

The Influence of Shanghai's Population Structure on City's Housing Demand and the Solution for Housing Supply

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Abstract

In a city like Shanghai, where one of the biggest and fastest growing of both the population and quantity of housing demand and supply in the world exists, the need to estimate the influence of population transition on housing demand becomes a vital task. This research presented the characteristics of Shanghai's population transition in future and then housing demand in future is forecasted; finally, the strategy to control the housing market is presented. The results revealed that the population characteristics, the housing demand and the control strategy has interaction relationship with each other: the population characteristics and trend such as population quantity and structure lay in five points, which decides the housing demand in six ways and then it will decide the six strategies needed to control the housing market in Shanghai; while the latter ones will adapt to the variation of the former ones.

Key words: Influence; Population transition; Housing demand and supply; Housing market; Shanghai

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INTRODUCTION

Shanghai is one of the biggest and most fast developing cities in the world today, it has a population of more than 2200 million in the end of 2010. Shanghai's population structure has undergone huge changes in the past twenty to thirty years, the problems such as the big percent of aging people, the disrupt increase of the residence population and the diversification and internationalization of population that Shanghai facing today never emerged before. The variation of population structure will influence the housing demand, then will affect the housing supply mode. One of the basic ideas to solve these housing problems caused by population is to get to know the basic principles of the housing demand from the perspective of the population structure variation based on the thoughts of "take people as the foremost", then adjust the existed housing supply policy to adapt to the real housing demand.

This research jointed with the Shanghai's housing market development, aims at solving the existed problems in Shanghai and the conclusions and countermeasure presented will provide good suggestions and references for the government, the real estate developer to provide suitable housing products to the people in Shanghai.

1. RESEARCH BACKGROUND

1) Why make research on the demand and supply mode of Housing from the population structure transition perspective?

On one hand, the development of real estate industry are influence by many factors, while the housing demand has always been the direct factor that decides the real estate, and the population scale, population structure are the basic and internal factors that decide the housing demand. On the other hand, the variation patterns of the social and economic are relatively difficult to grasp

among the many factors that work upon Shanghai's housing demand. Once the population variation trends are known, the internal housing demand trend will be made out. While providing supply based on the demand is the most effective way to control the real estate industry. In short, it's the basic and effective way to make research on the housing demand from the perspective of population structure transition.

2) Shanghai's population structure has changed a lot since the Reform and Opening-up, such as the following:

- More than 22,000,000 resident population;
- Aging;
- Low percent of youth;
- Small family size;

3) While the demand and supply mode of housing operated now has played great role but still has problems with it, such as high demand still exist while high price prevents many people from having their own house.

In conclusion, it is important to make research on the trends for the housing demand based on the characteristics and trends of the population transition, then provide strategies to optimize the demand and supply mode existed now, which can provide reference to the government to set policy in the real estate field and this may affect everyone's life.

2. CHARACTERISTICS OF POPULATION STRUCTURE TRANSITION TREND

A. Population Structure Trend Forecast Method

This research made research on the influence of the population structure to the housing demand. In part 2 and 3, the methods collected lots of data, including the housing demand and supply data in the past fifteen years, the population census data, made some questionnaires and surveys, and used the quantitative methods like statistical method, Empirical analysis, model construction to get the regular pattern of the population structure and quantity variation, forecast the trend of the population change and the influence of it on the housing demand.

The population data is from Shanghai population census in 2000, Shanghai population sample census in 2005 and Shanghai Statistical yearbook. All the population are calculated and forecasted on the residence population. Population migration model and fertility rate for women of childbearing age are considered. The historical migration quantity comes from the statistical data of Shanghai bureau of statistics and the migration quantity in future can be forecasted in two ways:

(1) Assume the upper limit of total amount of migration people is less than 150,000 in 2050

$$Y = 2.2596 \log(t - 1994) + 5.1686$$

(2) Assume the upper limit of total amount of migration people is less than 170,000 in 2050

$$Y = 5.6019(t - 1994)^{0.2625}$$

Here, Y is the total amount of migration people, t is the year (assume first year is 1995).

Using the international widely accepted Songjian's Population model, a double-linear open and dynamic population model is constructed considering Shanghai is an open city. According to the previous two migration ways, the residence population, household population, the ratio of the household population to the residence population is forecasted. Also the ageing index and low fertility index has been calculated.

B. Forecast Results

The following conclusions can be got from the calculation results.

1) The household population will peak around 2025, and will decrease gradually. From a long-term point of view, the decrease of total amount of household population is inevitable.

2) The residence population will keep on increasing, inside which the household population will increase then decrease, the non-household population will keep on increasing. That means, the increase of Shanghai's population mainly comes from the immigrated people from outside areas.

3) The problem of "aging" and "lower percent of youth" will exist at the same time. On one side, the aging index in Shanghai will become larger and larger, and the aging trend will become more and more clear, which is rare in the world. The aging speed will become slower. On the other hand, the percent of youth in Shanghai's population is very low and the trend of "lower percent of youth" is much stronger than "aging". The "lower percent of youth" of Shanghai even goes forward the whole world. The problem of "lower percent of youth" may have more serious influence on Shanghai's sustainable development development.

3. FORECASTING FAMILY STRUCTURE TREND IN FUTURE

A. Variation Characteristics

1) **The Variation of Average Family Scale of Shanghai**
Shanghai family scale in 1978 is 3.8 persons, while in 2009 is 2.7 and the trend is keeping on decreasing, shown in Figure 1. It can be seen that average family scale of Shanghai has become smaller and smaller.

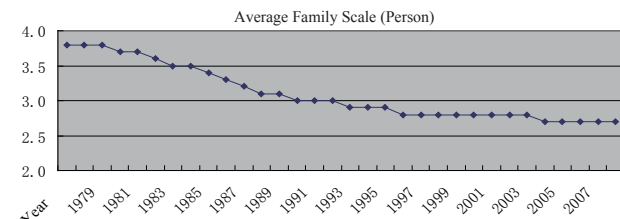


Figure 1
The Variation of Family Scale of Shanghai from 1978-2009

2) The Variation of Family Structure of Shanghai

The family structure has the characteristics of the percent of small family of few person and simple Intergenerational relations will increase in the future. The core and small family has become the main trend.

B. Influence of Family Scale Variation to the Housing Need

Grey system of GM(1,1) model is used in this paper to forecast the quantity of family structure in future and housing need. The following conclusions are reached: the trend of family scale variation in future in Shanghai must influence the housing need. More and more small-scale families appear, which means the housing should mainly be small units in future. The housing need of single and one couple family can not be ignored, and the core family should be paid the most attention.

Table 1
The Location Characteristics of Residential Population of Shanghai (PC: 10 thousand)

Area	Population quantity of each area		Percent to the total population (%)		Quantity variation (2000-2009)	Variation percent (%) (2000-2009)
	2000	2009	2000	2009		
Core urban	206.94	182.06	12.61	9.48	-24.88	-12.02
Edge of core urban	486.09	470.91	29.63	24.51	15.18	3.12
Near suburb	638.58	847.57	38.92	44.11	208.99	32.73
Far suburb	309.16	420.78	18.84	21.90	111.62	36.10

Calculated by data from *Shanghai Statistical Yearbook* 1991.1999.2009

B. Population Space Distribution Forecast

The grey theory is used in this research to forecast the population space distribution in future. The result is that after 2010 Shanghai Exposition, the near suburb will still be the area that most people will gather, while population gathering to the faraway suburb will be a new trend in future.

Along with the population distribution, the space location of resident housings also has the characteristics of suburbanization. It can be seen that the focus of residence house has transferred from the central urban to near suburb from the several perspectives of development residential area, the total residential area and the increase speed. The suburbanization situation has come into being quietly, shown in Table 2.

4. FORECASTING SPACE DISTRIBUTION STRUCTURE OF POPULATION TREND IN FUTURE

A. Space Distribution Structure of Population

1) The Basic Characteristics of Population Distribution

The population quantity decrease from the central urban to the outside suburb in Shanghai, that means, the central urban has the largest population quantity, then the near suburb has less population, the faraway suburb has the least population. The population density has the similar regular pattern with the population quantity.

2) The Adjustment and Optimization of Shanghai Population Space Distribution

In the previous years Shanghai has adopted a lot of positive policies to promote the population transfer from the central urban to the suburb and has got some effect. The density in core area has decreased while the density outside the core area increased including the area between the inner ring and middle ring, the middle ring and outer ring, the population density of the suburb has also increased, shown in Table 1. The over congested situations has been partially solved but will still continue for a long time. In additional, the population scattered along the train transportation, and gathered the suburb new city. Both "urbanization" and "Suburbanization" exist at the same time. The space distribution of population will keep on adjusting and optimization in future.

Table 2
The Buildings Area Distribution in the Four Areas in the Previous 10 years (PC: 10 thousand M2)

Area	1999		2009		Variation percent
	Area	Percent	Area	Percent	
Core urban	3215	16.36%	4501	8.97%	-7.30%
Edge of core urban	8354	42.53%	12871	25.68%	-18.85%
Near suburb	6898	35.12%	22224	44.34%	9.22%
Far suburb	1177	6%	10530	21.01%	15.01%

Calculated by data from *Shanghai Statistical Yearbook* 1991.1999.2009

On the other side, the new built commercial residential buildings tend to locate near the rail traffic since 2000, especially in the near suburb. Statistics shows that in the rank first ten sale list of the new built residential buildings

in 2008 and 2009, there are ten of them locate around the rail traffic. It can be seen that the locations of the residential buildings are greatly influenced by the rail traffic. the High Level Talent Persons will Increase because of the Globalization and the “Four Centers Construction” of Shanghai.

Shanghai has brought up the aim of “four centers construction” to improve its international competitive abilities. One of the most important factors to ensure the globalization and “four centers construction” is good population quality. More and more high quality persons will gather to Shanghai and which will cause the need for high quality residential housing.

5. STRATEGIES TO OPTIMIZE THE SUPPLY HOUSING MODE

To face the population variation trend in future, the housing supply mode should be optimized to adapt to the housing demand. The measures such as the policy guidance, market direction should be adopted to adjust and optimize the existed housing system, housing type, layout design to reach the aim of the balance of the total housing supply quantity and supply structure, the comparative steady supply system and price, and at the end the supply system is expected to satisfy the residence housing demand and can improve the overall housing living level.

A. Adjustment and Optimization of the “Two Systems of Commodity Housing and Indemnificatory Housing” Existed Now According to the Population Quantity and Structure Transition

1) Adjust the Products System, Explore the Mechanism of “Merging Four Indemnification Products in One System”, Broaden the Source of the Indemnification Money

- Adopt different policies to different kinds of indemnification products such as developing the low rent housing energetically, accelerating the development of the public rental housing and weakening development of the economic application of the housing.
- Culture appropriate environment and conditions of different kinds of indemnification products, construct the dynamic adjustment mechanisms of the “four indemnification products in one” mode, construct the management mechanism and implementation plan of coordinative use of indemnification products and design the detailed every day operation thoughts and mechanism of different kinds of indemnification housing products.
- Broaden the money source of indemnification housing to urge the successful proceeding of

the indemnification housing, which includes, to improve the policy support environment; increase the percent of the put the money of land transferring to support the indemnification construction; explore the investment mechanism and strengthen the money supervision and management.

2) Maintain the Continuity and Integrity of the Adjustment Policy to Solid the Achievements of the Commodity Housing Market

- Keep on carrying out the existed adjustment policy and pay attention to the mid to long term system construction.
- Create the investment way and lead the money to flow appropriately and decrease the opportunistic behaviors in the real estate industry.
- Improve the volume of land, increase the land supply quantity and promote the supply-demand balance of the market.

3) Clarify the Demarcation Line Between the Market and Indemnificatory Housing and Keep Them Develop Interactively and Harmoniously

- Shanghai is proceeding on the indemnification stage now, but the direction of the marketing of commodity housing should be stick to.
- Clarify the demarcation line between the two system, confirm the government responsibility and behavior limit and let the market play its role fully. The government should lead the market to develop healthily at the same time of strengthen the basic function of the indemnification housing.
- The government should play the main role in the indemnification housing and should decrease the interference of the market and avoid overdraw of the market's account.
- Besides the housing distribution mode in the indemnification system, other modes like currency compensation should be adopted to avoid the harm to the market by the indemnification system.

B. Control the Total Quantity of the Housing Development, Lead the Healthy Development of the Selling and Rental Market of Second-Hand House, Active and Consume the Stock Housing

1) Construct the New Management Mechanism that Suits the Trading Market of the Second-Hand House

- Clarify the existed policy that are not conducive to the second hand house and set up new policy that suit the development of the second hand house and perfect the business transactions, management, assessment and taxation system.
- It's important responsibility of the government to Perfect the information system and statistical mechanism for the third level market of the real estate industry, which is urgent in the market now.
- Standardize the intermediary industry for the

second hand house.

- Improve the service standard and quality of the evaluation industry of the real estate and decrease the false evaluation.

2) Cultivate Second Hand Rental Market to Be in Good Operation

- Set up taxation preferential policy in the rental market, including guide mechanism in taxation preferential policy and the stimulus policy to encourage the enterprise and organization to invest in rental market.
- Guide the residential people to consume the house appropriately and adjust the housing structure of consumption and investment.
- Develop the capital market to support the monetary and fiscal resource for the housing rental market.
- Rectify the rental regulations and policies, protect the tenants' benefits

C. Adjust the Housing Supply Mode for the Aging People According to the Variations of the Pension System

The old people are now taken care of in two ways, the family way and the social way. In the short period, perfect the family support for the elderly is still the main demand and the practical way to solve the aging problem in Shanghai, the reconstruction of the house to adapt to the elder people's living and the house for both "the elder and the younger" is suitable for the reality of Shanghai; in the long period, as the "one child" policy and the aging people population become larger, the house built for the aging people, nursing home and home for the Aged are necessary in the long period.

Developing a certain percent of the house for the aging people in the indemnificatory housing now is a good way to solve the problem.

In the social way, the construction of the new type of aging house, the following need to accomplish:

- The regulation should be set up and the policy system should be perfect, including setting up the development aim and plan; build and perfect the law systems and regulations; enhance the research and setting of the design laws and regulations for the housing of elderly people;
- The diversification financing mode of multi-level should be developed. The government should play main role in absorbing and using the social capital and encouraging the personal and family to invest in the aging house.
- Expand propagandizing and present good guidance.
- The aging facilities like the nursing home and home for the Aged should be built more.

D. Residential Units Should Be Adjusted to Adapt to the Smaller Family Scale

1) Confirm the function and volume of the land through the structured land transfer regulations and land-using plan, and urge the developer to develop housing that adapt to the future family structure requirement

2) Favored policies in taxation and credit should be attached if middle-small scale housing unit is developed and consumed

3) Promote design creation of housing products

E. Need for High Quality Housing Should Not Be Ignored and the Green Building of ES, EP and LC Should Be Developed According to the High Level Requirement

1) Products of Individualization and diversification should be promoted to satisfy the high level requirement;

2) Green building of ES, EP and LC should be developed.

F. Population Structure Should Be Adjusted and Gathering of Population to the Outskirts of Town

1) Population scale should be controlled and the population structure should be optimized;

2) Supply mode the suburb housing should be optimized and the population should be lead to gather to the outskirts of town

- The site selection of the indemnificatory housing should be well planned;
- The supporting facilities for the suburb housing should be perfected to convenience the living of the people and prevent the separation of the living space and working space
- The industry structure in the suburb should be optimized and the population suburbanization should be promoted

CONCLUSIONS

The main objective of this analytical study was to provide the optimization measures to adjust the housing supply in future in Shanghai according to the housing demand. While because the housing demand is mainly decide by the population, so the characteristics of population variation trend is forecasted with statistics data from population census, then the housing demand is forecasted. This research has got 6 conclusions including the increase construction of the indemnificatory housing, the suitable appropriate allocation of housing in accordance with the five characteristics of population variation including total population keeps on increasing, the population space distribution, shown in Figure 2. This research aims at solving the difficult house supply problems that Shanghai is facing and will face in the future because of great changes in population variation based on the real conditions of Shanghai.

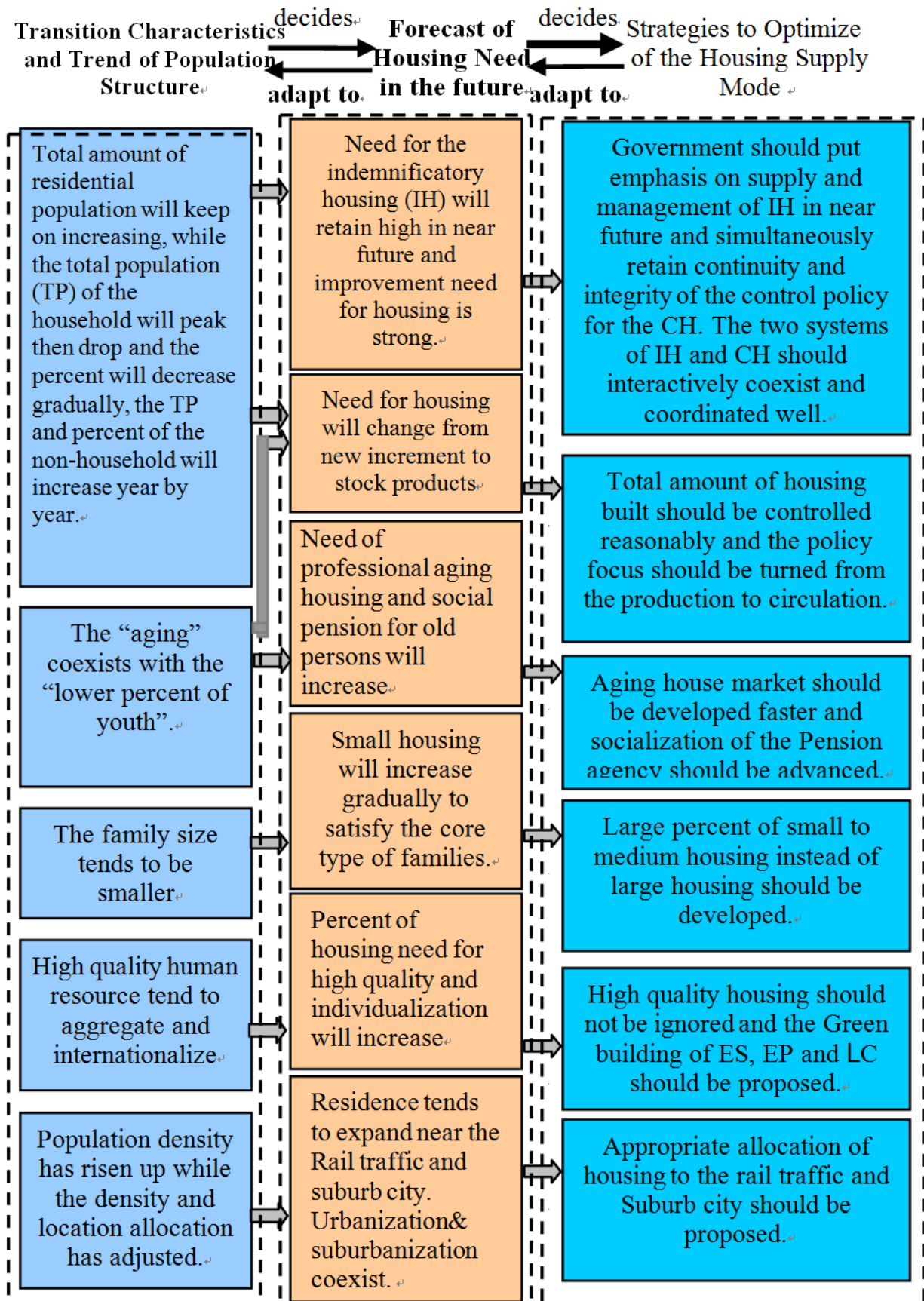


Figure 2
Shanghai’s Population Variation Trend, the Housing Need in Future and the Strategies to Optimize the Housing Supply Mode

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