.4	5.4	5.5	5.6	5.7	5.8	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7
19	Fuzhou	5.7	5.7	5.8	5.8	5.9	5.9	6.0	6.0	6.1	6.1	6.2	6.3	6.4	6.4	6.5	6.6	6.7
20	Jinan	5.4	5.5	5.5	5.6	5.6	5.7	5.8	5.8	5.9	6.0	6.0	6.0	6.1	6.1	6.2	6.2	6.2
21	Dalian	5.4	5.4	5.4	5.5	5.5	5.5	5.6	5.6	5.6	5.7	5.7	5.8	5.8	5.9	5.9	6.0	6.0
22	Ningbo	5.3	5.3	5.4	5.4	5.4	5.4	5.5	5.5	5.5	5.6	5.6	5.6	5.7	5.7	5.8	5.8	5.8
23	Kunming	3.8	3.8	3.9	4.7	4.8	4.9	4.9	5.0	5.0	5.1	5.1	5.2	5.2	5.3	5.3	5.4	5.4
24	Nanchang	4.0	4.1	4.2	4.2	4.3	4.4	4.5	4.5	4.6	4.8	4.8	4.9	5.0	5.1	5.2	5.3	5.3
25	Hefei	4.2	4.2	4.3	4.3	4.4	4.4	4.5	4.6	4.4	4.6	4.7	4.8	4.9	4.9	5.0	5.1	5.2
26	Taiyuan	2.9	2.9	3.0	3.0	3.1	3.2	3.2	3.3	3.3	3.4	3.5	3.6	3.6	3.7	3.8	3.8	3.9
27	Guiyan	3.1	3.1	3.2	3.2	3.3	3.4	3.4	3.4	3.5	3.5	3.5	3.6	3.6	3.7	3.7	3.8	3.8
28	Urumqi	1.5	1.5	1.5	1.6	1.6	1.7	1.8	1.8	1.9	1.9	2.0	2.3	2.5	2.8	3.1	3.4	3.7
29	Lanzhou	2.8	2.8	2.8	2.9	2.9	3.0	3.0	3.0	3.1	3.1	3.1	3.2	3.2	3.3	3.3	3.4	3.5
30	Xining	1.1	1.1	1.2	1.3	1.7	1.8	1.8	1.8	1.8	1.8	1.9	2.2	2.4	2.6	2.8	3.1	3.3
31	Shenzhen*	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.5	2.7	2.9	3.1
32	Hohhot	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.4
33	Xiamen	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	1.9	2.0
34	Yinchuan	0.9	0.9	0.9	1.0	1.0	1.0	1.3	1.3	1.4	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.8
35	Haikou	0.5	0.5	0.5	0.5	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7

Source: Historical data provided by realestate.cei.gov.cn

Appendix F: 35 Chinese Cities Registered Population Growth Historical and Forecast - 2012F Ranking

	City	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008F	2009F	2010F	2011F	2012F
1	Urumqi	2.7%	1.9%	2.6%	3.4%	2.8%	4.0%	3.3%	2.4%	4.4%	4.0%	14.6%	9.8%	9.8%	9.8%	9.8%	9.8%
2	Xining	1.0%	11.4%	8.0%	30.3%	1.1%	1.1%	1.5%	1.3%	-0.8%	2.7%	15.3%	9.2%	9.2%	9.2%	9.2%	9.2%
3	Shenzhen	5.9%	4.7%	4.6%	4.2%	5.7%	5.6%	8.2%	9.4%	10.2%	8.2%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%
4	Yinchuan	2.0%	1.6%	1.1%	5.8%	2.9%	28.0%	0.0%	3.6%	2.0%	2.9%	2.8%	4.3%	4.3%	4.3%	4.3%	4.3%
5	Xiamen	1.4%	1.5%	1.9%	1.8%	2.4%	2.1%	3.4%	3.5%	4.4%	4.7%	4.3%	3.9%	3.9%	3.9%	3.9%	3.9%
6	Haikou	3.0%	2.7%	3.0%	132.1%	2.7%	3.5%	3.7%	2.8%	3.0%	2.4%	1.4%	2.1%	2.1%	2.1%	2.1%	2.1%
7	Taiyuan	2.0%	0.8%	1.4%	2.9%	2.1%	2.2%	1.6%	1.4%	2.5%	2.5%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%
8	Zhengzhou	1.3%	1.5%	1.5%	2.1%	1.7%	1.1%	2.3%	1.5%	1.3%	1.8%	2.2%	1.9%	1.9%	1.9%	1.9%	1.9%
9	Guangzhou	1.6%	1.1%	1.6%	2.3%	1.7%	1.1%	0.6%	1.7%	1.7%	0.9%	2.1%	1.8%	1.8%	1.8%	1.8%	1.8%
10	Nanjing	0.8%	0.5%	1.0%	1.4%	1.5%	1.9%	1.6%	2.0%	2.1%	1.9%	1.6%	1.7%	1.7%	1.7%	1.7%	1.7%
11	Nanchang	1.5%	1.9%	2.0%	2.0%	1.8%	2.0%	0.4%	2.2%	3.1%	1.8%	1.5%	1.7%	1.7%	1.7%	1.7%	1.7%
12	Hefei	1.4%	0.9%	0.9%	1.9%	0.9%	1.3%	1.9%	-2.6%	2.5%	3.1%	1.9%	1.6%	1.6%	1.6%	1.6%	1.6%
13	Lanzhou	1.6%	1.2%	1.3%	1.1%	2.0%	1.5%	1.1%	1.2%	1.2%	0.6%	1.8%	1.6%	1.6%	1.6%	1.6%	1.6%
14	Hohhot	1.5%	2.0%	1.7%	0.7%	1.3%	0.8%	0.2%	0.4%	-0.6%	1.1%	2.3%	1.6%	1.6%	1.6%	1.6%	1.6%
15	Nanning	1.2%	1.2%	0.4%	118.7%	0.7%	0.7%	1.1%	1.1%	1.6%	1.9%	1.7%	1.5%	1.5%	1.5%	1.5%	1.5%
16	Xian	1.1%	0.9%	0.9%	2.0%	1.0%	1.1%	2.0%	1.2%	2.3%	1.6%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
17	Shijiazhuang	0.7%	0.8%	0.9%	1.6%	0.7%	0.9%	0.7%	0.8%	1.1%	1.3%	1.7%	1.3%	1.3%	1.3%	1.3%	1.3%
18	Guiyan	0.4%	1.4%	1.8%	3.1%	1.3%	1.4%	1.3%	0.9%	0.8%	1.1%	1.5%	1.3%	1.3%	1.3%	1.3%	1.3%
19	Beijing	12.9%	0.5%	2.2%	-11.4%	1.3%	1.2%	1.1%	1.2%	1.5%	1.4%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
20	Wuhan	1.1%	1.1%	1.1%	1.2%	1.2%	1.3%	1.7%	0.6%	2.0%	2.2%	1.1%	1.3%	1.3%	1.3%	1.3%	1.3%
21	Changsha	0.8%	0.9%	1.0%	0.6%	0.2%	1.4%	1.1%	1.4%	1.7%	1.6%	1.0%	1.1%	1.1%	1.1%	1.1%	1.1%
22	Fuzhou	0.9%	0.9%	0.6%	1.0%	0.8%	0.6%	1.2%	0.7%	0.9%	1.3%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%
23	Qingdao	0.7%	0.6%	0.5%	0.5%	0.5%	0.7%	0.7%	1.4%	1.3%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
24	Chengdu	-35.3%	0.8%	0.7%	1.0%	0.6%	0.8%	1.5%	1.5%	2.1%	2.0%	0.8%	1.1%	1.1%	1.1%	1.1%	1.1%
25	Hangzhou	0.8%	0.6%	0.7%	0.9%	1.2%	1.2%	0.9%	1.4%	1.3%	0.9%	0.9%	1.0%	1.0%	1.0%	1.0%	1.0%
26	Changchun	1.0%	0.5%	0.6%	1.2%	0.9%	1.0%	0.8%	0.8%	1.0%	1.1%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
27	Tianjin	0.2%	0.6%	0.6%	0.2%	0.2%	0.6%	0.8%	0.7%	0.7%	1.0%	1.1%	0.9%	0.9%	0.9%	0.9%	0.9%
28	Chongqing	210.3%	0.6%	0.4%	0.6%	0.2%	0.5%	0.5%	0.5%	0.8%	0.9%	1.1%	0.9%	0.9%	0.9%	0.9%	0.9%
29	Dalian	0.6%	0.5%	0.4%	1.1%	0.6%	0.6%	0.4%	0.2%	0.7%	1.2%	1.1%	0.9%	0.9%	0.9%	0.9%	0.9%
30	Kunming	1.2%	1.5%	21.5%	1.6%	1.4%	1.5%	1.2%	0.4%	1.1%	1.1%	0.7%	0.9%	0.9%	0.9%	0.9%	0.9%
31	Harbin	0.7%	0.8%	0.6%	0.8%	0.7%	0.8%	0.6%	1.7%	0.5%	0.6%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
32	Shanghai	0.1%	0.1%	0.5%	0.6%	0.4%	0.5%	0.6%	0.8%	0.6%	0.6%	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%
33	Shenyang	0.4%	0.2%	0.3%	1.2%	0.6%	-0.1%	0.0%	0.7%	0.7%	0.7%	0.9%	0.7%	0.7%	0.7%	0.7%	0.7%
34	Ningbo	0.6%	0.4%	0.6%	0.5%	0.4%	0.5%	0.5%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
35	Jinan	1.1%	0.8%	0.7%	0.9%	1.1%	1.1%	1.3%	1.3%	1.2%	1.0%	0.2%	0.6%	0.6%	0.6%	0.6%	0.6%

Appendix G: 35 Chinese Cities Historical Nominal Average Sales Price (in RMB psm) - 2007 Ranking

	City	1999	2000	2001	2002	2003	2004	2005	2006	2007
1	Shenzhen	5,004	5,275	5,507	5,267	5,793	6,385	6,996	8,848	13,370
2	Beijing	4,787	4,557	4,716	4,467	4,456	4,747	6,162	7,375	10,661
3	Xiamen	2,826	2,505	2,559	2,595	3,077	3,768	4,744	6,601	8,907
4	Guangzhou	3,946	3,978	4,047	3,995	3,999	4,356	5,041	6,152	8,439
5	Shanghai	3,102	3,326	3,658	4,007	4,989	5,761	6,698	7,039	8,253
6	Hangzhou	2,685	2,733	2,624	3,197	3,657	3,884	5,454	5,967	7,432
7	Ningbo	1,813	1,781	1,864	2,357	2,541	3,026	4,517	5,105	6,097
8	Tianjin	2,157	2,274	2,308	2,414	2,393	2,950	3,987	4,649	5,576
9	Dalian	2,199	2,369	2,679	2,668	2,699	2,973	3,580	4,256	5,417
10	Qingdao	1,684	1,743	1,831	2,066	2,297	2,748	3,594	4,001	5,105
11	Nanjing	2,808	2,598	2,577	2,780	2,888	3,098	3,850	4,270	5,011
12	Fuzhou	1,773	1,850	2,002	1,960	2,178	2,463	2,981	3,976	4,900
13	Wuhan	1,722	1,636	1,745	1,916	2,023	2,463	2,986	3,535	4,516
14	Chengdu	1,615	1,608	1,648	1,775	1,908	2,224	2,870	3,499	4,198
15	Jinan	1,685	1,800	1,858	2,068	2,307	2,831	2,993	3,319	3,720
16	Taiyuan	1,302	1,367	1,975	1,899	2,204	2,333	2,903	3,156	3,561
17	Shenyang	2,437	2,549	2,605	2,601	2,753	2,852	3,027	3,184	3,536
18	Nanchang	1,168	1,298	1,491	1,632	2,079	2,429	2,519	3,053	3,509
19	Haikou	1,688	1,982	1,946	2,049	1,989	2,215	2,529	2,673	3,403
20	Zhengzhou	1,467	1,891	1,880	1,914	1,955	2,004	2,387	2,691	3,328
21	Nanning	1,582	1,855	2,035	2,154	2,169	2,482	2,388	2,656	3,273
22	Xian	1,135	1,451	1,849	1,930	1,921	2,394	2,686	3,073	3,215
23	Changsha	1,567	1,796	1,736	1,649	1,786	1,775	2,089	2,431	3,191
24	Hefei	1,667	1,499	1,522	1,618	1,889	2,271	2,799	2,874	3,154
25	Changchun	1,818	1,725	2,196	2,064	1,973	2,119	2,272	2,408	3,118
26	Kunming	1,790	1,985	2,333	2,127	2,131	2,437	2,513	2,733	2,994
27	Harbin	1,783	2,033	2,127	2,157	2,183	2,215	2,384	2,503	2,943
28	Lanzhou	1,533	1,558	1,601	1,481	1,673	2,084	2,339	2,515	2,920
29	Guiyan	1,429	1,406	1,355	1,471	1,735	1,643	1,801	2,138	2,619
30	Chongqing	1,080	1,077	1,133	1,277	1,324	1,573	1,901	2,081	2,588
31	Urumqi	1,609	1,627	1,771	1,828	1,864	1,797	1,920	2,021	2,528
32	Hohhot	1,188	1,187	1,330	1,202	1,277	1,430	1,541	2,176	2,459
33	Shijiazhuang	1,917	1,685	1,907	1,555	1,570	1,534	1,705	2,005	2,378
34	Xining	1,262	1,289	1,263	1,302	1,499	1,536	1,727	1,940	2,313
35	Yinchuan	1,342	1,345	1,540	1,889	1,728	1,923	2,030	2,185	2,230

Source: Realestate.cei.gov.cn

Appendix H1: 14 Chinese Cities Historical Nominal Average Sales Price (in RMB psm) – By Month

Month	City						
	Shenzhen	Guangzhou	Dongguan	Foshan	Shanghai	Wuxi	Suzhou
2006.01	7,942	5,564	2,609	3,518	9,714	4,540	5,206
2006.02	8,190	5,985	3,432	3,528	9,647	4,855	4,872
2006.03	8,346	5,997	3,191	3,606	9,856	4,539	5,142
2006.04	7,987	6,253	3,794	3,277	9,550	4,458	5,132
2006.05	9,575	6,097	2,791	3,559	9,586	4,372	5,399
2006.06	9,836	6,380	2,818	3,850	10,620	4,430	5,495
2006.07	10,227	6,848	4,488	3,888	10,092	4,598	5,023
2006.08	10,786	6,788	2,984	3,918	9,147	4,933	4,979
2006.09	9,359	6,382	3,338	3,816	9,495	4,849	5,284
2006.10	9,408	6,384	3,308	3,932	9,166	4,732	5,012
2006.11	9,677	6,633	3,156	4,220	10,259	4,704	5,334
2006.12	10,350	7,189	3,415	4,066	9,792	4,064	5,248
2007.01	10,873	7,140	5,308	3,862	9,528	4,784	5,130
2007.02	11,252	7,729	5,813	3,996	9,736	4,375	5,369
2007.03	12,664	7,029	5,049	4,185	9,282	3,975	4,911
2007.04	11,207	7,581	5,633	4,229	10,076	4,641	5,690
2007.05	14,546	7,823	6,054	4,244	10,369	5,040	5,853
2007.06	14,178	7,896	5,358	4,530	10,520	5,070	6,436
2007.07	14,389	8,490	6,141	4,776	10,441	5,102	6,794
2007.08	15,414	8,849	6,319	5,145	10,672	4,978	6,964
2007.09	16,719	9,686	7,069	5,972	10,586	4,993	7,434
2007.10	17,294	11,574	7,871	5,655	11,421	5,167	7,415
2007.11	15,410	10,433	7,570	6,822	10,657	5,054	6,806
2007.12	15,626	10,586	6,841	5,471	11,798	5,603	7,047
2008.01	14,886	9,766	6,468	5,646	11,346	5,979	6,629
2008.02	14,807	9,302	6,057	5,314	11,392	5,537	5,753
2008.03	12,463	9,316	5,763	5,732	13,117	5,459	6,832
2008.04	11,927	10,997	6,174	5,208	14,831	5,895	7,580
2008.05	11,143	10,529	6,117	5,524	13,874	5,630	7,024
2008.06	14,574	9,569	6,573	5,908	17,557	6,590	5,946
2008.07	15,565	9,122	6,775	5,647	13,412	6,300	6,605
2008.08	14,341	9,078	6,971	5,578	13,749	5,848	6,584
2008.09	14,671	8,244	5,643	5,592	13,298	5,924	6,427
2008.10	12,978	9,732	5,102	5,400	11,582	5,402	6,697
2008.11	12,396	9,394	5,740	5,094	13,956	5,825	6,698
2008.12	12,407	8,012	5,621	5,143	11,861	6,356	7,231
2009.01	11,423	8,014	6,019	5,336	13,493	5,378	6,108
2009.02	12,131	8,020	5,300	5,385	12,059	5,567	6,610
2009.03	11,123	8,288	5,454	5,192	12,983	5,529	6,152
2009.04	12,381	7,978	5,658	5,446	13,480	5,779	6,558
2009.05	12,441	8,300	5,867	5,522	13,589	5,969	6,737

Source: Housing Management Bureau

Appendix H2: 14 Chinese Cities Historical Nominal Average Sales Price (in RMB psm) – By Month

Month	City						
	Hangzhou	Nanjing	Beijing	Tianjin	Shenyang	Chengdu	Wuhan
2006.01	9,967	4,249	7,361	4,761	3,180	3,912	3,392
2006.02	9,800	4,202	7,268	4,784	3,090	3,932	3,283
2006.03	11,025	4,504	7,563	4,863	3,004	4,001	3,335
2006.04	9,305	4,421	7,691	4,931	3,177	4,058	3,347
2006.05	8,982	4,628	7,924	5,081	3,164	4,167	3,465
2006.06	8,918	4,644	8,126	4,749	3,308	4,392	3,596
2006.07	10,113	4,755	8,350	4,486	3,175	4,339	3,457
2006.08	9,738	4,391	8,106	4,664	3,232	4,336	3,614
2006.09	9,228	4,544	8,082	4,940	3,264	4,336	3,777
2006.10	8,808	4,574	8,358	4,809	3,276	4,541	3,772
2006.11	9,037	4,549	8,886	5,135	3,297	4,378	4,008
2006.12	8,734	4,712	9,227	4,974	3,384	4,343	4,021
2007.01	8,919	4,669	8,867	5,120	3,217	4,425	4,374
2007.02	8,774	4,779	9,179	5,287	3,259	4,719	4,389
2007.03	9,130	4,777	9,786	5,395	3,065	4,785	4,251
2007.04	8,798	5,218	10,184	5,406	3,388	4,641	4,409
2007.05	8,645	5,310	10,127	5,737	3,220	4,858	4,760
2007.06	8,969	5,384	11,076	6,094	3,484	5,146	4,820
2007.07	8,996	5,488	11,148	6,232	3,248	5,265	5,046
2007.08	9,113	5,975	12,453	6,187	3,423	5,344	5,147
2007.09	9,377	6,309	13,757	6,248	3,436	5,918	5,399
2007.10	12,157	6,031	13,727	6,564	3,458	5,999	5,967
2007.11	12,032	6,833	13,728	6,614	3,455	5,868	6,066
2007.12	15,007	6,697	13,738	7,027	3,479	6,223	6,054
2008.01	12,961	5,306	12,256	6,876	3,339	6,099	5,736
2008.02	12,373	6,378	13,731	7,733	3,406	5,732	5,611
2008.03	11,946	5,674	13,907	6,896	3,345	5,713	5,694
2008.04	12,876	6,887	13,946	7,035	3,483	5,612	5,674
2008.05	11,606	6,784	13,240	7,564	3,532	5,485	6,861
2008.06	14,159	6,716	12,674	6,870	3,384	5,061	6,110
2008.07	13,904	6,947	13,769	6,550	3,321	5,664	5,383
2008.08	17,258	6,605	14,070	6,895	3,293	6,012	5,295
2008.09	19,614	6,526	12,647	6,680	3,508	5,795	5,516
2008.10	15,204	5,802	12,214	6,550	3,512	5,553	5,182
2008.11	15,986	6,248	12,438	6,645	3,474	5,329	5,059
2008.12	12,977	5,956	11,910	6,736	3,471	5,365	4,736
2009.01	13,289	6,395	10,486	6,600	3,301	5,370	5,011
2009.02	12,591	5,757	11,441	7,161	3,300	5,200	5,056
2009.03	11,335	6,508	11,773	6,484	3,875	5,412	5,566
2009.04	12,782	6,313	12,308	6,426	3,825	5,472	5,383
2009.05	12,837	6,819	13,024	6,923	3,900	5,759	5,223

Source: Housing Management Bureau

Appendix I1: 14 Chinese Cities Historical Sales Volume (in 10K sqm) – By Month

Month	City						
	Shenzhen	Guangzhou	Dongguan	Foshan	Shanghai	Wuxi	Suzhou
2006.01	75	85	16	56	68	11	20
2006.02	33	70	7	51	60	8	17
2006.03	70	88	23	72	143	18	37
2006.04	64	93	26	68	202	26	56
2006.05	73	56	23	70	214	32	64
2006.06	55	107	26	89	137	30	43
2006.07	31	64	21	63	118	18	45
2006.08	38	65	35	59	117	20	61
2006.09	51	66	21	56	145	20	44
2006.10	50	58	26	54	127	30	48
2006.11	81	98	31	85	132	34	58
2006.12	81	63	33	74	140	51	72
2007.01	80	75	57	62	138	30	43
2007.02	60	76	16	58	80	18	27
2007.03	37	60	43	55	153	37	57
2007.04	53	71	41	77	171	38	51
2007.05	49	59	68	64	236	34	80
2007.06	56	87	67	77	266	41	68
2007.07	49	76	71	73	215	36	72
2007.08	34	69	56	71	206	38	74
2007.09	30	70	60	74	216	52	88
2007.10	15	58	41	60	167	59	46
2007.11	18	58	41	60	119	58	63
2007.12	19	43	52	45	99	43	43
2008.01	27	35	25	48	82	32	37
2008.02	7	23	9	21	33	9	17
2008.03	34	38	29	33	93	21	20
2008.04	26	40	27	40	96	20	29
2008.05	38	39	41	41	92	27	39
2008.06	29	67	25	42	100	28	35
2008.07	22	61	31	47	69	25	27
2008.08	35	61	38	40	64	19	32
2008.09	26	51	24	38	48	22	20
2008.10	37	63	30	43	62	24	24
2008.11	56	54	34	51	70	27	31
2008.12	78	49	42	52	86	39	41
2009.01	35	46	26	66	51	25	20
2009.02	51	50	33	71	76	29	53
2009.03	77	64	57	85	152	48	51
2009.04	75	83	58	104	188	52	63
2009.05	75	90	63	62	211	60	99

Source: Housing Management Bureau

Appendix I2: 14 Chinese Cities Historical Sales Volume (in 10K sqm) – By Month

Month	City						
	Hangzhou	Nanjing	Beijing	Tianjin	Shenyang	Chengdu	Wuhan
2006.01	16	60	105	78	21	70	50
2006.02	10	28	104	42	24	39	38
2006.03	16	57	185	70	62	65	82
2006.04	36	75	208	82	198	68	76
2006.05	50	93	176	92	65	63	93
2006.06	36	96	168	90	56	64	82
2006.07	17	53	148	78	68	70	68
2006.08	18	54	149	74	67	67	70
2006.09	30	62	186	85	198	66	77
2006.10	47	84	156	82	80	70	95
2006.11	40	113	170	89	110	101	90
2006.12	42	95	164	86	33	120	93
2007.01	35	82	140	79	80	102	75
2007.02	19	51	69	43	41	47	31
2007.03	39	52	123	52	37	74	69
2007.04	45	86	153	79	163	87	76
2007.05	80	96	142	83	63	77	74
2007.06	109	115	170	88	98	108	101
2007.07	76	74	187	81	74	123	103
2007.08	82	72	178	134	95	134	106
2007.09	93	99	140	140	216	152	109
2007.10	64	83	114	103	95	97	99
2007.11	50	92	119	96	103	109	86
2007.12	57	91	94	80	90	73	52
2008.01	30	50	61	52	83	60	42
2008.02	23	17	25	25	35	30	13
2008.03	29	30	65	49	73	56	29
2008.04	33	45	56	54	105	65	22
2008.05	57	41	91	52	72	50	36
2008.06	24	55	99	56	82	52	32
2008.07	18	32	71	46	77	45	38
2008.08	13	23	41	31	72	39	31
2008.09	17	18	55	37	216	39	27
2008.10	13	20	53	42	82	38	45
2008.11	17	29	81	48	98	46	47
2008.12	19	61	79	44	79	62	72
2009.01	13	56	61	35	36	50	48
2009.02	17	44	83	48	36	77	64
2009.03	45	69	151	122	151	107	106
2009.04	64	87	190	128	78	103	89
2009.05	100	87	173	128	87	210	114

Source: Housing Management Bureau

Appendix J: Real Estate Fiscal Policies – By Month

Month	Nominal Prime Rate (%)	Y-o-Y CPI (%)	Second Home Down Payment Ratio (%)
2006.01	6.12	1.90	20.0
2006.02	6.12	0.90	20.0
2006.03	6.12	0.80	20.0
2006.04	6.15	1.20	20.0
2006.05	6.39	1.40	20.0
2006.06	6.39	1.50	20.0
2006.07	6.39	1.00	20.0
2006.08	6.58	1.30	20.0
2006.09	6.84	1.50	20.0
2006.10	6.84	1.40	20.0
2006.11	6.84	1.90	20.0
2006.12	6.84	2.80	20.0
2007.01	6.84	2.20	20.0
2007.02	6.84	2.70	20.0
2007.03	6.96	3.30	20.0
2007.04	7.11	3.00	20.0
2007.05	7.15	3.40	20.0
2007.06	7.20	4.40	20.0
2007.07	7.26	5.60	20.0
2007.08	7.44	6.50	20.0
2007.09	7.70	6.20	20.0
2007.10	7.83	6.50	40.0
2007.11	7.83	6.90	40.0
2007.12	7.83	6.50	40.0
2008.01	7.83	7.10	40.0
2008.02	7.83	8.70	40.0
2008.03	7.83	8.30	40.0
2008.04	7.83	8.50	40.0
2008.05	7.83	7.70	40.0
2008.06	7.83	7.10	40.0
2008.07	7.83	6.30	40.0
2008.08	7.83	4.90	40.0
2008.09	7.79	4.60	40.0
2008.10	7.52	4.00	40.0
2008.11	7.06	2.40	40.0
2008.12	6.07	1.20	40.0
2009.01	5.94	1.00	30.0
2009.02	5.94	-1.60	30.0
2009.03	5.94	-1.20	30.0
2009.04	5.94	-1.50	30.0
2009.05	5.94	-1.40	30.0

Sources: People's Bank of China, Realestate.cei.gov.cn

Appendix K – Average Sales Price Monthly Forecast (in RMB psm)

Month	Shenzhen	Guangzhou	Dongguan	Foshan	Shanghai	Wuxi	Suzhou	Hangzhou	Nanjing	Beijing	Tianjin	Shenyang	Chengdu	Wuhan
2009.03	12,634	8,061	5,415	4,857	11,641	5,637	6,541	12,059	5,627	11,580	6,195	3,302	5,033	4,671
2009.04	11,665	7,846	5,443	4,943	12,306	5,033	5,723	12,081	5,800	10,597	5,950	2,888	4,887	4,659
2009.05	12,416	7,924	5,883	5,141	11,804	5,711	6,742	11,876	5,640	11,382	6,571	3,075	5,288	5,241
2009.06	12,045	8,273	5,639	5,168	12,421	5,567	6,165	11,561	6,239	11,702	6,639	4,098	5,424	5,451
2009.07	12,783	8,226	5,838	5,392	12,773	5,748	6,460	12,453	6,106	12,120	6,535	3,348	5,424	5,321
2009.08	12,776	8,614	5,813	5,221	12,842	5,899	6,658	12,477	6,353	12,504	6,790	3,689	6,291	5,289
2009.09	12,591	8,386	5,742	5,157	12,202	5,569	6,250	11,725	6,111	11,747	6,626	4,014	5,452	5,359
2009.10	12,997	8,408	5,880	5,309	12,415	5,679	6,433	12,237	6,021	12,017	6,530	3,280	5,430	5,269
2009.11	12,966	8,705	5,799	5,116	12,447	5,776	6,578	12,237	6,134	12,209	6,654	3,595	6,210	5,273
2009.12	12,882	8,487	5,786	5,141	12,106	5,550	6,318	11,813	6,039	11,791	6,562	3,867	5,465	5,286
2010.01	13,071	8,491	5,844	5,207	12,200	5,585	6,397	12,068	5,955	11,925	6,465	3,300	5,415	5,201
2010.02	13,043	8,688	5,770	5,060	12,214	5,643	6,491	12,062	6,005	12,018	6,524	3,526	5,969	5,213
2010.03	13,006	8,530	5,775	5,100	12,037	5,503	6,336	11,830	5,972	11,794	6,474	3,714	5,442	5,208
2010.04	13,097	8,535	5,805	5,134	12,083	5,516	6,374	11,960	5,917	11,865	6,408	3,344	5,405	5,154
2010.05	13,077	8,655	5,752	5,036	12,089	5,550	6,431	11,955	5,938	11,910	6,435	3,488	5,758	5,164

Appendix L – SalesLEV Monthly Forecast

Month	Shenzhen	Guangzhou	Dongguan	Foshan	Shanghai	Wuxi	Suzhou	Hangzhou	Nanjing	Beijing	Tianjin	Shenyang	Chengdu	Wuhan
2009.03	1.37	1.19	1.31	1.20	1.13	1.25	1.16	1.03	1.11	1.05	1.08	1.33	1.19	1.26
2009.04	1.15	1.15	1.27	1.36	1.03	1.41	1.18	1.08	1.22	1.11	1.09	1.15	1.21	1.25
2009.05	1.52	1.21	2.25	1.54	1.40	2.06	2.01	1.30	1.44	1.35	1.42	1.35	1.77	1.88
2009.06	1.50	1.17	1.60	1.44	1.21	1.65	1.38	1.51	1.37	1.23	1.69	1.89	1.53	1.52
2009.07	1.40	1.23	1.59	1.43	1.18	1.60	1.35	1.46	1.25	1.25	1.51	0.96	1.39	1.40
2009.08	1.32	1.44	1.41	1.17	1.16	1.63	1.44	1.42	1.18	1.18	1.46	1.30	2.19	1.46
2009.09	1.38	1.20	1.48	1.34	1.21	1.52	1.36	1.42	1.29	1.20	1.46	1.54	1.44	1.38
2009.10	1.30	1.20	1.46	1.31	1.17	1.47	1.32	1.35	1.22	1.18	1.37	1.14	1.36	1.31
2009.11	1.26	1.28	1.38	1.20	1.15	1.48	1.35	1.34	1.19	1.14	1.34	1.28	1.68	1.34
2009.12	1.29	1.18	1.41	1.27	1.19	1.44	1.33	1.36	1.24	1.17	1.34	1.37	1.39	1.31
2010.01	1.25	1.19	1.40	1.26	1.18	1.43	1.31	1.32	1.22	1.16	1.31	1.23	1.36	1.29
2010.02	1.24	1.22	1.37	1.22	1.17	1.43	1.32	1.31	1.20	1.13	1.29	1.28	1.47	1.30
2010.03	1.26	1.18	1.39	1.25	1.20	1.42	1.32	1.33	1.23	1.16	1.30	1.31	1.37	1.28
2010.04	1.23	1.19	1.38	1.25	1.19	1.41	1.31	1.31	1.22	1.15	1.29	1.27	1.36	1.28
2010.05	1.23	1.19	1.37	1.24	1.18	1.41	1.31	1.31	1.22	1.14	1.28	1.28	1.39	1.28