Rapid housing development in the Seoul Metropolitan Area

Lessons for the Dutch Randstad?

Thesis, master Real Estate Studies

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To Lilian, Rian, Asha, Mark and Ineke.

Thank you for your patience and support.

Summary

Driven by its economic development South Korea has made enormous economic progress the last 50 years. This development, combined with demographic factors, led to a 600% increase in households in the Seoul Metropolitan Area (SMA) and a rapid housing development. From a Dutch perspective this is interesting since the Dutch Randstad area experiences tension on the housing market because of relatively slow housing development. The goal of this thesis is to answer the following research question: *'What can be learnt from the housing development in the Seoul Metropolitan Area to accelerate the housing development in the Dutch Randstad area?'*

With respect to the comparability of the housing markets of the SMA and the Randstad the following conclusions are drawn:

- The current housing market of the SMA and the Randstad show many similarities. They are largely comparable but specific circumstances originate from different backgrounds.
- The rapid urbanisation and population growth put a significantly higher demographic pressure on the SMA. This is reflected in household and housing supply figures.
- Because of the political structure and the top down organisation, strong policy changes are more feasible in the SMA than in the Randstad.
- To fulfil the housing demand, the Dutch government actively created a social renting sector, where the Korean government mainly used planning and fiscal instruments.

Three theoretical approaches are used to study the determinants of housing development speed. On a macro level the four-quadrant model and the stock flow model describe the relation of different variables in the real estate market for the long and short term. This generates insight to the general market principles. The institutional approach provides a useful complement on the meso level with respect to influences on housing development. On this level, institutions stabilise the housing market by reducing market uncertainties, but at the same time bound market behaviour. This leads to a different market outcome and housing development. On a micro level the behavioural approach shows the important context of the individual in decision-making. It explains a lagged reaction on changes in the housing market and an overreaction when changes become behaviourally apparent. In total, all three theories are interconnected. The neoclassical theory directly impacts formal and informal institutions and behavioural theory. Formal and informal institutions internally interact and directly influence the other two theories. Finally, behavioural theory influences institutions directly and neoclassical theory through the body of institutions.

After conducting research and expert interviews it is concluded that the Korean government took large-scale action to fulfil the housing demand. A quantitative approach was chosen to quickly create millions of housing units that were affordable for both the government and the tenants. Around the turn of the century the quantitative goal was achieved. The focus then changed towards the quality of housing and replacement of outdated stock. These policies have become more affordable because of an increasing GDP. In addition, property rights are increasing, and combined with a higher quality of housing and the shift towards brownfield development, a decrease in housing development speed is expected. Based on the constant high housing supply ratio in the Netherlands, the shift from quantity to quality, or redevelopment, was made earlier. Because of that, the scale of governmental interventions was smaller and the housing development speed lower. Coming from different paths, Korea and the Netherlands might end up in the same housing market situation, only with a very different cityscape. Nevertheless, the study of the Korean path provides usable insights for the Netherlands.

In conclusion, it is possible to draw a number of lessons from the rapid housing development in the SMA. First of all, the role of the government is an important factor, together with the possible means to influence the housing market and the cultural values present in the society. Secondly, the possibilities for large-scale development of green fields create potential for voluminous housing production. Thirdly, the restrictions on height and the popular opinion on high-rise building have an impact on the possibility to speed up the housing development. Finally, the position of executors of housing production projects can influence the development speed of housing. A number of these lessons are possibly applicable to the Randstad. To determine their relevance further research is needed with respect to limiting the role of the government, housing development as a political issue, development of greenfield locations, the impact of height restrictions, the possibility of contracting parties to execute housing projects, and possibilities to improve the image of high-rise housing.

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1. Introduction

1.1 Motivation and background

Cities have undergone an enormous growth in the recent past due to rapid urbanisation. They had and have to accommodate more and more inhabitants and this changed their cityscape significantly. The way cities coped with this growth varies from country to country. This thesis focuses on what can be learnt from the housing development that facilitated the population growth in the metropolitan area of Seoul in South Korea, named 'Korea' from here. As one of the Asian 'tigers' Korea experienced a rapid economic development during the last decades. Between 1970 and 2008 the country experienced the second largest economic growth in the world with an average of 6,8% per year (UNICEF, 2010). With this economic growth, Korea's urban population increased rapidly, as in most countries in economic development. Nowadays Korea has an urbanisation rate over 80%, which is relatively high on a world scale (UNSD, 2009). At the same time the total number of individual households also increased because of a growing total population and a declining average household size (NSO, 2000; Park et al., 2002). These two facts have led to a significant increase in the demand for (better) housing in Korea's urban areas in the last four decades. The growing demand on the Korean housing market has led to significant shortages on the urban housing market and rapidly increasing housing prices (Hannah et al. 1993, Yoon, 1994). The Korean government frequently intervened in the housing market to end the housing shortage and to guarantee a sufficient supply as well as a stable price. From 1960 to 2000, Korea more than tripled its housing stock from 3,5 million to over 11,4 million housing units (NSO, 2000). The 2003-2012 'one million rental housing construction plan' was the most important housing policy program of the Korean government so far (Park, 2007). This plan was recently upgraded to the production of 2,6 million rental housing units before 2017 (OECD, 2007). However, the Korean government was only responsible for about one third of the new residences being built since 1990, as private parties realised the majority of the growth in the housing stock (MLTM, 2008).

The growth of the Korean housing stock is relatively large in comparison to Western countries. From 1960 to 2000 the average growth of the Korean housing stock was 3,0% annually versus 2,1% for the Netherlands (NSO, 2000; CBS, 2010). More recently the difference in relative growth has become more significant. From 2000 to 2005, the Korean housing stock grew with an average of 2,9% per year, adding a yearly average of 351.000 houses to the stock (Statistics Korea, 2006). In the Netherlands the growth of the housing stock was much lower with an average growth of 0,8% per year over the same period, adding a yearly average of only 54.000 houses to the stock (CBS, 2010). This relatively low growth in the Netherlands is not large enough to fulfil the Dutch housing demand.

As a result, it causes tensions on the local housing markets, mainly expressed as a qualitative shortage of housing. Therefore the market is relatively immobile, qualitative housing is relatively expensive and the market accessibility of starters is relatively difficult (VROM, 2006). The problems on the Dutch housing market are especially present in the *Randstad* area, the demographic and economic centre of the Netherlands where the pressure on the housing market and the need for rapid housing development is the highest. From this point of view, insights in how Korea achieved its rapid housing development in its demographic and economic core, the Seoul Metropolitan Area (SMA), could be useful to tackle the problems that occur in the Randstad. The SMA is one of the largest and most densely populated agglomerations in the world, with about 24 million residents - almost half of Korea's total population (Statistics Korea, 2008). The city of Seoul forms the heart of this area and is Korea's primate city. Most of the pressure on the Korean housing market is concentrated in this area. On a national scale the area is comparable to the Dutch Randstad and the two areas are likely to have the same type of housing dynamics. This thesis will therefore focus on the SMA and the Randstad. By focussing on two specific areas instead of two countries in general the research is simplified and other housing dynamics in peripheral areas are left aside.

1.2 Definition of problem, goal and research question

The determinants of the Korean housing market are well described. A large amount of descriptive literature on supply and demand in the housing market is available (Yoon, 1994; Lee and Choi, 2007; Park, 2007) and much is written about housing finance in Korea (Lee et al., 2003; Lee et al., 2005; Hwang et al., 2006). Furthermore, the effects of housing development, on income and living quality, are also well described by Ha (1999), Dymski and Isenberg (2002) and Park (2007). On the other hand, at the moment there is no insight into what exactly determines Seoul's rapid housing development compared to the Randstad. In international literature very little information is available about the composition of housing development speed. Yoon (1994) briefly describes the financial side of Korean housing development but insights in other parts of the development process remain scarce. The goal of this thesis is to gain more insight in the housing development in the SMA to come to feasible recommendations to accelerate the housing development in the Randstad. In this way the problems on the Dutch housing market due to the relative low growth of the housing stock could be tackled. The following main research question will be leading for this thesis:

What can be learnt from the housing development in the Seoul Metropolitan Area to accelerate the housing development in the Dutch Randstad area?

To answer this question the research will be divided into the questions below. Each question will be answered individually in the following three chapters. This will lead to the conclusion in the final chapter where the main research question will be answered.

1. *To what extent are the housing market of the Seoul Metropolitan Area and the Dutch Randstad area comparable? (chapter 2)*
2. *What determines the speed of the housing development? (chapter 3)*
3. *What explains the rapid housing development in the Seoul Metropolitan Area? (chapter 4)*

1.3 Conceptual model and structure of thesis

Within every chapter a subdivision is made intro three levels of analysis: a macro, meso and micro level. In this way differences between the two research areas can be attributed to a specific level. This is important to determine to what extent recommendations based on differences are implementable in the Dutch situation. Chapter 2 analyses the markets of Korea and the Netherlands. When studying the Korean housing development in relation to the Dutch development, it is useful to start with generally comparing the two countries for two reasons. Firstly, a general comparison will put both countries in perspective to one another. Secondly, and more importantly, a comparison will tell something about the comparability of the housing development in the two countries. Differences in the context affect the development characteristics themselves and should therefore be taken into account when conducting this study. Multiple contextual differences will not only make it more complex to draw accurate conclusions but will also increase the uncertainty about the outcomes. Some recommendations might not even be implementable under the different circumstances. The answer to the first research question in chapter 2 will be based on a literature study and statistical data on the housing market, i.e. from both the national statistics offices and specific research institutes on housing. The chapter starts with a description of the national market. Then the influence of governmental institutions is described. And finally the supply and demand on the housing market is explored. Chapter 3 will form the theoretical framework of this thesis. On three levels of analysis, three mainstream theories are analysed for their impact on housing development speed. Firstly, on a macro level the neoclassical theory is used to describe general housing market mechanisms. Secondly, on a meso level, the institutional theory is analysed to describe its formal and informal impact on housing development speed. Finally, on a micro level the behavioural characteristics of actors on the housing market and their impact on development speed is reviewed according to behavioural theory. For each level, the theory is chosen that has the most impact on this level and explains it the best. On a macro level, economics are the most important, on a meso level institutions like governments have the most influence and on a micro level the individual behaviour

has the most impact. This does not mean the theories do not influence the other levels, but to simplify the analysis they are connected to the level they influence most. In this chapter, the second research question will also be answered through a literature study. It contains a study on the important theoretical geographical approaches, focussing on the housing development and its impact on housing development speed. Chapter 4 will combine the description of the market from chapter 2 and the theoretical analysis from chapter 3 to derive fields of interest for further in-dept research. To answer the third research question, a series of expert interviews was conducted with different stakeholders involved in the housing development in the SMA, i.e. local and national governments, housing developers and real estate experts. This is supplemented with own observations in the SMA and additional written information resulting from the interviews. This will lead to concrete hypotheses on the rapid Korean housing development. In chapter 5, the answers to the individual research questions function as the foundation for the conclusion, which results in the answering of the main research question. After the bibliography in chapter 6, a list of definitions is given in chapter 6 along with other appendices.

2. The housing market

When comparing the housing market in the SMA and the Randstad, three levels of influence on the market can be distinguished. On a macro level national market trends and national institutions influence the circumstances in which the housing market is formed. On a meso level local governmental rules and regulations limit the playing field of the market. Further on a micro level, the behaviour of the individual household or company determines the demand and supply of housing. This chapter discusses the influence of all three levels on the housing development in Korea to gain a clear insight on what level the housing markets are comparable. The first paragraph describes the influences on the housing market from the macro level. This section elaborates on national trends and provides an overview of the key figures of Korea and the Netherlands and the research areas. Then, on a meso level, the influences of local governmental regulations on the housing market are described in the second paragraph. This is followed by a microanalysis of the housing demand and supply in the third paragraph. The last paragraph concludes this chapter by answering the first research question of this thesis: '*to what extent are the housing market of the Seoul Metropolitan Area and the Dutch Randstad area comparable?*'

2.1 National trends

This paragraph introduces Korea, the SMA, the Netherlands, and the Randstad and reviews several key national trends that influence the housing market on a national level. Successively human development, economy, demography, urbanisation and the political situation are discussed.

2.1.1 Introduction to research areas

The Korean population is about three times as large as the Dutch population: 48,2 million against 16,5 million in 2008 (see table 2.1). Since the total surface of Korea is also larger than the Netherlands, the population density is more or less comparable. The distribution of the population across the total surface of the two countries is well over 400 inhabitants per square kilometre. This places both countries in the top five of most densely populated countries of their size in the world (UNPD, 2009). Naturally, in neither of the countries the population is evenly distributed. In both countries the majority of the population, over 80%, lives in urban areas. This is comparable to most highly developed countries (Knox and Marston, 2003). A significant difference between Korea and the Netherlands can be found in the overall land use. Korea has large mountainous areas; these areas are less suitable for large-scale real estate development and are sparsely populated. This is reflected in the high percentage of forested area in Korea, the most feasible land use in the mountainous parts of Korea. In contrast, in the Netherlands almost all land is relatively flat and very suitable for large

scale building developments. This means that the average population density in inhabited areas in Korea is probably higher than the figure in table 2.1.

Table 2.1: Geographical overview of Korea and the Netherlands in 2008

	Korea	The Netherlands
Population	48,200,000	16,500,000
Surface area (km^2)	99,678	37,354
Population density (per km^2)	483.1	442.5
Urban population (% of population)*	81.3	81.3
Forested area (% of land area)**	64.5	10.9

* data 2005-2010, ** data 2007. (UNSD, 2010)

The definitions of the areas under research are not unambiguous. Both areas are a conception and because of the absence of strict boundaries, the concepts are subject to change. In general, both areas consist of one or more cities and the surrounding urban agglomeration around it. But to what extent a surrounding urban area is part of the agglomeration is arbitrary. An indication of the interconnectedness of attached areas could be derived from existing infrastructural connections or from patterns of commuter traffic. However, this method is time consuming and would again not lead to incontestable boundaries. Therefore, in this thesis the areas will be captured in existing administrative boundaries (see figure 2.1). This will clearly define the areas and simplify further data collection. The SMA logically arises from the city of Seoul and is situated in the north-eastern part of Korea, close to the border with the Democratic People's Republic of Korea (North Korea from here). The city forms a network with several other cities of which Incheon is the most important. The cities of Seoul and Incheon are independent administrative entities, the other cities are situated in the province of Gyeonggi (Park, 2007). The term Seoul Metropolitan Area in this thesis refers to the administrative entities of Seoul, Incheon and Gyeonggi. The literal translation of the Randstad is ‘edge city’ which refers to the shape of the area. It can be seen as a ring of cities on the edge of a preserved green centre, the so-called ‘green heart’. The basis of the Randstad is formed by the four largest cities in the western part of the Netherlands: Amsterdam, Rotterdam, The Hague, and Utrecht, located in the provinces of North Holland, South Holland and Utrecht. In this thesis the three provinces mentioned above are considered to form the Randstad area.

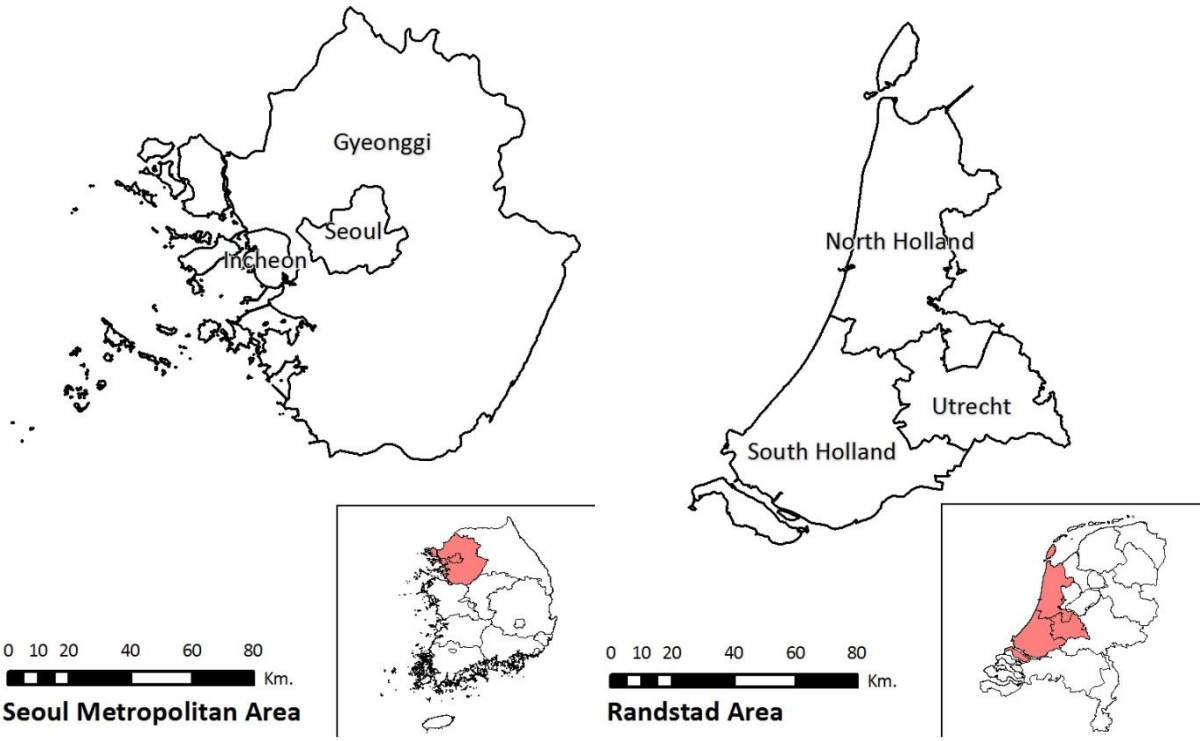


Figure 2.1: Seoul Metropolitan Area in Korea and Randstad area in the Netherlands (Geocommons, 2008)

2.2.1 Human development

The human development index measures different aspects of a county's development and is widely used to compare the current development of countries. The United Nations rank both Korea and the Netherlands as "very high human developed" countries, the highest level on the Human Development Index. Only 42 of the 169 countries in the ranking are categorised as such and Korea is one of the nine non-western countries in this category (UNDP, 2010). The index ranks the world's countries according to their level of human development based on three dimensions: health, education and living standards (UNDP, 2010). Most of the underlying figures of the index of both countries projected in table 2.2, such as life expectancy, mean years of schooling and expected years of schooling are comparable. Only the gross national income at purchasing power parity per capita differs significantly. Korea's gross national income per capita is only 75% of the Dutch figure, explaining the lower ranking of Korea on the Human Development Index. But still both countries can be seen as modern developed countries according to this index.

Table 2.2: Korea and the Netherlands according to the Human Development Index 2010

Human Development Index indicators	Korea	The Netherlands
Human Development Index (rank out of 169)	12	7
Human Development Index (index)	0.877	0.890
Life expectancy at birth (years)	79.8	80.3

Mean years of schooling (years)	11.6	11.2
Expected years of schooling (years)	16.8	16.7
Gross national income per capita (PPP US $)*	29,518	40,658

* Data 2008. (UNDP, 2010)

2.2.2 Economy

On a world scale The Korean and Dutch economies belong to the top 20 economies in the world. In 2008 Korea was considered the 15th economy in the world and the third economy of the Asian continent. The Dutch economy ranked 16th in the world and sixth in Europe. Therefore, the absolute economies of Korea and the Netherlands are comparable to larger countries like Turkey, Australia and Mexico (World Bank, 2009). The high ranking of Korea is a recent development. The Netherlands has been ranked around the 15th place since 1960 but Korea only since the 1990s. Until the early 1970s the Korean economy was ranked around the 30th place in world economies, but was less than a quarter of the size of the Dutch economy (World Bank, 2009). However, since then the economy developed very rapidly. Between 1970 and 2008 Korea had the second largest average economic growth per year in the world, behind China (UNICEF, 2010). The absolute size of the Korean and Dutch economies is visualised in figure 2.2. The Korean economy grew to half the size of the Dutch economy in the early 1980s and even surpassed the Dutch economy in 1991 for the first time. Deregulation of the strictly controlled Korean financial market caused an economic crisis in 1997. This explains the first dip in the Korean graph. The second dip can be explained by the world financial crisis, which reached Korea earlier than the Netherlands because of its strong economic ties with the United States. During the last decade the Korean economy has been slightly bigger than the Dutch economy (World Bank, 2009).

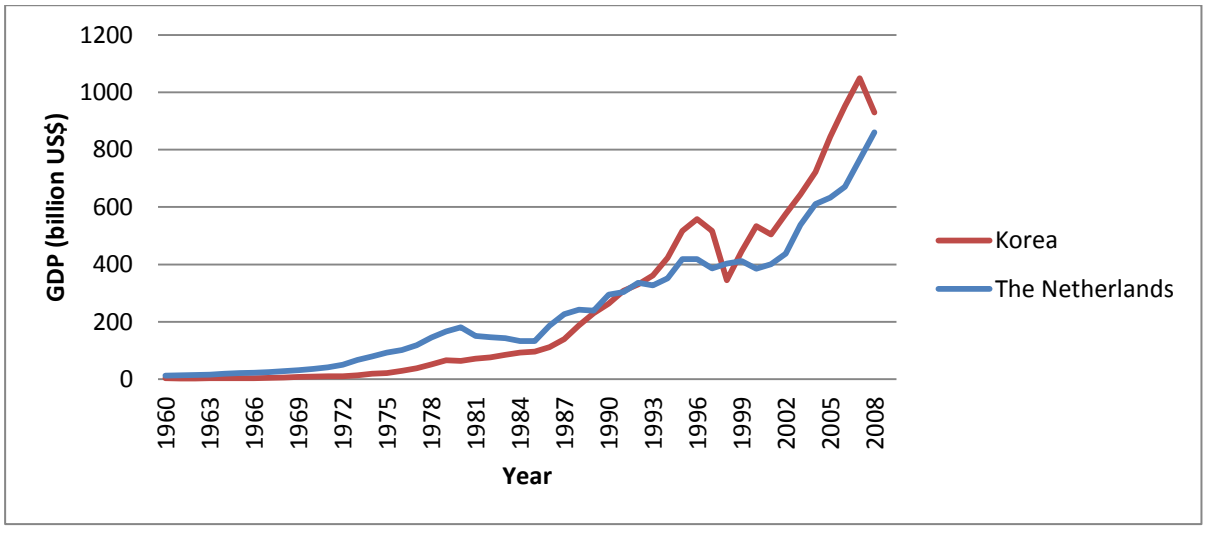


Figure 2.2: Gross domestic product (GDP) per year in billion current US$ (World Bank, 2009)

The division of labour into the different economic sectors in table 2.3 shows an image similar to most modern economies (Knox and Marston, 2003). In both countries the service sector is by far the largest sector and only a relatively small percentage of jobs can be found in the agricultural sector. This means that the economy has developed from an agricultural and later industrial orientated economy towards a more modern service oriented economy. The Netherlands has advanced relatively further into this process, given the smaller percentages of employment in the agricultural and industrial sector (Knox and Marston, 2003).

Table 2.3: Employment per economic sector 2008 (% of employed)

Economic sector	Korea	The Netherlands
Agriculture	7.4*	2.7
Industry	25.9*	18.2
Services	66.7*	79.1

* Data 2007. (UNSD, 2010)

2.2.3 Demography

Korea experienced an enormous population growth of almost 250% over the last 60 years. The Dutch population grew about 60% over the same period. However, the growth in both countries is slowing down. According to estimates of the UNPD (2009) the population of Korea and the Netherlands will reach their peak in 2035 and will then start to decline (see figure 2.4). The population of the SMA and the Randstad developed according to the same growth pattern of their home country. This means that eventually the population of these areas will also decline.

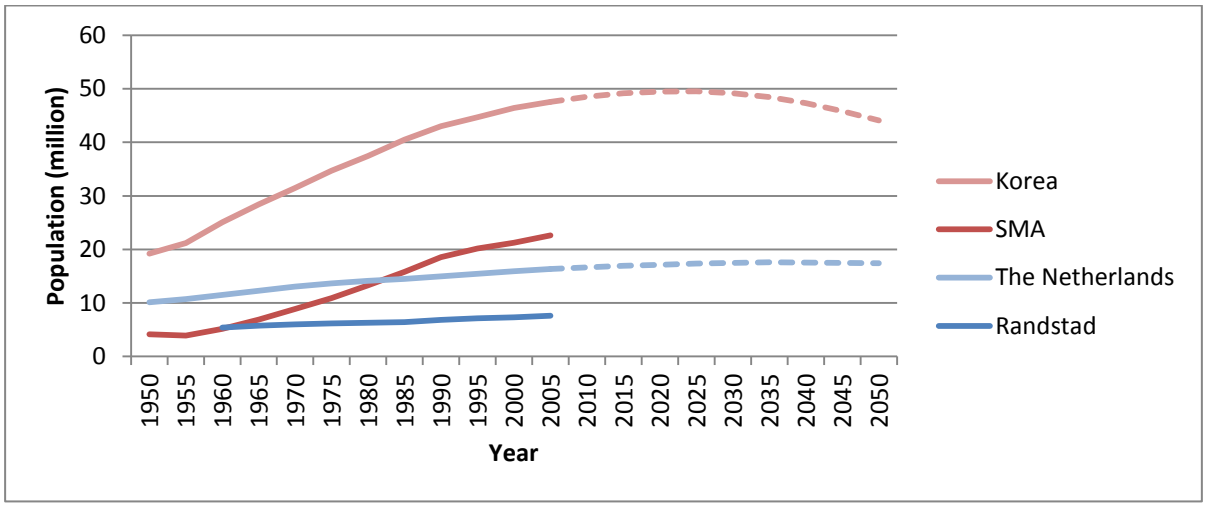


Figure 2.3: Population and population estimate per million (UNPD, 2009; CBS, 2010; Statistics Korea 2010)

Three factors explain the future population decline. Firstly, the fertility rate, the number of children per woman, in both countries is declining. In both countries the fertility rate is lower than the average replacement level of 2.2, in the Korea this is the case since 1985 and in the Netherlands since 1970. Currently the fertility rate is 1.22 in Korea and 1.74 in the Netherlands (UNPD, 2009). Secondly, the net migration is not large enough to compensate for the declining fertility rate. Over the last five years the average net immigration was -6.000 per year for Korea and 20.000 per year for the Netherlands (UNPD, 2009). Thirdly, the life expectancy in both countries has been growing, i.e. the death rate has been declining leading to a future decline of population. Since the first measurements in 1950 the life expectancy has risen 31.5 years in Korea and 7.9 in the Netherlands. Today both countries have a comparable life expectance of just under 81 years (UNPD, 2009). This postponed the population decline significantly and therefore the population in both countries did not decline earlier. The future decline of the population has a negative effect on the future housing demand. But this does not necessarily mean that the housing demand in the research areas will decline accordingly. Other variables may postpone a decline in housing demand. These variables will be described below.

The SMA and the Randstad are the cores of two of the most densely populated countries in the world. The SMA is even the third largest urban agglomeration in the world (UNPD, 2010). The total population and the surface of the area are larger than the Randstad (see table 2.2). The population is about three times larger and the surface area about 70% larger. Because of that, the population density of the SMA is about twice as high as the Randstad. On a relative scale the areas are more comparable. Both areas accommodate almost half of the country's population in only a relatively small part of the country and the population density is significantly higher than the national average.

Table 2.4: Geographical overview of the Seoul Metropolitan Area (SMA) and the Randstad in 2005

	SMA	Randstad
Population	22,621,232	7,228,775
Surface area (km^2)	11,649	6,875
Population density (per km^2)	1941.9	1051.5
Population as percentage of national population	48.1	44.3
Surface as percentage of national surface	1.8	20.3
National population density (per km^2)	436.5	482.6

(CBS, 2010; Statistics Korea, 2010)

2.2.4 Urbanisation

Looking at the historical pattern of urbanisation it appears that Korea has experienced a very rapid urbanisation. As figure 2.4 shows, Korea's urbanisation rate almost tripled since 1960. The relative growth from 1960 to 2008 is 195%, whereas the urbanisation rate of the Netherlands only grew by 38% over the same period (UN, 2010). The growth of Korean cities is enormous in comparison to the Netherlands. The SMA and the Randstad are mostly, if not completely, urbanised. Therefore the growth of the urban population has had an equal effect on the housing demand in the research areas. Urbanisation prospects indicate that urbanisation rates will keep growing in the future to about 90% in 2050. This means that the housing demand in both research areas will grow another 12.5% in the next 40 years due to the growing urban population. Urbanisation mostly attracts the labour force, leading to a relatively young urban population. It also results in the agglomeration of education and capital (Knox and Marston, 2003). The latter leads to higher expenditures on the housing market and to higher average housing prices. This will be discussed in the last paragraph of this chapter.

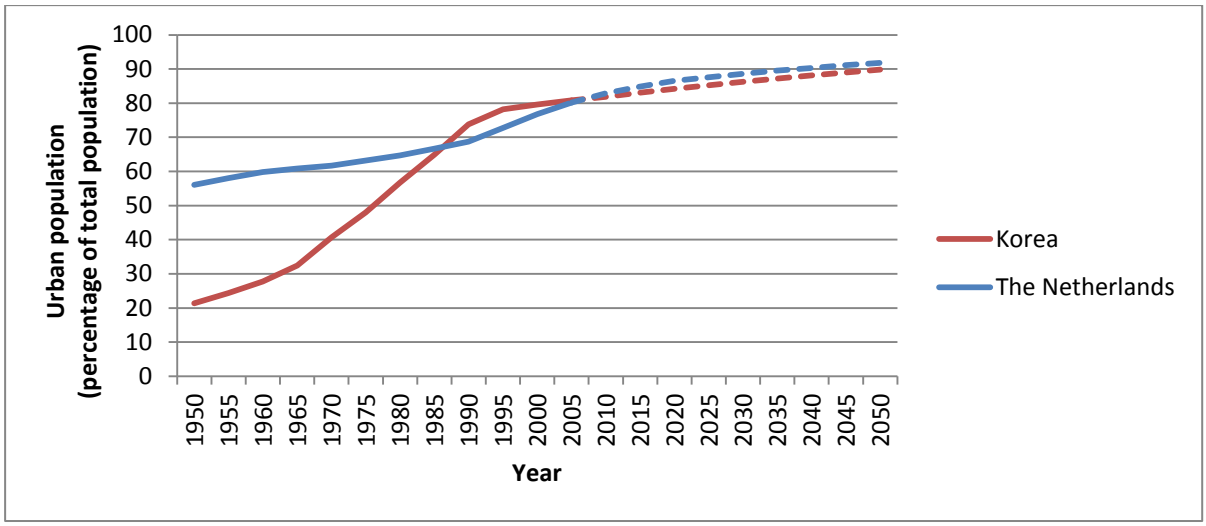


Figure 2.4: Urban population as percentage of the total population (UNPD, 2008)

2.2.5 Political situation

The Republic of Korea elects a president every five years and a legislative parliament every four years. Open elections only exist since 1987 when the semi democratic military government stepped down. From 19 years of age all Korean citizens are allowed to vote. The president appoints the prime minister and other ministers with consent of parliament. Two large and multiple smaller parties form the parliament, of which the conservative Grand National Party currently has the majority. The current president of Korea also belongs to this party (CIA, 2012). For Korea, a noteworthy political

issue is the relation with North Korea, adjacent to the SMA. Their relationship is tense but despite of regular incidents relatively stable. The Netherlands is a constitutional monarchy and chooses a parliament every four years. All national citizens of 18 years and older are allowed to vote. The monarchy mainly has a symbolic function with the Queen as the head of the state. The parliament consists of various parties. The leader of the majority coalition usually is appointed as prime minister and selects a team of coalition ministers. The most recent coalition existed of a liberal and Christian party, with liberal prime minister. The legislative power is in hands of another body, indirectly elected by 12 provincial councils (CIA, 2012).

2.3 Governmental regulations

This paragraph describes the governmental interventions in the Korean and Dutch housing market. Three ways of intervention are distinguished: social housing, planning and fiscal measures. These subjects are discussed in separate subparagraphs.

2.3.1 Social housing

Public ownership of housing, i.e. social housing, is not widespread in Korea for an economic and a cultural reason. From an economic point of view, until the 1990s, social housing has been too expensive for the Korean government. In a developing economy capital was relatively scarce and the return on investment had to be achieved quickly. The government followed an 'economy first' policy and mainly stimulated economic sectors with a rapid return on investment like the (exporting) manufacturing industries (Yoon, 1994; Park 2007). Following this policy, housing development was financially less import because public housing would use the scarce national capital for too long. However, due to the maturation of the economy social housing became more affordable during the last decade. Nowadays about 10% of the total housing stock is publicly owned (Statistics Korea, 2010). From a cultural point there is a strong bias towards homeownership. Social housing has a negative connotation because the few social housing projects that took place between the 1950s and the 1990s were constructed with low budgets and provided relatively poor living conditions. Dwellings were relatively small and were inhabited by multiple families (Yoon, 1994). Also, Koreans believed that economic development would eventually make social housing unnecessary. Since the turn of the century this idea is changing. Due to the free market conditions the gap between housing for rich and poor widened and private housing for all does not seem realistic anymore. Therefore, since 2000 the Korean government mainly focuses on creating affordable housing for the lowest income classes (Park, 2007). Backed by the financial possibilities of the matured economy, the national government recently announced plans to triple the social housing stock (OECD, 2007;

Statistics Korea, 2010). In contrast to the situation in Korea, social housing is more common in the Netherlands. The Dutch government has chosen a social approach towards housing, instead of an economic approach and provided public housing for large parts of the population through governmental institutions since 1900. These subsidised institutions now own 35% of the current Dutch housing stock. This percentage is even higher in most large cities in the Randstad area (CBS, 2010). The living quality in publicly owned dwelling is more or less comparable to private developed dwellings, backed by laws on living conditions such as the *Woningwet* (Housing Act) and the *Bouwbesluit* (Building act). Therefore, living in publicly owned dwellings is perceived equal to living in standard privately owned housing. Since the 1990's the public housing institutions have been privatised into semi governmental institutions with a restriction to make a profit (Ekkers, 2006). These institutions are responsible for the distribution of the publicly owned housing based on income and a waiting list.

2.3.2 Planning

In the 1950s and 1960s the Korean government did not take an active role in housing planning and production. Housing was only developed in small-scale projects by small land owners and developers. To fulfil an increasing housing demand, from 1970 strong governmental interventions have been the main drivers of the growth of the Korean housing stock. Consecutive administrations made housing a key issue in their policies. Between 1970 and 1990 they established large scale plans such as the 1972 'ten years plan for building 2,5 million housing units' and the 1987 'five years plan for building two million housing units'. The latter was directly focussed on the area around Seoul: five satellite cities (new towns) were to be developed around this city (Yoon, 1994). Governmental enterprises intervened in almost all-new housing and land development. The execution was largely put out to designated private conglomerates, *chaebols*, to directly stimulate the national economy. From 1990 until now the Korean economy changed to an open economy with less state controlled housing development. In 2008 the privatised Korea Land and Housing Corporation (LH) together with local affiliates controlled about 30% of new building projects. Private parties were responsible for the other 70% of housing development (MLTM, 2008). Recently focus of governmental plans shifted to rental housing with the 2003-2012 'one million rental housing construction plan' (Park, 2007) This plan was upgraded to the production of 2,6 million rental housing units before 2017 (OECD, 2007). The Korean planning system is centrally organised; the central government uses five-year plans to steer socioeconomic development and spatial planning. The latter is instituted through Comprehensive National Territorial Plans that form the framework on which provinces and cities base their Comprehensive Provincial and City-level Plans. The SMA deserves special attention from a

planning perspective. Because of their size the two major cities in the area, Seoul and Incheon, are separate administrative entities comparable to provinces. The SMA also has its own Capital Area Development Plan, directing all planning efforts in the region. The importance of this plan is underlined by the fact that the prime minister chairs the responsible committee (MLIT, 2012). On a local level cities or districts are responsible for enforcing zoning of land, the presence of public facilities and the technical building quality. Bengston and Youn (2005) describe the greenbelt policy around the city of Seoul as an example of strict urban containment.

The Dutch government has always had strong central control on housing production through a centralised planning system. It initiated the majority of all post-war housing reconstruction; mainly the production of relatively cheap social rented housing units in urban areas to fulfil the post-war demand (Ouwehand and Daalen, 2002). This production was carried out by small-scale non-profit housing associations supervised by the government. To control the post-war urbanisation in the 1950s and 1960s, the national government appointed so-called growth cities for large-scale suburbanisation. In the 1970s and 1980s the housing development sector scaled up but the government remained the main initiator of housing development. Until the end of the 1980s about 70% of all housing production, rental and owner-occupied, was subsidised by the government (CBS, 1999 cited in Boelhouwer, 2005, p. 364). In the 1990s the government introduced the compact city policy for urban renewal. The focus gradually shifted towards better quality, and as a result more expensive housing (Ouwehand and Daalen, 2002). Furthermore, the subsidised housing policy changed and private home-ownership was stimulated. The subsidised rental housing production decreased from 60% in the 1960s to 25% in the 1990s and private developers became more important in housing production. With respect to the planning system the Netherlands is more decentralised than Korea. The National Spatial Strategy (Nota Ruimte) for 2006-2020 reduced national regulations and emphasised local judgement to simplify decision-making procedures. The parallel Structure Visions of national, provincial and municipal governments are not binding for lower level governments, only for the government that has created the plan. Local governments are responsible for complete zoning plans for each municipality. They also enforce the strict policies on technical and architectural building quality. Only when national or provincial interests are at stake, an Integration Plan can adjust the local zoning plans. For the governance of the Randstad there is no separate entity, but initiatives like the Structural Vision Randstad 2040 do exist (MLIT, 2012). Also in the Randstad the green heart in the centre of the area is also protected by government policies. According to the Dutch national government the green heart of the Randstad is not a place for large-scale urbanisation (VROM, 2006).

Table 2.5: Governmental housing planning policies in Korea and the Netherlands

	Korea	The Netherlands
1950s – 1960s	No active role	Urbanisation policy
1970s – 1980s	Large scale five-year plans	Suburbanisation (growth cities)
1990s – 2000s	Continuous growth and deregulation	Deregulation

2.3.3 Fiscal measures

Until 1993 the Korean financial market was strictly regulated. The Korean government used price caps for new dwellings to prevent housing prices to rise excessively. This kept private developers away from developing private land because of the high land price. Their main focus was on the development of public land, sold under the market price to meet production and price goals (Park, 2007). From 1993 the financial market was reformed and opened up the global market. This destabilised the Korean economy and lead to an economic crisis in 1997, which was overcome relatively quickly. The private housing market was stimulated and stabilised by several financial incentives. The market was stimulated by the abolishment of the fixed price level for privately developed housing and new ways of housing finance, such as mortgage backed securities and loans for first time buyers. Stabilizing measures such as a mortgage ceiling for first time buyers of 70% of the total sum and tax policies against speculation were introduced. From 1998 the government also created several object subsidies to stimulate affordable housing for the lowest income groups (Park, 2007). Due to scarce long-term capital in the past, Korea's has two specific tenure types. Firstly, the unique *chonsei* system, which literally means 'total rent'; the tenant pays a lump sum of 30 to 70% of the price of a dwelling for a two year rent-free use. This net payment is returned after the rental period. The private owner's profit is the (temporary) use of the capital (Park, 2007). Secondly, the monthly payment sector largely has a non-permanent character. In Korea most of the monthly rented dwellings are rented for a fixed period after which the tenant has to buy the property. This period can vary between five and fifty years and is expected to gradually increase the owner-occupancy rate (MTLM, 2008).

Fiscal measures in the Netherlands are mainly subject oriented. The two most important fiscal measures are the tax deductibility of mortgage payments and the regulation of the rental market (Vermeulen, 2008). To stimulate home ownership the Dutch government introduced tax benefits on mortgage payments around 1900. In this way housing finance became more affordable. Currently this tax benefit is under debate; with a slow growing housing stock, this fiscal measure is responsible for a significant boost in housing prices. The Dutch rental market is regulated for rent under €665 per month (Rijksoverheid, 2012). Under this rent level, the private market is subjected to an indexation

of the yearly increase of rent on signed contracts. Only new rental contracts can be adjusted to the market value. Furthermore, these rents are regulated through a complicated grading system for size and quality. Almost all public housing is of standard quality and these rents are therefore regulated. However European Union's regulations recently set an income maximum for new renters to be eligible for public housing. On the rental market the Dutch government also subsidises lower income groups. A subsidy is available for low-income renters of standard quality housing. For higher rent levels housing is subjected to the market rent.

2.4 Housing market

In three subparagraphs this paragraph looks at the drivers behind housing demand and supply in the research areas and at the housing market where the first two subjects come together.

2.4.1 Demand

The average household size in both Korea and the Netherlands has been declining since the first measurements after the Second World War. Between 1960 and 2000 the average Korean household size shrunk from 5,7 to 3,2 and the average Dutch household size declined from 3.6 to 2.3 (see table 2.6 and figure 2.5). These numbers are comparable to the current average household size in both research areas (CBS, 2010; Statistics Korea, 2010). The decline of the average household size can mainly be attributed to the socio-cultural process of individualisation and independence (Ekkers, 2006) and the decline in fertility rate. Ekkers (2006) states that economic prosperity is rather a necessity than an explanation for a decline in household size. This decline has been taking place in almost all developed countries in the world and is a significant driver of a growing housing demand. When the average household size declines by 50%, with an unchanged population size, the housing demand doubles. In the case of an increase in the population size at the same time, the number of households and the housing demand grow even more drastic. As seen in the previous paragraph, the population of the Randstad and especially the SMA grew significantly during the last decades. As a result of this growth and the decline in household size, the number of households in the SMA grew 629% from 1960 to 2000. In the Randstad the number of households grew 109% over the same period (see table 2.6). Assuming a one household per housing unit policy, the growth of the housing demand equals the growth in the number of households. This means that between 1960 and 2000 the crude housing demand in the SMA six folded and the housing demand in the Randstad doubled. The growth of the net housing demand, institutional households excluded, will be roughly comparable.

Table 2.6: Households Seoul Metropolitan Area and Randstad 1960 and 2000

	1960	2000	Growth
SMA:			
Population (million)	5,2	21,3	309%
Average household size	5,7	3,2	-44%
Households (million)	0,9	6,6	629%
Randstad:			
Population (million)	5,4	7,3	35%
Average household size	3,6	2,3	-35%
Households (million)	1,5	3,2	109%

(NSO, 2000 cited in Park, 2007, pp. 76-77; CBS, 2010; Statistics Korea 2010)

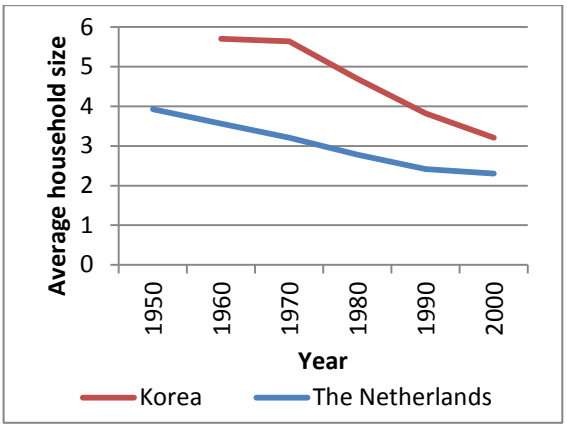


Figure 2.5 Average household size in Korea and the Netherlands (NSO, 2000 cited in Park, 2007, pp. 76-77; CBS, 2010)

Three factors play a role in the future household size: the fertility rate, the ageing population and the ongoing individualisation of society. Firstly, the future fertility rate is not declining anymore. The medium variant of the UNPD fertility rate prognosis (UNPD, 2009) expects the fertility rate in both countries to slightly increase between now and 2050. This will slow down the decline in household size. Secondly, the population of both countries is ageing in the future. The current patterns of age distribution in figure 2.6 are examples of the distribution of a contracting population, the last stage of the demographic transition that comes with economic development (Knox and Marston, 2003). In both countries the younger group is significantly smaller than the middle-aged group. The slightly growing fertility rate in the future will not compensate this unequal distribution. A relatively low natural growth of the population, a negligible migration surplus and a growing life expectancy cause the population to age. The ageing populations cause an increase in single person households. This will contribute to the decline in household size. Thirdly, the individualisation of society will continue. Therefore the household size will decline further. The extent of this individualisation is hard to predict and projections can only be made with considerable uncertainties. But, since living together and having children is still common in current society, the individualisation will not go on indefinitely and an average household size lower than two is not likely to occur. The household size in the Netherlands is already close to two, therefore the largest decline in household size due to an ongoing individualisation is likely to take place in Korea (Knox and Marston, 2003).

Taking these three factors into consideration, the household size is not going to decline indefinitely. Figure 2.5 shows that the decline in household size is already slowing down. An ageing population and an ongoing individualisation will extend this decline but eventually the decline will come to a stop. For that reason, in this thesis the bottom household size is assumed to be two. Eventually, the

number of households will start to decline along with the total population. The CBS (2007) expects household size in the Netherlands to reach the bottom in 2035; the average household size then will be two. From this point on the total amount of households will decline. The household size in Korea will probably reach its bottom about ten years later, in 2045, due to a postponed greying process caused by the slightly younger population (see figure 2.6). The decrease towards an average household size of two will increase the number of households in both countries: in Korea by more than 50% and in the Netherlands by 15%. This increase comes on top of the increase caused by the growth of the total population.

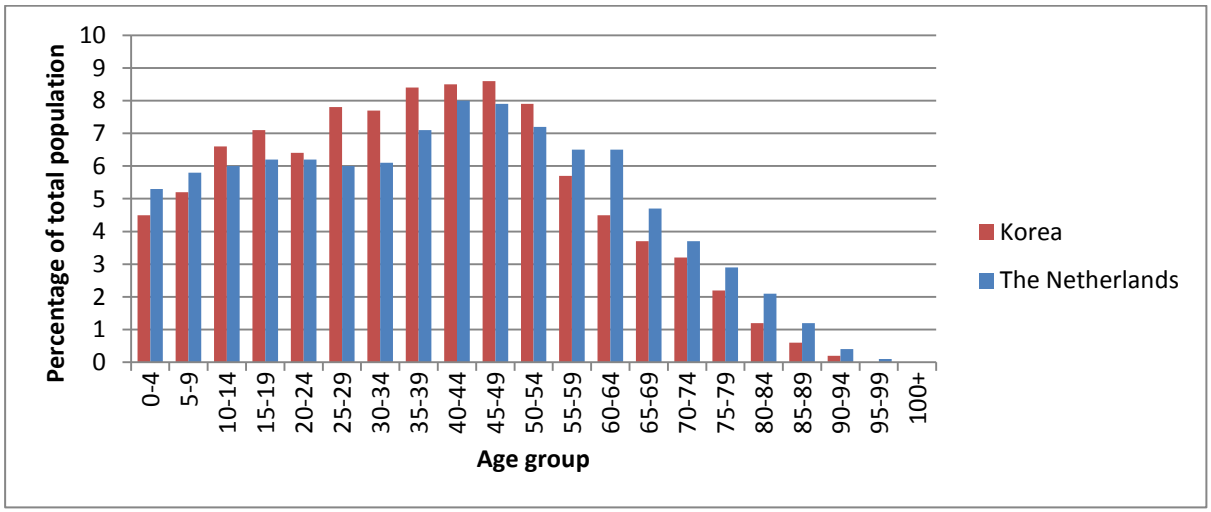


Figure 2.6: Age distribution as percentage of the total population (U.S. Census Bureau, 2010)

With the growth of the national economy, as visualised in figure 2.2, the purchasing power per capita has also grown significantly in both countries during the last decades, see figure 2.7. The drop in the Korean line is explained by the economic crisis of 1997. The rising purchasing power influences the potential expenditure on housing. Since 1980 the Dutch gross national income per capita at purchasing power parity quadrupled, in Korea it has even increased tenfold. The larger Korean growth has narrowed the relative gap between the countries' purchasing power. On the other hand, the absolute gap between the purchasing power in both countries has been growing slowly every year. The Dutch purchasing power in 1980 was 280% higher than the amount in Korea, but in 2008 the Dutch figure was only 50% higher (World Bank, 2009). The significant growth of the average purchasing power in both countries has two effects on housing demand. Firstly, it enables a larger part of the population to provide for its own housing. Secondly, it enables the population to afford better housing. Therefore a rising purchase power stimulates the quantitative housing demand as well as the qualitative housing demand. Effects of this growing demand on both quantitative supply as qualitative supply will be discussed in the next paragraph.

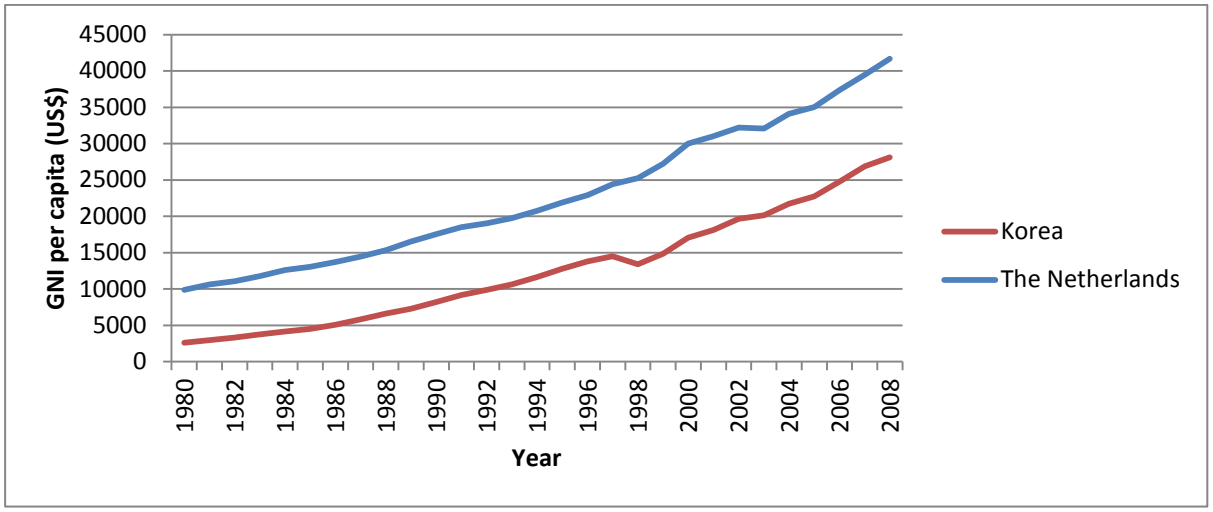


Figure 2.7: Gross national income (GNI) per capita at purchase power parity in US$ (World Bank, 2009)

2.4.2 Supply

The Korean housing demand has been growing enormously in the last 50 years and will continue to grow in the near future. This growing demand is reflected by a growing housing supply as visualised in figure 2.8. The housing stock in the SMA grew from to 1,3 to 5,5 million between 1975 and 2005. On average this is a yearly growth of 5% or 142,000 housing units. Over the same period the housing stock in the Randstad only grew from 2,1 to 3,2 million, a yearly average of 1,4% or 36,000 housing units. These growth patterns roughly follow the development of the national housing stock. The way in which Korea and the Netherlands achieved this growth will be described below.

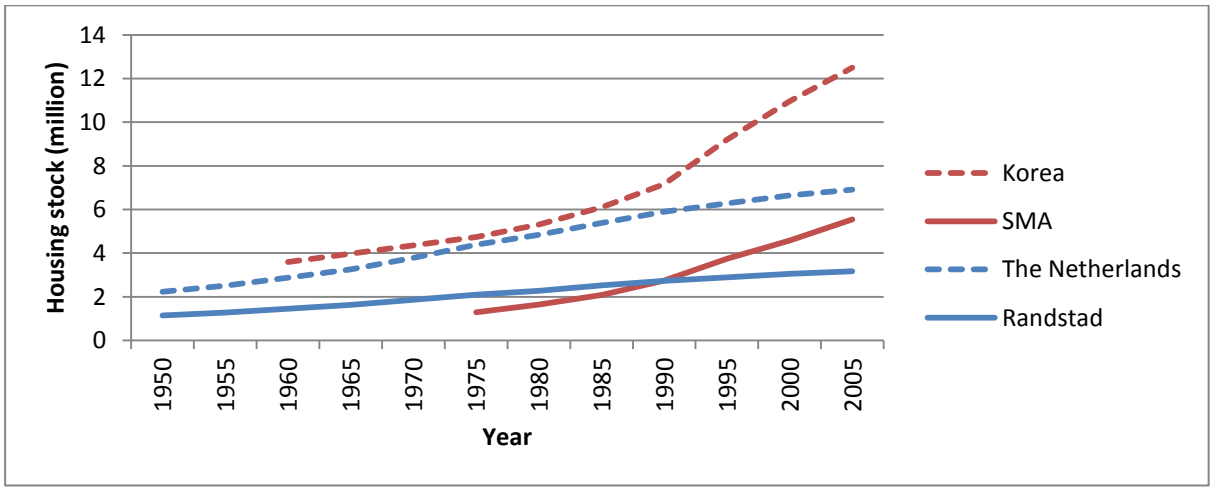


Figure 2.8 Housing stock of Korea, the Netherlands, Seoul metropolitan area and Randstad per million (EPB, 1990 cited in Yoon, 1994, p. 24; CBS, 2010; Statistics Korea, 2010)

Table 2.7 visualises the tenure per household in Korea and the Netherlands. Owner-occupation in Korea and the Netherlands is just over 50%. These figures are quite comparable. The figures for the rental sector are more difficult to compare because of the different classifications. The *chonsei* described above serves about 30% of all Korean households and can be typified as a form of housing between owner-occupancy and rent. Because of this intermediate sector, the rental sector in the Netherlands is significantly larger. This is mainly caused by the fact that the Dutch publicly rented sector is about 3,5 times larger than the same sector in Korea. This gap will probably become smaller in the future given the Korean plans of building 2,6 million rental dwellings described earlier in this chapter. Exact numbers for the SMA are not available. However, in the urban areas the owner occupancy is slightly lower than the national average in favour of the *chonsei* sector in Korea and the publicly rented sector in the Netherlands.

Table 2.7: Tenure in Korea and the Netherlands as % of total stock in 2000

	Korea	The Netherlands
Owner-occupied	54,2	52,2
Chonsei	28,2	-
Privately rented	5,5	7,3
Publicly rented	9,3	35,0
Other	2,8	5,5

(MLTM, 2008; CBS, 2010; Statistics Korea, 2010)

Looking at the type of dwellings in the SMA and the Randstad in table 2.8 it becomes clear that the percentage of apartments within the total stock is more or less comparable. In addition, in both countries this percentage is growing (Kim, 2004; CBS, 2010). A significant difference between the apartment stock in both areas is the building height. The average height is growing in both countries but in most parts of the Randstad the building height is limited to a maximum of 4 or 5 stories. Higher apartment buildings are relatively scarce in the Netherlands. In the SMA the average building height is about 6 to 7 stories, but higher apartment buildings are far more common. The average building height for newly developed apartment buildings is 30 to 35 stories high and contribute significantly to the growth of the total housing stock (Jang, 2010).

The detached dwellings in Korea are far more common in the SMA and row houses are far more common in the Randstad. This can be explained by a cultural difference in the building sector. Most detached dwellings in the SMA are placed closely to each other. In contrast, this is not allowed in the Netherlands by local architectural committees and therefore the Dutch built row houses.

Table 2.8: Type of dwellings in Seoul Metropolitan Area (SMA) and Randstad as % of total stock in 2005

	SMA	Randstad*
Apartment	53,2	46,2
Detached dwelling	38,7	13,2
Row house	4,4	39,9
Other	3,7	0,7

* Data 2006. (CBS, 2010; Statistics Korea 2010)

The general quality of housing is difficult to compare between different countries. General quality in both countries has improved significantly in the last 50 years due to new legislations and the market demand for higher quality. The increase in size of dwellings and facilities is described by Ekkers (2006) and NSO (cited in Park, 2007, p. 96). One of the few comparable variables for housing quality is the number of rooms per dwelling, as visualised in table 2.9. The number of rooms has been increasing constantly in both areas but the most significant progression is made in the SMA. In Korea it used to be common to inhabit a dwelling with more than one household. Since the introduction of the 'one house per household policy' in 1981 this situation has changed and the number of rooms per household increased significantly as well (Park, 2007). Nowadays the number of households per dwelling in both areas is almost equal. Most dwellings in the SMA have 3 or 4 rooms. Due to the massive production of housing a high number of these units, mainly apartments units, are created which is reflected in their share of the total stock. The distribution of rooms per dwelling is more equal in the Randstad. Also, dwellings in the Randstad generally have four rooms or more.

Table 2.9: Rooms per dwelling in Seoul Metropolitan Area (SMA) and Randstad as % of total stock in 2005

	SMA	Randstad*
1 room	6,7	0
2 rooms	5,6	12,5
3 rooms	29,0	25,1
4 rooms	46,0	31,2
5 rooms	9,1	20,4
6 rooms or more	3,7	10,8

* Data 2006. (CBS, 2010; Statistics Korea 2010)

2.4.3 Market

The housing supply ratio shows to what extent the housing supply meets the quantitative housing demand represented by the number of total households. The historic supply ratios for the SMA and the Randstad were not available since most public historic data reflects the national supply and demand. In 2007 the supply ratio in the SMA was 96,9%, about 10% lower than the national average (MLTM, 2008). The housing supply ratio in the Randstad equals the national average and was 96,9%

in 2007 (CBS, 2010). Coincidentally, the supply ratio in both research areas are exactly the same. Historically the growth of the Korean housing stock is impressive but not enough to meet the rapid rising demand due to population growth, urbanisation and the growth of the number of households. Therefore the supply ratio declined until 1990. Then the housing production, driven by several large governmental plans, finally caught up with the increasing demand. The Dutch housing supply ratio has always been relatively high. This means the supply has kept up with the growing demand

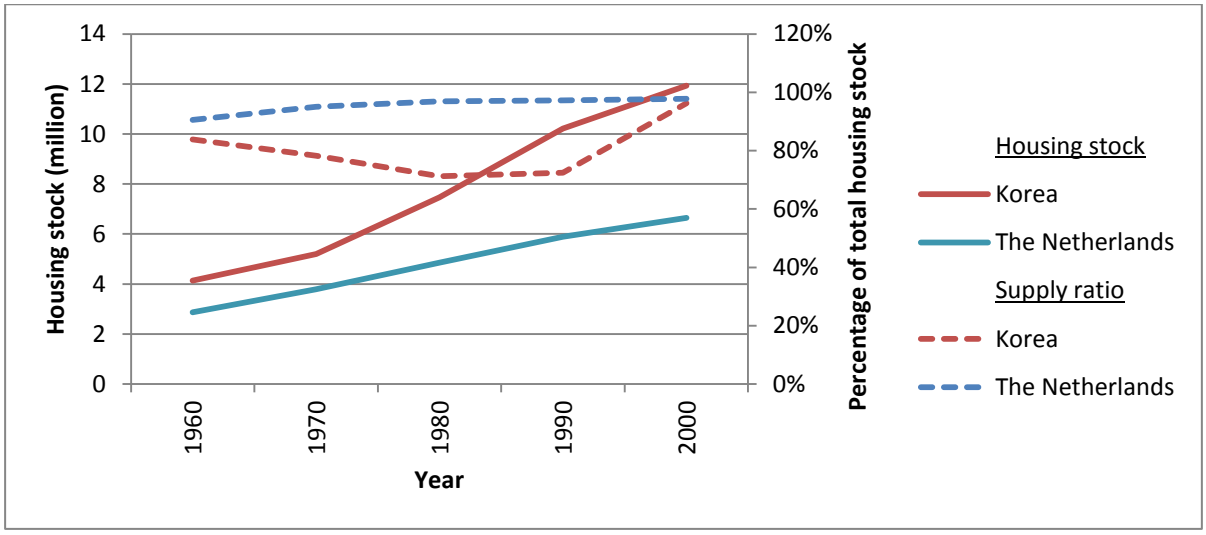


Figure 2.9 Housing stock per million and housing supply ratio of Korea and the Netherlands (Park, 2007; CBS, 2010)

The real house price, i.e. the average housing price index for all types of dwellings deflated by the consumer price index, of Korea and the Netherlands are mapped by the OECD (2010). The Korean price level doubled between 1974 and 1986, but it fluctuated around the same level between 1986 and 2009 and ended up about 10% lower (Hannah et al., 1993; OECD, 2010). Housing in Korea hereby became more affordable. Given the high pressure on the housing market in the SMA, a price increase in large parts of this area is likely (Hannah et al., 1993). The housing price in the Netherlands was relatively stable between 1974 and 1986 but has since then almost tripled (OECD, 2010). Housing in the Netherlands became significantly more expensive, let alone housing in the Randstad.

2.5 Conclusion

This chapter explored the comparability of the housing markets of the SMA and the Randstad on three levels to answer the first sub-question of this thesis: 'to what extent are the housing market of the Seoul Metropolitan Area and the Dutch Randstad area comparable?' Table 2.10 summarises the differences and table 2.11 the similarities described in this chapter that lead to the following conclusions:

- The current housing market of the SMA and the Randstad show many similarities. They are largely comparable but specific circumstances originate from different backgrounds.
- The rapid urbanisation and population growth put a significantly higher demographic pressure on the SMA. This is reflected in household and housing supply figures below.
- Because of the political structure and the top down organisation, strong policy changes are more feasible in the SMA than in the Randstad.
- To fulfil the housing demand, the Dutch government actively created a social renting sector, where the Korean government mainly used planning and fiscal instruments.

Table 2.10: Differences between Seoul Metropolitan Area (SMA) and the Randstad

Subject	SMA	Randstad
National trends		
Population density	1941.9 inh. per km^2	1051.5 inh. per km^2
Population growth (1950-2010)	+250%	+60%
Urbanisation level (1950-2010)	From 20% to 80%	From 55% to 80%
Executive political power	President	Prime minister of coalition
Governmental regulations		
Social housing	Very few programmes	Extensive programmes
Planning	Top down by government	Bottom up by market
Fiscal measures	Object subsidies	Subject subsidies
Tenure	Small rental sector	Large rental sector
Housing market		
Household increase (1960-2000)	+629%	+109%
Expected household increase	+50%	+15%
Housing supply	Booming increase	Steady increase
Row houses in total stock	4.4%	35.9%
Rooms per dwelling	Mainly 3 or 4	More equal distribution
Housing supply ratio (1960-2000)	First decrease, then increase	Constant high level

Table 2.11: Similarities between Seoul Metropolitan Area (SMA) and the Randstad

Subject	SMA	Randstad
National trends (countries)		
Human Development Index	0.877	0.890
Gross Domestic Product	929 billion US$	860 billion US$
Governmental regulations		
Planning	Active governmental role in 1970s and 1980s, governmental withdrawal in 1990s and 2000s	Active governmental role in 1970s and 1980s, governmental withdrawal in 1990s and 2000s
Housing market		

Gross National Income per capita (1980-2008)	Steady increase	Steady increase
Owner-occupied housing in total stock (counties)	54.2%	52.2%
Apartments in total stock	53.2%	46.2%

3. Theoretical framework on development speed

This chapter reviews the theoretical literature on the determinants of development speed in the housing market, which can be analysed on three levels. On a macro level the neoclassical theory is used to describe the economic mechanisms behind housing development speed. On a meso level the institutional theory is used to illustrate institutional forces on housing development speed. Finally, on a micro level the behavioural theory is used to explain the influences of individual behaviour on housing development speed. The conclusion, presented in the last paragraph, holds the answer to the second question of this thesis and the leading research question in this chapter: '*what determines the speed of the housing development?*'

3.1 Neoclassical approach

The neoclassical approach forms the heart of mainstream economics and is also commonly used in (economic) geography to describe general market principles. The theory assumes a free and efficient market in which rational economic choices are made; based on self-interest, profit maximisation and perfect information. This leads to market clearing, a balance between demand and supply, led by the invisible hand of predictable actors. Therefore, relationships between different variables are predictable.

3.1.1 Four quadrant model

DiPasquale and Wheaton (1992) introduce a four-quadrant model to describe the behaviour of real estate market. They divide the real estate market into two parts: an asset market where price and production are determined and a property market where stock and rent are determined. Both markets influence each other, changes on the property market influence the asset market and vice versa. Ceteris paribus, the model assumes a long-term equilibrium in which all endogenous parameters (rent, price, construction and stock) are in balance. Exogenous variables such as the income per capita, the number of households or the interest rate can influence the model. The four-quadrant model is visualised in figure 3.1, the left side represents the supply or asset market and the right side represents the demand or property market.

In the top right quadrant, the rent for real estate is determined. The rent level per unit of space is based on the given housing stock, which is fixed in the short run because of the relatively long development time of real estate, and a given demand curve. The number of households and the state of the economy determine the location of the demand curve. The slope of this curve can be explained by the market principle in which an oversupply leads to a lower price and an undersupply

leads to a higher price. Depending on the demand elasticity, the curve can be flatter or steeper. If the model is in equilibrium, the demand for space expressed by the rent level equals the stock of space. The rent level is the input for the valuation process in the top left quadrant. The price per unit for real estate assets is determined based on the given rent level from the top right quadrant and the demand to own real estate assets. The latter is expressed as the demanded yield by investors to hold real estate assets and is viewed as exogenous. A high demand to hold real estate assets is reflected by a low yield and vice versa. This depends on long-term interest rates, expected risk and rent development, and risk and tax policies on real estate. The bottom left quadrant determines the construction of new real estate assets given the price for real estate assets. The curve in this quadrant, representing the replacement cost of real estate, starts on the price axis because of a minimum price level needed for construction. Replacement costs are assumed to increase with construction rate due to various impediments to real estate development such as the availability of resources, which explains the direction of the curve. The exact slope depends on the elasticity of construction to price changes. The newly constructed real estate is the input for the stock adjustment in the last quadrant in the bottom right. Because of a constant nonnegative depreciation of the stock, expressed by the exogenous depreciation rate, a constant production of real estate is needed to keep the stock on the same level. The total stock is adjusted by simply adding new production and subtracting depreciated stock. If the stock outcome equals the starting stock, the model is in equilibrium and rent, price, construction and stock are at a constant level. If the stock outcome is lower than the starting stock, rent, price and construction have to increase to come to a new equilibrium. Vice versa, if the stock outcome is higher than the starting stock, rent, price and construction have to decrease to come to a new equilibrium.

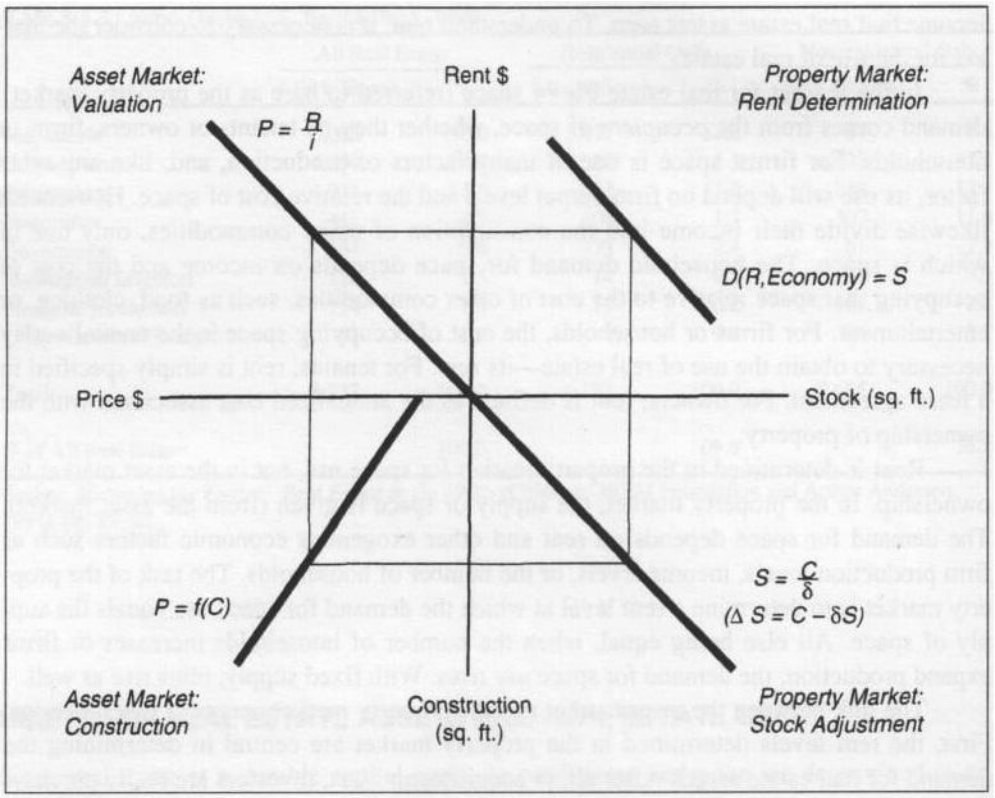
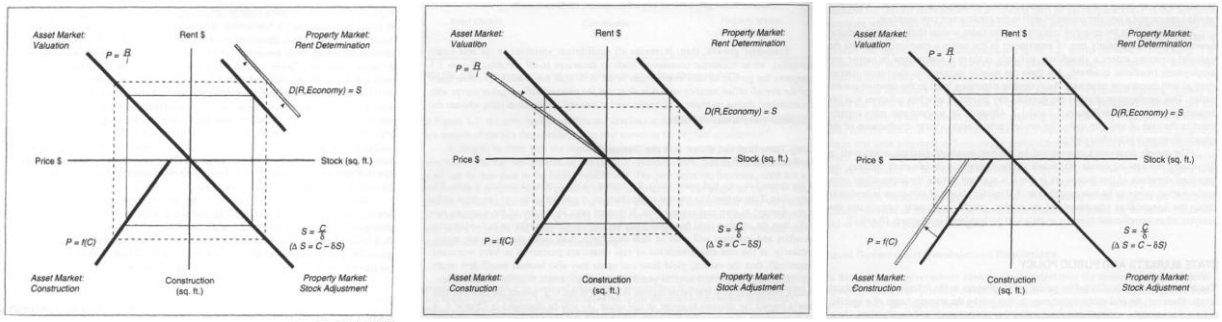


Figure 3.1: Four-quadrant model in equilibrium (DiPasquale and Wheaton, 1992)

Stock adjustments in the model above can take place because of changes in all four quadrants. This changes the theoretical long-term equilibrium into a new equilibrium with new constant levels of rent, price, construction and stock. The way changes in each quadrant affect the adjustment of the housing stock are described below. Since the housing stock is fixed in the short term, shifts in demand directly lead to a shift in rent level in the top right quadrant. Shifts in demand can be caused by changes of two variables that are both positively related to the demand: the number of households and the average income per capita. The first is built up from three factors: natural growth of the population, migration and development of the average household size. Assuming a single family housing ideal, a larger population, due to natural growth or migration, and a smaller average household size, lead to more households and therefore a higher housing demand. The latter is driven by the economic growth and tax policies. Economic growth and limited tax policies increase the income per capita, which leads to a higher average income and housing demand. An upward change in demand in the four-quadrant model is visualised in figure 3.2a. The demand curve rises and therefore the rent increases. On the asset market, this leads to a higher price and higher construction rate. The higher construction rate is reflected in a higher stock that eventually will meet the new demand in a new equilibrium. Logically, a downward change in demand would lead to the opposite of the situation described above. Changes in the top left quadrant depend on shifts in the required yield to hold real estate assets. This yield determines the slope of the curve in this quadrant

and has a negative relationship to the housing price: ceteris paribus a lower yield leads to a higher price. Three factors determine the yield, which all largely depend on the financial markets. Firstly, the yield is affected by cost of capital, which is determined by the long-term interest. A lower interest rate lowers the cost of capital and the required yield for real estate investments. This leads to a higher price for real estate. Secondly, expectations about future rent development and the risk involved in these expectations influence the yield. Positive expectations about future rents and low perceived risk, also lead to a lower yield and higher prices. Finally, taxation policies on residential real estate investments influence the required yield. Favourable tax policies lead to a lower yield and again to higher prices. Figure 3.2b shows the effects of a lower yield on the four-quadrant model. The lower yield leads to a flatter slope of the curve and a higher price. Consequently, the construction output and stock rise as well and the rent level decreases to form a new equilibrium. A higher yield, on the other hand, leads to a steeper slope and a lower price, construction and stock, and a higher rent. Construction costs variations cause the changes in the bottom right quadrant. Higher construction cost lead to a lower output. The construction cost can be divided into three categories. Firstly, the short-term interest rate determines the short-term cost of capital for construction. Lower interest on the short term, lowers the construction rate and raises construction output. Secondly, construction costs depend on the cost of resources. These costs can be subdivided into cost for land and cost for other (building) resources. Thirdly, the cost of labour also influence construction costs. Again, lower costs lead to a higher construction output. The effects of changes in construction costs are visualised in figure 3.2c. When costs rise the curve moves to the left making construction more expensive. All other things equal, this leads to lower construction rates and consequently to a lower stock, a higher rent and a higher price. Lower construction cost lead to the opposite. In the bottom right quadrant changes occur due to changes in the depreciation rate of housing. The rate of depreciation depends on the technical quality and the subjectively perceived locational and technical quality of the stock. In general, a lower (perceived) quality leads to higher depreciation and to a steeper curve. Ceteris paribus, this leads to a smaller stock and higher rent, price as well as construction. A higher (perceived) quality logically leads to a flatter curve and a higher stock with lower rent, price and construction.



a) increasing demand b) declining yield c) rising construction costs

Figure 3.2: Four-quadrant model in change (DiPasquale and Wheaton, 1992)

3.1.2 Stock flow model

The described changes within the four-quadrant model, lead the model from one static long-term equilibrium to another. The dynamics on the property market determine the speed of the housing stock adjustment to a new situation and hereby rapidness of housing development. DiPasquale and Wheaton (1996) incorporate the variables that affect the size of the housing stock, including a time variable, in a stock flow model to describe the short-term dynamic development of changes between static equilibriums. In this stock flow model for highly durable goods, price adjusts quickly to a demand shift but the stock adjusts only slowly to meet the new demand. The latter happens because of the relatively long production time of real estate. DiPasquale and Wheaton come to the following equations for short-term dynamics on the housing market:

(3.1) $\text{Demand}_t = H_t (\alpha_0 - \alpha_1 U_t)$

α_0 = Rate of home owning preference (for home owning cost 0)

α_1 = Responsiveness of α_0 to changes in home owning cost

H_t = Number of households

U_t = Annual cost of home owning

The demand for housing is expressed by the number of households, H_t, multiplied by a parameter for home owning preference. The latter consists of the responsiveness of homeowner preference, α_1, multiplied by the annual cost of homeownership U_t and subtracted from the rate of home owning preference if cost were zero, α_0. The annual cost of home owning, U_t, is given by equation 3.2:

(3.2) $U_t = P_t (M_t - I_t)$

I_t = Expected rate of future house price appreciation

M_t = After tax mortgage rate

P_t = Current rent price level

U_t is calculated by multiplying the current rent price level by a parameter for the cost of capital given by the after tax mortgage rate, M_t, minus the expected rate of future house price appreciation I_t. The stock-flow model assumes prices to quickly adapt to demand shifts so that $Demand_t$ from equation 3.1 is equal to the current stock S_t. The assumption that $Demand_t = S_t$ leads to the following equation for the current price of housing:

$$(3.3)\ Price_t = \frac{(\alpha_0 - S_t / H_t)}{\alpha_1 (M_t - I_t)}$$

S_t = Housing stock

The price of housing is determined as follows. The topside of the equation represents a parameter for the pressure on the housing market. This parameter is calculated by subtracting the size of the current housing stock, S_t, divided by the number of households, H_t, from the rate of home owning preference, α_0. Hereby the number of households is an indicator for housing demand. The outcome of the topside of the equation is divided by a parameter for housing cost on the bottom side of the equation. This parameter is calculated by multiplying the responsiveness of homeowner preference, α_1, by the cost of homeownership. The latter is calculated by subtracting the benefits of homeownership, the expected rate of future house price appreciation, I_t, from the cost of homeownership, the after tax mortgage rate, M_t. All other circumstances being equal, high preference of homeownership or a small ratio of stock to household lead to a higher price. Low responsiveness to changes in home owning cost, high after-tax mortgage rates and low expected future house price appreciation also lead to a higher price. Price changes lead to changes in the housing stock, which are determined as follows:

$$(3.4)\ Stock_t = S_{t-1} + \tau(-\beta_0 + \beta_1 P_{t-1} - S_{t-1}) - \delta S_{t-1} \quad \text{if } -\beta_0 + \beta_1 P_{t-1} \geq S_{t-1}$$

$$(3.4)\ Stock_t = S_{t-1} - \delta S_{t-1} \quad \text{if } -\beta_0 + \beta_1 P_{t-1} < S_{t-1}$$

β_0 = Minimal cost of land and construction

β_1 = Responsiveness of supply to price changes

δ = Rate of housing demolition and scrappage

P_{t-1} = Housing price in last period

S_{t-1} = Housing stock in last period

τ = Stock adjustment rate

Two equations determine the housing stock. The first equation can be divided into three pieces. The size of the housing stock is calculated by firstly taking the housing stock in last period, S_{t-1}, then adding the housing construction in last period, $\tau (-\beta_0 + \beta_1 P_{t-1} - S_{t-1})$, and finally subtracting demolished and scrapped housing in last period, δS_{t-1}. Housing construction is determined by multiplying the stock adjustment rate or responsiveness of construction, τ, by the net construction $(-\beta_0 + \beta_1 P_{t-1} - S_{t-1})$. This construction is calculated by subtracting the stock in the last period, S_{t-1}, from the total stock in the long run $(-\beta_0 + \beta_1 P_{t-1})$. The latter consists of the negative minimal cost of land and construction, $-\beta_0$, plus supply revenues given by the responsiveness of supply to price changes, β_1, multiplied by the price in the last period, P_{t-1}. If this total stock on the long run is smaller than the stock in the last period, the first formula leads to a negative construction rate, which is not possible. In that case the second equation shows how the housing is calculated when no housing construction occurs. Then the housing stock is simply determined by subtracting demolished and scrapped housing in last period from the housing stock in last period. All else being equal, a higher stock is initiated by a higher stock adjustment ratio, lower minimal cost of land and construction, higher responsiveness to price changes, a higher price or a lower rate of demolition and scrappage.

Changes in variables or factors in the equations mentioned above eventually lead to a steady balance between price and stock: a higher price leads to a higher stock, but this higher stock subsequently leads to a lower price. The steady state occurs when supply and demand meet and the stock is in a steady state, which means that S_t equals S_{t-1}. Before the new long-term equilibrium of price and stock is reached both variables will have to adapt to this new equilibrium. DiPasquale and Wheaton describe several ways of adaption dependent on the way future price expectations are made. The following example assumes that price expectations are not influenced by price behaviour in the housing market but only by the general market circumstances. When a positive demand shock occurs, price rise instantly since there is no immediate supply of housing. Construction follows this price increase and, because of the lagged and gradual stock adjustment, slowly increases the stock. This leads to a gradually declining price and construction level that eventually is only slightly higher in the new steady state than it was in the old steady state. The process of price and stock adaption is visualised in figure 3.3.

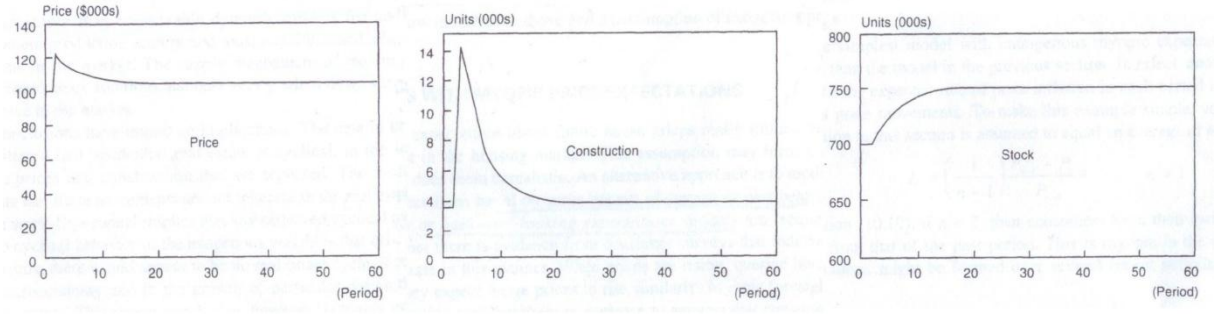


Figure 3.3: Market adaption to positive demand shock under exogenous expectations (DiPasquale and Wheaton, 1996)

3.1.3 Supply response

According to a neoclassical approach, the speed of adaption to a new equilibrium, or the rapidness of housing development, depends on two endogenous factors that influence the height of the price shock and the speed of stock adaption. The height of the price shock is determined by the responsiveness of home owning preference to changes in home owning cost, α_1, in the formula for price determination. This variable determines the magnitude of the price shock, irrelevant to changes in other variables. A higher responsiveness leads to a higher price shock and higher housing construction according to the formula for stock determination. The speed of stock adaption is determined by the responsiveness of the supply to price changes, β_1, and the stock adjustment rate, τ, in the formula for stock determination. A high responsiveness and a high adjustment rate lead to a higher construction rate and a more rapid adaption to a new equilibrium. In practice the relation between price and supply is often measured as supply elasticity.

3.2 Institutional approach

Institutions are defined by Martin (2005) as both formal and informal structures of political, social and economic rules, procedures and conventions. They are created by human society to reduce frictions and uncertainties on the (housing) market (Eggertsson, 1990). Hereby institutions limit the theoretical efficiency of the free market and alter development speed as described by the neoclassical approach. Therefore housing market dynamics cannot solely be explained by economically rational behaviour and market efficiency without considering institutions that influence housing market behaviour.

3.2.1 Institutional hierarchy

Keogh and D'Arcy (1999) describe the property market as an institution. This is visualised in the middle block of the institutional hierarchy of property markets in figure 3.4. Rather than one unified entity, this is a "network of rules, conventions and relationships" that forms the institutional system of the property market in every country. This system is based on market and non-market activities on the property market, the decentralised and informal nature of the property market, such as local or informal regulations, the legal framework, such as land and property laws, and market conventions such as codes of conduct. The property market as an institution is shaped by interactions on two levels. On a higher level the broader institutional environment poses political, social, economic and legal forces on the property market. On a lower level the organisations within the property market interacts with the property market as an institution. The relation between the three levels is interactive. For example, property market organisations are neither blind follower of institutions nor fully autonomous actors; they rather act trough property market institutions (Amin, 2001).

Figure 3.4: Institutional hierarchy of property markets (Keogh and D'Arcy, 1999)

Institutions are not only influenced and changed by interactions with other institutional levels. Gavirina (2001) states that these interactions can create conditions under which institutions change but that this change is reinforced endogenously over time. Therefore institutions cannot be seen as a given; they also autonomously change from within. Since the property market as an institution is

shaped by various stakeholders with different interests and different powers to shape institutions and by endogenous changes, institutions do not necessarily represent a general interest nor a maximum market efficiency. Keogh and D'Arcy (1999) mention bounded market efficiency by institutions and Amin (2001) states that "economy is an instituted process". Property market institutions change the efficient free market mechanisms and can influence housing development speed.

3.2.2 Institutional interventions

To analyse the impact of the institutional setting on housing development speed, the property market for housing is divided into formal and informal institutions that intervene in the housing market. In a formal way governments, influenced by political, social, economic and legal forces, determine the rules and regulations of the housing market. In an informal way society develops routines based on cultural values that influence the housing market (Martin, 2005). Formal institutional interventions on the housing market are carried out by governments to "override markets or steer market forces to achieve desired political aims" (Ball, 1998). By implementing public policies, political institutions tend to serve the general interest of its population. The reason for governmental intervention on the housing market is a presumed market failure if no interventions were carried out. Kivell (1993) describes the four most important reasons for market failure. Firstly, if land is not used optimally because its supply is too random and unpredictable to come to an optimal equilibrium. Secondly, if in a price driven market, the distribution of public facilities is under pressure. Thirdly, if inequalities between rich and poor are not resolved. Finally, if negative agglomeration effects are not dealt with properly. These reasons stimulate governments to intervene in the land and property market and consequently in the housing market. The extent of these interventions partly depends on the political orientation of the administration in power. Esping-Anderson (1990) describes that the (Western and thus Dutch) approach towards governmental interventions arises from welfare state politics. These motives are based on social democratic, corporatist or liberal views of taking care of that part of the population that cannot afford proper housing. In general, left wing oriented administrations tend to bound free market development in the housing market more than right wing oriented administrations (Anderson, 1990). Park (2007) adds a new Asian approach to governmental intervention on the housing market. He states that Asian intervention has not been driven by a political motive of equality but rather by an economic motive. The Asian countries, including Korea, used housing policies to stimulate their economies by facilitating cheap (owner-occupied) housing for their labour force. The regulatory framework is

constructed on a national or regional government. The execution is therefore the responsibility of the regional or local level.

Kivell (1993) distinguishes three ways of governmental intervention: public ownership, regulatory measures and fiscal measures. Public ownership of housing is mostly realised by social housing programmes that create a minimum standard of housing. This takes place either through directly financed governmental organisations or through subsidised semi-governmental organisations. These political institutions offer decent and affordable housing to those who cannot afford proper housing on the regular housing market. In this way, the housing production is initially higher than the economically rational production. This does not directly influence housing development speed but governments hereby do change free market price mechanisms. In the Netherlands housing corporations built a significant part of the total housing stock. As opposed to Western welfare states, most Asian states cannot afford to provide standard housing for the part of the population that cannot afford proper housing. Therefore, most Asian countries were more dependant of regulatory and financial measures to influence housing supply. These countries only recently started programmes for public ownership in the housing market (Park, 2007). Governments can use an array of regulatory measures to guarantee specific desired properties of the built environment. These measures can be divided into land and object regulations, both formalised in legal institutions. The most common land regulating measure is the zoning of land. In this way the government can determine the type of land use to come to a favourable mix of land use in an area and prevent unwanted nuisance. The restrictiveness of land zoning can vary from country to country but the land planning instruments in most Western countries are quite comprehensive (Barker, 2004) and often restrictive to new greenfield developments. Korea knows these strict land policies as well (Bengston and Youn, 2005). Such land regulations not only limit space for housing development but also often impose time consuming procedures to obtain building permits. This increases the time consumption of a project and thus negatively affects the housing stock adaption speed. Regulations on objects often also have a negative impact on stock adaption speed since these regulations entail extra work on a project and also procedures to check if regulations are followed. Basic regulations on building height and technical safety are common, but some counties also impose regulations on durability and architecture. The intensity of this planning instrument depends on a nation's planning culture. Fiscal measures can be divided into three categories (Kivell, 1993). Firstly, general taxation of land and property. Secondly, taxation on profit from land development, generally obtained when selling property. These two measures are mostly put into place for their general financial benefits. Thirdly, subsidies to stimulate desired developments or behaviour. These subsidies can affect the object, like public housing, or the subject, the tenant of the property, for example by tax deductibility of

mortgage interest. All fiscal measures directly influence the income per capita, thus housing demand: taxation in a negative way and subsidies in a positive way. Fiscal measures do not directly influence housing development speed but they underline the important role of the government in influencing housing demand.

Interventions from informal institutions are not government-lead. They arise from routines a society develops that form the foundation of the way organisations within the housing market act and interact. According to Hodgson (1997) these automatisms all have the same general form: "in circumstances x, action y follows". He describes seven reasons why these routines are beneficial in rational behaviour:

1. *Optimisation*: where the choice set is known and it is possible to employ procedures and decision-rules to find an optimum.
2. *Extensiveness*: where the information may be readily accessible and comprehensible but the search for it requires the application of substantial time and other resources.
3. *Complexity*: where there is a gap between the complexity of the decision environment and the analytical and computational capacity of the agent.
4. *Uncertainty*, where crucial information and probabilities in regard to future events are essentially unobtainable.
5. *Cognition*: the general problem of dealing with and interpreting sense data.
6. *Learning*: the general process of acquiring crucial knowledge about the world.
7. *Communication*: the general need to communicate regularly with other.

Figure 3.5: Reasons for routines (Hodgson, 1997)

These routines have different forms like rules, norms and habits that intervene in the housing market. The distinction between rules, norms and habits lies in the awareness of them when applied (Hodgson, 1997). Rules are applied consciously, norms are generally accepted rules within a society and are applied almost automatically and habits are automatisms that are applied automatically and unconsciously. When widely accepted and applied rules can eventually transform into a habit. For example, the rule of having an empty space underneath Dutch houses, enabling ventilation for the wooden floors to prevent it from growing moldy, has become an unconscious habit nowadays. Even though almost no new buildings have wooden floors, the empty space is still constructed under new buildings, not serving any obvious purpose anymore. If widely accepted, formal governmental institutions can institutionalise these informal values. The informal institutional automatisms are founded upon a societies' cultural values, described in the next paragraph, and thus are locally

specific. Keogh and D'Arcy (1999) state it is not easy to pin down these informal institutions since they are mostly not officially institutionalised. They do however give some examples such as expected business models based on tradition and practice, and social attitudes that determine the symbolic value of property ownership or property rights. Martin (2005) adds corporate behaviour, consumption culture, work practices and transaction norms such as informal market interventions. For example, the value of homeownership and housing preferences, like preferred size and type of facilities, are partly culturally determined. But also and the division of authority, trust, the operations of and interaction between institutions influence the speed of the housing development process.

3.2.3 Supply response

The impact of formal institutions on housing development speed is twofold. If consistent, governmental interventions stabilize the housing market by providing a legal and regulatory framework that reduces market uncertainties. Hereby investments in the market are relatively safe, which enables a more rapid housing development. On the other hand, these laws and regulations also slow down the housing development process by creating barriers for many aspects of housing development. Given the fact that these tendencies are in place, the political orientation of government in power only marginally strengthens or weakens them. Especially since political directions change relatively often and most laws and regulations are legally fixed for a longer period of time. The three ways of governmental intervention described above each influence the housing stock adaption speed in their own way. Public ownership does not directly affect the housing development speed. It only increases the size of the housing market since lower incomes groups are also included. If public ownership is used as an anti-cyclical investment method, it indirectly increases the housing stock adaption speed because housing developers can risk a higher minimum building capacity. Regulatory measures create a regulatory basis that partly excludes uncertainty from the housing market. Many regulations are focussed on creating a durable society by ensuring proper infrastructure and mixed zoning. This ensures the long-term value of property and lowers the investment barrier for the housing market, increasing the housing stock adaption speed. On the other hand, regulatory measures also function as artificial boundaries that slow down housing development, for example by time consuming building permit procedures and object regulations. This is reflected in most literature on regulatory measures (Hwang and Quigley, 2006; Mayo and Sheppard, 1996; Meen, 2005). Fiscal measures effect the housing stock adaption speed more straight forward through the income per capita and consequently housing demand; taxes in a negative way, subsidies in a positive way. Housing development speed is indirectly influenced if housing demand is consistently increased or decreased by fiscal measures changing developers' building capacity.

Informal institutions also affect housing development speed positively and negatively. They are a practical interpretation of the reasons for routines described by Hodgson (1997) in figure 3.5, for example to reduce complexity and uncertainty or to improve communication. Industry representative organisations, codes of conduct and fixed working ethics are all examples of these informal institutional solutions. These informal routines create a standardised market and production process. In this way housing development speed is positively affected by informal institutions. However, these automatisms only slowly adapt to new (economic) developments, especially unconsciously applied habits. In this way informal institutions act as a brake on the speed of housing development, for example if routines are not as effective as routines elsewhere.

3.3 Behavioural approach

The behavioural school puts the individual behaviour first in explaining market forces. This adds a micro perspective to the more generic models from the neo-classical and institutional approaches discussed above. According to the behavioural approach, the individual is not always well informed and makes decisions based on insufficient information and on his own interpretation of this insufficient information (De Pater and Van der Wusten, 1996). This complex decision-making process is based upon the way the human brain functions, leading to different market behaviour that can only be explained by looking at individual decision-making. Therefore, instead of a rational homo economicus, the behavioural approach beliefs in a homo psychologicus. Compared to the institutional approach, in which individuals consciously or unconsciously act together, the behavioural approach looks into the individual opinion making process that precedes the formation of (new) institutions. However, existing institutions also influence this opinion making process, making both approaches interdependent (Schmid, 2004).

3.3.1 Cognitive factors

Human behaviour is determined by the functioning of the brain. Schmid (2004) and Strauss (2008) review the influence of cognitive factors on economic decision-making. They distinguishes four aspects that influence decision-making:

1. Bounded rationality
2. Emotions and evaluation
3. Behavioural regularities
4. Learning

Firstly, the human brain is bounded in its rationality. This is based on the fact that the brain is modular and has a limited capacity. The brain consists of two modules: a rational planner part and an impulsive action part. Both parts, planner and action/instinct, play an important role in human evolution. The two modules are connected but have their own independent impact on behaviour. To describe the different roles of the modular brain Schmid (2004) uses the example of Ulysses rationally tying himself to his ship, to prevent himself from impulsively going after the Sirens and wrecking his ship. The impact of both parts of the brain on behaviour is not necessarily consistent; people can be "multiple selves" and can have changing preferences in time. The other reason for bounded rationality is a limited capacity of the brain. Because of this limited capacity not all variables in economic decision-making can be considered, even if all variables were available. This does not mean humans are irrational but rather act as rational as possible. Humans therefore have to use mental shortcuts to simplify every day decision-making. An array of different shortcuts can be distinguished. Choice can be consciously simplified by creating "mental accounts" or budgets for specific spending, by only deciding based on the most important features, and by creating more tangible sub goals and satisfiers to make the final goal less abstract. Less conscious, choice is simplified by using personally developed habits and procedures to act in certain situations, by using selective perception to exclude noise and attribute importance, and by subconscious satisfying not based on the optimal opportunity but on an adequate opportunity. On top of this, humans also try to simplify decision-making by calculating an optimal or maximum outcome based on all conscious and less conscious ways of simplification mentioned above (Schmid, 2004). All of these shortcuts are individually applied, based upon one's personal preferences or background and perception of reality, possibly enforced by cognitive dissonance. Therefore, the limited capacity is likely to lead to different outcomes of behaviour for different individuals in the same situation.

Secondly, Schmid (2004) states that utility is not the main driver of (economic) decision-making but that people rather think according to an evolving emotional dimension. Emotions are a part of human nature, and are involved in every decision-making process. One always has a feeling about a decision, consciously or unconsciously. There are many emotions that influence decision-making, Elster (1998) distinguishes "anger, hatred, guilt, shame, pride, liking, regret, joy, grief, envy, malice, indignation, jealousy, contempt, disgust, fear and love." These emotions can all be divided along a good-bad axis, or comparable right-wrong or pleasure-pain axes, on which people base their decisions. Emotions are not generally commensurable, so individual interpretation or comparison of these emotions leads to behaviour that is different for every individual (Schmid, 2004). Emotions evolve and change over time. Stacked up on top of each other in time, they gain meaning. By the process of evaluation the interpretation or feeling of emotions can change. In the long term, people

can develop emotional preferences or patterns that emotionally biases behaviour. This means that seemingly irrational economic behaviour can rationally be explained by emotions. It might be the most rational choice considered one's changed preferences due to emotions. According to the behavioural approach, preferences are not prefixed but rather formed along the way (Schmid, 2004).

Thirdly, many behavioural regularities influence decision-making. Unlike the mental shortcuts mentioned above, these automatisms are unconsciously applied. This lead to behaviour that is contradictory to neoclassical theories. Some regularities are related to the limited capacity or modularity of the brain that bound rationality, the origin of others is unclear. They are not always applied but true in most instances (Schmid, 2004).

Limited brain capacity

- **Availability**: recent memorable or vivid experiences often overrule better sources of information.
- **Anchoring**: Estimation are done using a base estimate, true or false, and adjusting this only slightly to other variables. Instead of absolute values, context dependent relative (anchored) values are used.
- **Memory**: Evaluation based on highlights and end evaluation. These are not truly representative moments.

Brain modularity

- **Losing**: Losing is disproportionally worse than winning. This leads to risk aversion. Losing by own action is perceived worse than losing by doing nothing, while the actual loss is the same. And psychology of risk leads to a-mathematical risk taking.
- **Over focus**: People are insensitive to statistics and base rates in favour of own plans and desires.
- **Future**: Importance of future aspects of life is exaggerated. People have an over focus on distinctive aspects of a good future.
- **Time**: Preferences are time variant, not time consistent. Short-term preferences give immediate gratification and are more easily chosen over long-term preferences.
- **Sunk cost**: Sunk cost should not play are role in decision-making since they are worth nothing. Still they play a role since it is psychologically difficult to forget past decisions and admit mistakes.
- **Surprise**: Humans seek surprise and avoidance of boredom, for example hobbies. This cannot be expressed according to economic rational behaviour.

Other

- **Perception**: The perception of differences depends on the magnitude of the original. The same absolute price change is perceived to be worth more for lower sums.
- **Hypothesis**: People stick to their hypothesis of plans, paying less attention to other options. Again it is difficult to forget past decisions and admit mistakes.
- **Regard**: People are sensitive to norms and moral judgement because they want to belong and be part of a group. Therefore they can show unselfish behaviour.
- **Fairness**: Firms are expected to act according to fair and moral behaviour (Kahneman et al., 1986). They do have to share gains. Firms should not impose loss on others to gain itself with the exception to safe itself.
- **Satisfaction**: When one reaches a point of satisfaction, opportunity costs are neglected.
- **Framing**: The way choices are presented matters. All choices are subject to framing which leads to a certain interpretation. One always wants to ratify a choice, and framing can provide reason for this, even if it is artificial.

Fourthly, behaviour changes because of constant learning. In this way humans try to make sense of the world in a constant flow of stimuli. Skinner (1971) introduced the stimulus-behaviour-reinforcement model to describe the learning process. Anything can be a stimulus; hunger, price change or change in market share. People act upon this stimulus with specific behaviour. Dependent of its outcome this behaviour is altered or reinforced, this is understood as learning. Hereby positive reinforcement is the most effective way to stimulate behaviour, the effects of negative reinforcement, for example disapproval or fines, are far less. Belief persistence is an important pitfall in the learning process. People tend to be overconfident in their own beliefs and too modest in the contrary. Perceiving correlations is not something humans are good at. Also adaption to other behaviour is underestimated, it is difficult to move away from old behaviour. There is often no room for conscious calculation when acting in a complex world. Humans leap to action using cues and patterns. In this way humans get an imprecise but quick unconscious confirmation of their choice. This is either done by comparison with things with similar characteristics or biographical reference based on the producer of a good, not the product itself. This underlines the fact that behaviour is no calculated response but an emotional, intuitive and creative process with many shortcuts and regularities to fulfil ones preferences. Therefore there is no optimal economic equilibrium but rather an evolved equilibrium that is one of many possibilities.

3.3.2 Impact on the housing market

The impact of the behavioural approach on a micro level is best explained related to the neoclassical and institutional approach on a macro and meso level. These are the frameworks on which the behavioural theory has an impact. The neoclassical assumption of complete economic rational behaviour is altered by behavioural theory. There still is economic rationality, it is only not as straightforward as neoclassical theory assumes. Other considerations beside economic reasons have to be taken into account. People can be multiple selves, use mental shortcuts, are led by emotions, behave according to non-economic regularities and have changing preferences (Schmid, 2004). For example, people do not always strive for maximisation of personal utility, as altruism and cooperation also play a role (Mitchell and Utkus, 2004). Furthermore, when looking at happiness in the western world, the most important factors are of non-economic nature (Schmid, 2004). To predict outcomes of economic decision-making processes many more, incommensurable, variables have to be taken into consideration. On top of this, every individual has different motives and makes own decisions on the housing market. One has to look at the individual to completely understand specific behaviour. This increases uncertainty of market processes; multiple outcomes are possible. For example, correlations may not be as linear as assumed because of various behavioural reasons. The responsiveness of home ownership preference to changes in home ownership cost, can be lowered by satisfaction of home owners, of increased by a positive public debate about housing development. The behavioural theory helps to better understand anomalies that can occur. Institutions are interconnected to behaviour. A clear demarcation between informal institutions and mainstream behaviour is absent. When behaviour is ubiquitous, it is de facto an informal institution. Formal institutions and behaviour stand further apart from each other. Behaviour is subject to formal institutions, but given the behavioural characteristics described above, they are not fully efficient. Strauss (2008) states that political ideology usually acts by the neoclassical approach of economic rationality and utility maximisation to influence housing market behaviour. This is a mismatch with behavioural theory and therefore might not or less quickly achieve its objectives. For example, economic rationally planned housing programmes that do not appeal to the emotional needs of users, might not flourish. Another mismatch between the institutional approach and behavioural theory lies in the fact that public policy is usually based on forward-looking policies, which involve calculation of future advantages. According to behavioural theory, humans are not very good at calculating future benefits, and learn better trough past evaluation. In addition, public policy is often based on negative reinforcement such as taxes and penalties, while positive reinforcement has a much larger impact according to the behavioural approach (Schimid, 2004). The effectiveness of the institutional approach is limited by behavioural characteristics. This does not make institutions completely ineffective; it might be the best achievable option.

3.3.3 Supply response

The behavioural approach influences the neoclassical and institutional impact on supply response, increasing uncertainty for the first and reducing effectiveness of the latter. This is based on individual behaviour, which is not straightforward and should be considered from case to case to explain anomalies. There are however some general behaviour tendencies that impact supply response. People are not good at adapting to new insights. They act according to fixed patterns like behavioural regularities and mental shortcuts and find it difficult to change opinions and preferences. In general, people learn slowly (Prast, 2004). This functions as a shock absorbing mechanism for changes in supply response. Hereby changes in supply response are delayed. For example, by psychologically sticking to old prices when price dynamics change (Prast, 2004) or by sticking to consuming after bad income news (Camerer, 2000). On the other hand, people are not good in calculating future benefits and tend to be overconfident in the path they choose. This leads to longer consistent behaviour but also possibly to overreactions like hypes and panic (Prast, 2004). Real estate bubbles are a striking example of overconfidence. Overall, because of behavioural characteristics, changes in supply response will take more time, but when a tipping point is reached, they take place more rapidly neoclassical theory would assume. The pattern of changes becomes delayed and spikier. The absolute level of supply response depends on these trends, positive and negative trends will become stronger.

3.4 Conclusion

This chapter created a theoretical framework to analyse what determines the speed of the housing development on three levels. On a macro level the four-quadrant model and the stock flow model describe the relation of different variables in the real estate market for the long and short term. This generates insight to the general market principles. The institutional approach provides a useful complement on the meso level influences on housing development. On this level, institutions stabilise the housing market by reducing market uncertainties but at the same time bound market behaviour. This leads to a different market outcome and housing development. On a micro level the behavioural approach shows the important context of the individual in decision-making. It explains a lagged reaction on changes in the housing market and an overreaction when changes become behaviourally apparent. In total, all three theories are interconnected. The neoclassical theory directly impacts formal and informal institutions and behavioural theory. Formal and informal institutions internally interact and directly influence the other two theories. Finally, behavioural theory influences institutions directly and neoclassical theory through the body of institutions. This is

because behaviour only influences neoclassical theory if it is institutionalised. When looking at the explanations for the rapid housing development in the SMA in the next paragraph the interconnectedness of these three playing fields should be taken into account.

4. Rapid housing development in practice

This chapter applies the findings from chapter 2 and the theoretical framework from chapter 3 to explore the differences in development speed between the SMA and the Randstad. Combined with expert interviews (appendix 7.3) and fieldwork, several hypotheses are developed to answer the third question of this thesis: '*What explains the rapid housing development in the Seoul Metropolitan Area?*'

4.1 Expert interviews

The research on rapid housing development in the SMA in this chapter relies on interviews with experts on the Korean housing market supplemented with fieldwork. Expert interviews are chosen as main research method because they are most suitable to give content and meaning to the research subject in the explorative phase of this research. Compared to quantitative research this qualitative method enables quick information gathering on different topics within the research subject. Participants are often willing to participate since the subject is their field of interest. A downside of the chosen method is that the interviews do not need to be objective per se. All interviewed parties represent various formal and informal institutions and can be biased towards these institutions. Therefore the interviews are no simple information gathering session or perfect factual basis. The outcomes should therefore be weighed carefully (Bogner et al., 2009). Based on the interviews, hypotheses on the explanations of the rapid housing development in the SMA can be formed. Even though these hypotheses shed light on the housing development in the SMA, they need be more thoroughly tested in further research. To come to a complete picture of explanations, three groups of stakeholders with specific knowledge on the research subject were interviewed. Within each group at least three different parties have been interviewed to come to a balanced result for the group. Firstly, three governmental institutions in charge of housing development were interviewed: on the national level the Ministry of Land, Transportation and Maritime affairs (MLTM) and the Land and Housing corporation (LH) and on a local level the Seoul metropolitan SH corporation (SH). Secondly, four private parties involved in real estate development in the SMA were interviewed: three international companies (ING Real Estate, Jones Lang LaSalle and Maxmakers) and one national based company (Hyundai Development Company). Finally, three research institutions involved in real estate market research in the SMA have been interviewed to form a more independent judgement on the results of the first two groups: the European Union Chamber of Commerce (EUCC), the Seoul Development Institute (SDI) and Hanyang University. All interviews were conducted in Seoul in the period June to July 2010. The interviewing was done in person, in a semi-structured way based on the topics of chapter 2 and 3.

4.2 Market clearance

According to the neoclassical four-quadrant model and the stock flow model, the adjustment rate of the housing stock to a higher demand depends four factors: the size of the demand shock, the magnitude of the price shock, construction cost and the speed of the stock adaption. Considering the demand shock, the increase of the number of households in the SMA was six times larger than in the Randstad between 1960 and 2000. According to the stock-flow model, this leads to a higher housing demand in the SMA and higher housing prices in the short run. Following the four-quadrant model, the housing supply would then increase more in the SMA than the Randstad because of the higher price. But whilst the stock in the SMA indeed increased at a higher level during this period, the increase in real housing price in Korea was lower than the increase in the Netherlands. An explanation for the malfunction of the price mechanism can be found in the governmental interventions, such as price caps and large-scale building projects that significantly increased housing stock in the SMA. The responsiveness of the supply to price changes, the elasticity of the supply, is extensively mapped (see table 4.1 for an overview). Malpezzi and Mayo (1997) studied the supply elasticity in Korea. Their results show an inelastic Korean housing supply elasticity of 0 to 0,17 between 1970 and 1986. It can be assumed that this rate did not change significantly after 1986 considering the continuous restrictive planning policy in Korea, for example on land. The supply elasticity on the Dutch housing market was even lower. Vermeulen and Rouwendal (2007) conclude that the supply elasticity in the Netherlands was 0,10 between 1970 and 2005.

Table 4.1 Estimates of supply elasticity in various countries

Area	Period	Supply elasticity	Authors
China (35 cities)	1988 - 2008	0,79 - 1,58	Wang et al. (2010)
Hong Kong	1988 - 2004	0	Hui and Ho (2003)
Korea	1970 - 1986	0 - 0,17	Malpezzi and Mayo (1997)
The Netherlands	1970 - 2005	0,1	Vermeulen and Rouwendal (2007)
U.K.	1973 - 2002	0,0 - 0,84	Meen (2005)
U.S.	1950 - 1994	1,6 - 3,7	Blackley (1999)

(Phang et al., 2010; Vermeulen and Rouwendal, 2007)

Apparently, in both countries price changes only marginally influence housing production. This can be attributed to restrictive governmental planning policies in both cases. The government in both countries largely controls the supply of new land for housing development, causing the large scale housing production to rely on governmental incentives (Meen, 2005). Hereby the government also controls a large part of housing construction costs. Mayo and Sheppard (1996) and Hwang and

Quigley (2006) show that these restrictions limit the market response to a higher demand. In a growing housing market, such as the SMA and the Randstad, this only leads to a higher rent as is described by Glaeser et al. (2005; 2006). In terms of the stock flow model, restrictive land policies lead to a low responsiveness of the supply to price changes, β1, which lowers the effect of higher prices on construction rates. The fact that higher demand leads to lower real housing prices and the low supply inelasticity in the SMA and the Randstad, brings forth the following hypothesis to explain the rapid housing development in the SMA:

Hypothesis 1: Governmental interventions prevent fast market clearance.

4.3 Political importance and organisation

Housing became an important political issue during Korea's economic development path. The enormous growth of the number of households in the SMA led to a relatively low housing supply ratio. Between 1980 and 1990, the supply could only fulfil 70% of all housing demand. This placed the housing issue high on the political agenda. It became an important symbol of economic prosperity and the national government therefore strived to achieve homeownership for all households (Jun, 2010b). The national government took the direct responsibility to create sufficient housing for the population and reduce the pressure on the housing market (Jin, 2010). It launched large scale plans to develop millions of housing units to achieve this goal. These plans were prestigious electoral projects for the administrations in charge (Lee, 2010c). Therefore strict production and time targets were set for executive ministries and semi-governmental enterprises, such as the Seoul Housing Company *SH* (Jin, 2010). The housing supply ratio in the Netherlands has been at a constant high level of 97% since 1980 supplying most households with housing. Instead of a quantitative demand as in Korea, the Dutch demand was mainly qualitative, making housing a less urgent political issue.

Hypothesis 2: High quantitative housing demand makes housing development a more important political issue.

To achieve the large scale housing development plans, the Korean central planning authority used the hierarchical national planning framework to set strict production and price targets for regional and local governments (Jang, 2010; Saul, 2010). Especially the SMA is subjected to strict national goals: about 70% of all national planning policies are focussed on the area (Jin, 2010; Jun, 2010b). On a lower level, the regional and local governments are only responsible for execution of the national targets (Jin, 2010). To meet these goals regional and local governments use two instruments of formal institutional intervention: regulations on land use and conversion, and housing price

regulation. Through the first instrument, the government can designate land for housing development and can also relatively easily obtain the ownership of land for new developments. The 1972 land supply act ensures that land can be nationalised within six to twelve months (Jun, 2010b). Until the turn of the century, this forced conversion of land was executed at prices determined by the government (Jang, 2010). Nowadays, the market price is used for forced conversion, due to successful legal actions of citizens. This planning instrument ensures the quick development of land since ownership problems are relatively easy to overcome. For a long time, it also ensured a relatively cheap supply of land (Jin, 2010). The second instrument used by the Korean government is price regulations for new housing to ensure housing affordability. Until 2000, newly produced dwellings were subjected to price caps. The reason for this measure is twofold, it was established to ensure affordable housing, but later it also became an instrument to prevent speculation on housing (Jang, 2010; Jun, 2010a; Lee, 2010a). Because of the price regulations, the development of privately owned land for new dwellings was financially unattractive. Redevelopment of existing dwellings was still possible since the price cap did not apply to such projects. Most of the housing developments therefore came from plans initiated by the government, driven by the relatively cheap supply of land (Jin, 2010). This explains the stable housing price level under high demand until 2000 and the housing supply inelasticity identified from the neoclassical perspective until 1986. When the price caps were removed in 2000, private housing development of new dwellings became financially possible. These developments only existed with respect to plots with a high market value, usually brownfield locations in urban areas with the time consuming issue of citizen participation. Still, the governmental involvement in housing development projects in Korea and the SMA is about 40% of all housing production in 2010 (Jun, 2010b). For the city of Seoul this percentage is lower with only 10% public development (Jang, 2010; Lee, 2010a). This has led to higher housing prices but due to increasing incomes real housing prices remained stable.

Comparing this situation to the Netherlands it is noteworthy that the Dutch government also controls land conversion, but the time span to expropriate land is much longer, often taking many years. Also, the financial compensation has always been on the market level, causing higher expenses for the government. In the Netherlands, housing price control is enforced on social rental housing, which constitutes 35% of the total housing stock. These price regulations arise from the same political motives as in Korea: to assure affordable housing. However, the instrument in the Netherlands is different. Subject subsidies are used instead of object regulations. Because of that, the housing price is not directly negatively affected. Supporting the demand side can even have a positive influence on the housing price. For the other 65% of the housing stock, there are no price regulations. Looking at the government as housing development initiator, the Dutch government also took a leading role in

housing development for a long period of time. Until 1990 about 70% of the developed housing stock was subsidised. Due to the focus shift towards private homeownership, this percentage was reduced to 40% in 2000 (CBS, 1999 cited in Boelhouwer, 2005, p.364). This is comparable to the current Korean situation. The difference between the planning system in Korea and the Netherlands is that in Korea more strict top down oriented goals oblige lower level Korean governments to achieve national housing development plans for sufficient and affordable housing. The executive governments use the land supply law to obtain land for development, and use price caps to ensure affordability. This leads to hypothesis 3.

Hypothesis 3: Top down governmental planning with limited rights for lower governmental planning levels enables rapid housing development.

4.4 Execution of housing development plans

Given the framework of governmental importance and organisation of housing development, the implementation of the Korean housing development policy directly influences the housing development speed. Three typical characteristics arise from expert interviews and local fieldwork: large greenfield developments, building quality and the role of the *chaebol* conglomerates. The housing development in the SMA existed for about 40% of large-scale greenfield developments around the city of Seoul (Shin, 2005). To fulfil the strict national goals of housing production at low price and high speed, the development of greenfields was the most logical solution. The 1972 land readjustment law gave the Korean government a strong position in land development (Jang, 2010). Today, despite the involvement of private developers in housing production, the governmental involvement in land development projects, or land conversion, is still about 80% (Lee, 2010a). In this way, large plots of land can relatively quickly and cheaply become available for housing development. This enables fast and large scale housing production (Ahn, 2010). Because the greenfield plots are largely undeveloped, there are few planning constraints and an opportunity for relatively cheap bulk production of housing arises (discussed further below). From 1960 onwards, the greenfields directly around the city of Seoul have been filled in. However, this development is constrained by the policy that the green belt around Seoul has to be preserved. From 1989 the housing production goals were achieved by the creation of large new towns outside of this green belt (Jun, 2010a). With the first wave of five new towns, about 300.000 dwellings were realised within eight years from announcement to completion (Lee et al., 2002). The second wave of new tows is planned to create 600.000 new dwellings between 2001 and 2012 (Park, 2010).

Figure 4.1: Development of Bundang new town, before and after (Park, 2010)

Whereas most past housing development consisted of greenfield development, today the shift toward brownfield, or redevelopment, is made (Jang, 2010). This is because all central greenfield areas are filled in and the existing central housing stock has reached its replacement age. The Seoul metropolitan corporation, the governmental housing corporation for Seoul, used to develop mainly greenfield locations (Jin, 2010). In contrast, brownfield locations are mainly developed by private developers. For example, the share of the public sector in developments within the city of Seoul was only 10% until the 2000s (Ahn, 2010; Jang, 2010; Lee, 2010a). Jin (2010) expects that the governmental focus will have shifted completely towards brownfield development by 2015. Lee (2010a) supports this view by stating that housing development in the SMA will consist of brownfield developments for at least 80%. With the shift towards brownfield development, the speed of new total housing production is expected to decline. Private brownfield developments legally require citizen participation of at least 75% of the homeowners and land expropriation is very difficult (Jun, 2010b; Lee, 2010b). Most brownfield developments therefore arise from owner's initiative rather than the initiative of housing developers (Lee, 2010a). Ahn (2010) estimates the participation process to add two to three years to a redevelopment project. Housing development in the Netherlands has seen a similar pattern as Korea. A significant part of the housing production was achieved by small-scale urban densification and from 1960 onwards the Dutch government appointed so called 'growth centres' for housing development. These growth areas were mostly greenfields areas around existing towns. Only a few new towns were created close to the already highly populated city of Amsterdam. However, at the end of the 1980's the governmental policy evolved towards a compact city policy to prevent parts of existing cities from being abolished. Since then, housing development has focussed more on inner city brownfield developments (Spit and Zoete, 2002). Comparing the SMA to the Randstad, both countries have pursued a greenfield development policy, making large scale housing

development possible. Eventually, both countries have also focussed on brownfield development. The difference for the SMA is that the greenfield developments took place on a larger scale and for a longer period. This leads to the following hypothesis about the rapid housing development in the SMA:

Hypothesis 4: Large-scale development of greenfield locations enables voluminous housing production.

In Korea the strict and important governmental goals for national housing development have bounded the housing quality between 1960 and 1990. The Korean government predetermined housing development time, quantity, cost level and land supply. The rapid production of large quantities of dwellings under limited land supply was most important and this constrained housing quality (Lee, 2010a). Jang (2010) states that the main concerns for the government in this period were speed and quantity. Hussain (2010) calls this a utilitarian perspective on housing development to support the national economy, an 'economy first' approach. This resulted in two, not necessarily negative, characteristics of most dwelling built in this period: mainly high-rise apartment buildings with a relatively short lifetime and lower quality. Large apartment buildings were unknown in Korea until 1960 (Gelézeau, 2008). Strikingly, today they form over 50% of the housing stock in the SMA. Given the large need for affordable housing and the restrictive land policies in the SMA, houses have become higher (Ahn, 2010). The average building height increased to 30-35 stories (Jun, 2010b). In this way large quantities of housing units were added to the stock. Another advantage of high-rise buildings is the fact that the average costs per dwelling are reduced: the fixed costs remain the same and the building costs only gradually increase with the height (DiPasquale and Wheaton, 1996). After 2000 when the price caps on housing were removed because of the limited land supply, a high land price kept supporting the financial incentive of high-rise apartment developments. In the Netherlands, high apartments buildings are much less common. Due to height restrictions, most housing is limited to 3-5 stories. Many housing development projects in the Netherlands created low apartment buildings or the common row houses that form 40% of the Dutch housing stock (CBS, 2010).

Hypothesis 5: The absence of height restrictions enables voluminous housing development.

Looking at the average lifetime and building quality of the Korean apartments, an increase in both is noticeable. From 1960 until 1990 the housing development mainly focussed on quantity and speed (Lee, 2010a). To maximise their profit under the price cap system, private developers only met the

minimum quality standards and maximised the floor space because that was the only factor that determined the sales price. This led to the distinctive size pattern of built apartments as can be seen in figure 4.2. Until 1998, governmental regulations prescribed 70% of new dwellings to be less than 85 square meters and 30% to be less than 60 square meters. As a result, housing developers maximised the floor space for both categories.

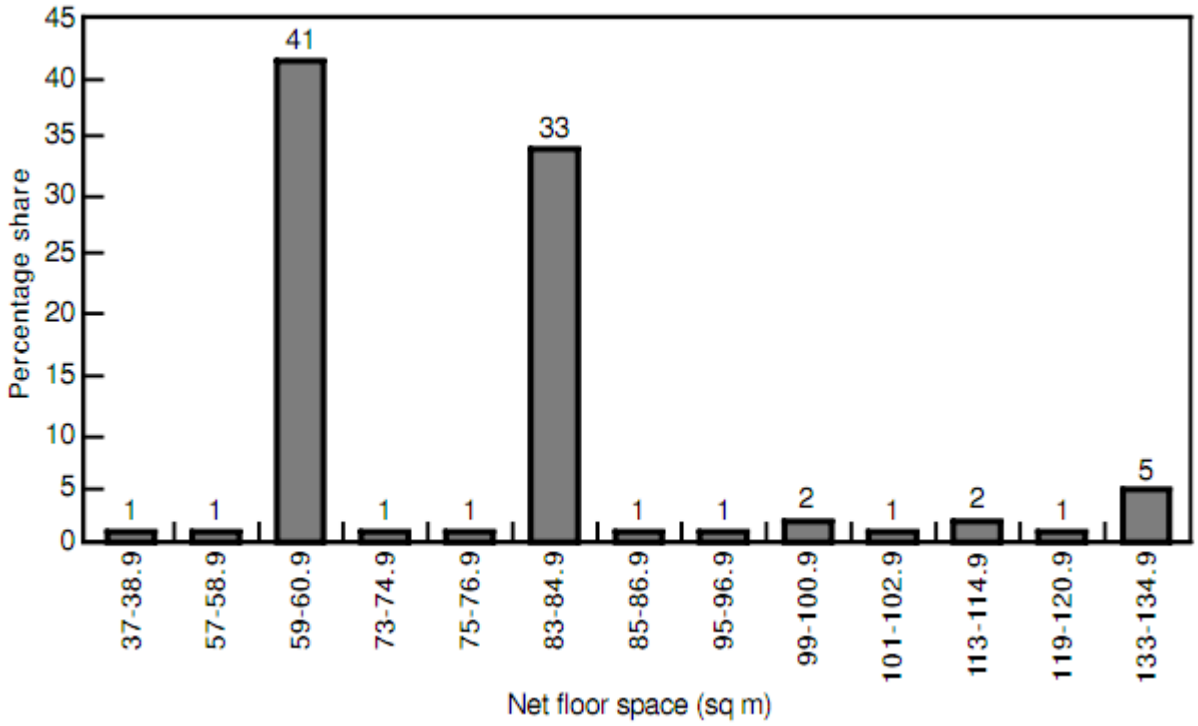


Figure 4.2: Size distribution of new housing units built from 1993 to 1996, tails are cut off (Kim and Kim, 2000)

The relative low quality of the housing production between 1960 and 1990 results in a short lifetime of about 20 to 30 years (Gelézeau, 2008; Jang, 2010). Therefore, many of the first post war housing development is currently on or over the edge of redevelopment (Lee, 2010c). Some of this stock is already redeveloped, but most projects are still in use, as can be seen in figure 4.3.

Figure 4.3: 1960-1990 low quality apartment buildings in Seoul (Seocho-gu and Seongbuk-gu) (own collection)

With the creation of the new towns in the 1990s, the focus turned towards housing quality. According to Jang (2010) from 1960 a rapid shift towards medium quality housing was made, from 1990 a slow shift towards high quality housing is noticeable. Jin (2010) of the Seoul metropolitan corporation, states that quantity is no longer the main driver and urban design has become more important (Jin, 2010). The governmental building codes and environmental regulations became stricter as to improve the quality of new projects (Ahn, 2010; Lee, 2010b). For example, the obligated percentage of green space land use for new development projects of over 300 units was increased from 10% to 30% (Jang, 2010; Lee, 2010c). Since the abolishment of the price caps in 2000, private developers are also stimulated to increase the quality of new projects. As a result, the production time of new housing has become longer. However, with higher building quality, the economic value and lifetime of these projects increases (Jang, 2010). From 1990 the lifetime of housing increased to 70 years (Jun, 2010b; Lee, 2010a; Lee, 2010b), and quality of these projects can be described as modern, see figure 4.4.

Figure 4.4: Post 1990 high quality apartment buildings in Bundang and Incheon (own collection)

For the Netherlands a similar path in housing quality development can be distinguished. Post war housing production was of relatively low quality. With new governmental policies, more attention was given to the spatial quality of housing development starting with urban renewal projects in the 1960s (Ekkers, 2006). There is no significant difference with Korea, but the relatively low Korean quality standards before 1990 do offer an explanation for the rapid housing development until then.

Hypothesis 6: Lower quality housing in favour of housing development cost, quantity and speed stimulates rapid housing development.

The *chaebol* conglomerates play an important role in the rapid housing development in Korea. These large multidisciplinary family companies, like Daewoo, Hyundai, Samsung and Ssangyong, nowadays known for their production of automobiles and electronic products, have been actively involved in housing development projects of the Korean government (Yoon, 1994). Selected because of their financial, production and knowledge capacities, around 100 designated builders are involved in the development of governmental housing projects, mainly the development of greenfields. These builders can benefit from special tax and financial conditions (Shin, 2005). The *chaebols* act as both developers and builders, and take care of the whole development process from design to build and sale (Ahn, 2010; Jun, 2010a; Lee, 2010b; Saul, 2010). Because of their size, benefits of scale can be achieved, like capital efficiency and expertise. This makes the production of housing cheaper and enables the companies to build at a higher speed. The fact that the *chaebols* were chosen to engage in housing development has decreased the investment risk for the companies, since a steady flow of building orders is assured. By doing so, the Korean government tried to assure certainty in realising its housing production targets for a rapid and voluminous development of affordable housing. Today the *chaebols* still dominate the larger development of housing (Lee, 2010c; Saul, 2010), although the intensive cooperation with the government now exists in competition with other companies and leads to public-private-partnerships (Jin, 2010). In the Netherlands, the designation of housing developers as such is unknown. In contrast, housing development projects are usually set out in free competition.

Hypothesis 7: The designation of chaebol conglomerates for housing development enables rapid large-scale housing development.

4.5 Discipline and hard work

The Korean culture is very disciplined. Two factors that influence housing development speed arise from this characteristic: authority and leadership are respected and hard work is embedded in the

Korean culture. Kihl (1994) describes the influences of ancient Confucian values on modern economics and politics in Korea. Confucianism is a humanistic belief in which humans can develop through personal efforts. Kihl states that these values stress the hierarchy within society and hereby influence the way economics and politics are organised. This can work as a support for more top down oriented governance and plan making within the housing market and a more compliant civil society. This positively affects housing developments speed because political decision-making becomes more efficient. The hierarchy is strengthened by the fact that Korea has a relatively short history of modern democracy. Only from 1987 Korea experiences full democracy after the military leaders had to gave up their political power. Because of the absence of a long democratic history, Korea is not very familiar with bottom up democracy and the public has great respect for the plans of their leaders (Jun, 2010b). This is also expressed by an above average focus on the collective instead of the individual and the larger purpose of governmental plans (Saul, 2010). In terms of behavioural theory, regard, i.e. what others think, is very important to the Korean population. The other characteristic of the Korean culture that is important to housing development speed is the embedment of hard work in the Korean culture. Only in 2004, the Korean government started to reduce the legal workweek to five days and 40 hours. The rollout of this law took until 2011, so until recently a six day working weeks and long hours were common for many Koreans (Korean Labour Law, 2012). The Korean phrase '*pali pali*', meaning 'quick quick', is typical for Korean work ethics (Saul, 2010). This leads to a higher productivity and speed in the housing development sector. In contrast to the young Korean democracy, the Netherlands has a long democratic history. Dutch cultural values can generally be typified as liberal with an emphasis on the individual. A lesser top down oriented governance and planning system reflects this culture. In addition, citizens are more likely to have a not-in-my-back-yard mentality. This can negatively influence the housing development speed of the country, because all people influenced by a housing project wish to have a say in the process. Concerning work, the Dutch welfare state provided the people with relatively short working weeks of 36-38 hours (Eurofound, 2012). This leads to the next hypothesis about the rapid housing development in the SMA:

Hypothesis 8: Respect for hierarchy and hard work enables rapid housing development.

4.6 Acceptance of apartments

Another behavioural aspect that affects housing development is the general acceptance of high-rise apartment buildings. Before 1960 Korea was not familiar with high-rise apartment building at all, but. nowadays they represent more than 50% of the total housing stock. Three behavioural explanations for this acceptance can be identified: satisfaction, framing and regard. A first logical explanation lies

in the relative position of the Korean economy when apartments were first build in the 1960s. At that time housing conditions were relatively poor. Many households were living together in multiple family housing with shared facilities (Yoon, 1994). Almost every change from this situation was perceived as an improvement, even if the improvement was a relatively cheaply built apartment with a relatively short lifetime. The relative improvement satisfied the individual tenants. A second explanation can be found in the positive framing of apartments by the Korean government. This 'new and modern' type of housing was promoted by financially stimulating high status citizens, like doctors and government officials, to move into these newly developed dwellings. The popularity of apartments was not only a sign of high pressure on the housing market, modernism or a relative improvement, but also a powerful social construct created by the government (Gelézaeu, 2007). The governmental framing created a more positive attitude towards the concept. A third explanation is the relative monoculture in Korea. The absence of large groups of immigrants with other cultural values enforces the Korean culture and Confucian values like discipline, respect for authority and hard work. These strong behavioural values are expressed in a high social control and a low crime rate. This makes housing conditions in Korea more stable. Devaluation of neighbourhoods by litter and crime, as seen in Western Europe where relatively cheap apartments attract low-income classes, is not likely to happen in Korea. This makes the concept of apartments more durable. Comparing this situation to the Netherlands, it appears that apartment buildings have been less popular according to the Dutch. The relative improvement was less than in Korea, since most households did have low quality but unshared housing. Also, the alternative offered by governmental initiated projects firstly existed of low-rise buildings or row houses. When high-rise apartment projects were developed in the Netherlands they were also perceived as a symbol of modernism at first. But when better alternatives came onto the market, these projects remained only attractive to lower income groups. Combined with the culture of individualism and diversified cultural backgrounds because of immigration, these areas have devaluated (Ekkers, 2006). This created a negative perception of high-rise apartment housing. Today, small-scale apartment developments do flourish but large scale apartment developments rarely take place. Conclusively, this leads to the last hypothesis on rapid housing development:

Hypothesis 9: The behavioural context leads to high acceptance high-rise apartment housing development enabling voluminous housing development.

4.7 Conclusion

This chapter gives different but interrelated hypotheses on the rapid Korean housing development. Although the neoclassical approach for a macro level does not give a direct explanation, its forces are

an important exogenous variable on other levels of analysis. Many, sometimes obvious, institutional hypotheses are formed because the governmental influence on housing development is extensive. The behavioural approach on a micro level, lead to detailed insight in society's behaviour in the housing market. The value of these hypotheses in this chapter to speed up housing development in the Netherlands will be determined in the next chapter.

5. Conclusion

This chapter concludes this thesis by answering the main research question. First, several general findings are presented. This is followed by an analysis of each hypothesis from chapter 4 with respect to the feasibility that further research will lead to concrete housing development speed improvements in the Netherlands. In this way the main research question stated below can be answered in detail: '*What can be learnt from the housing development in the Seoul Metropolitan Area to accelerate the housing development in the Dutch Randstad area?'*

5.1 General findings

Driven by its economic development, Korea made enormous economic progress the last 50 years. This development, combined with demographic factors, led to a 600% increase in households in the SMA and a relatively low housing supply ratio. This has brought the Korean government to take large-scale action to fulfil the housing demand. A quantitative approach was chosen to quickly create millions of affordable housing units, affordable meaning both affordable for the government that did not have sufficient capital to subsidise housing as affordable for the tenants that largely had to finance their own housing. Around the turn of the century the quantitative goal was achieved. The focus then changed towards the quality of housing and replacement of outdated stock. These policies have become more affordable because of an increasing GDP. In addition, property rights are increasing, and combined with a higher quality of housing and the shift towards brownfield development, a decrease in housing development speed is expected. Based on the constant high housing supply ratio in the Netherlands, the shift from quantity to quality, or redevelopment, was made earlier. Because of that, the scale of governmental interventions was smaller and the housing development speed lower. Coming from different paths, Korea and the Netherlands might end up in the same housing market situation, only with a very different cityscape. Nevertheless, the study of the Korean path can provide usable insights for the Netherlands. This is discussed in the next paragraph.

5.2 What can be learnt?

Hypothesis 1: Governmental interventions prevent fast market clearance.

In Korea and the Netherlands neoclassical mechanisms do not directly satisfy the housing demand. Institutional barriers stand in its way. This does not disqualify the neoclassical approach. Its general principles stand firmly and although the large housing demand in the SMA is not directly fulfilled from a this perspective, its demand influences decisions made according to other theoretical approaches. Since government in the Netherlands intervenes extensively in the housing market, reducing its role can be considered to speed up housing development.

Hypothesis 2: High quantitative housing demand makes housing development a more important political issue.

The high housing demand arises from macro level forces and cannot be stimulated easily. This hypothesis does however stress that political will to act on housing market demand can result in significant actions. In a functional democracy, the political will should be a reflection of the wishes of the people. In fact, it can be stated that a lack of political will to increase housing development speed is because the majority of the population does not want it to. Further research on the concept of agenda-setting power is needed to determine whether the government alone can set an agenda to speed up housing development.

Hypothesis 3: Top down governmental planning with limited rights for lower governmental planning levels enables rapid housing development.

The top down Korean planning system arises from a short democratic history and a compliant culture. The Dutch political system is much more bottom up oriented with plan making authority on the lowest levels. This authority is difficult to pull back by a national government. Also, given rights like citizen participation and the right to appeal are not easily withdrawn. Therefore this hypothesis does not bring forward any concrete learning points for the Netherlands.

Hypothesis 4: Large-scale development of greenfield locations enables voluminous housing production.

The greenfields strategy combined with the land supply act was the way to cheap and fast housing production in Korea. With increasing property rights, the costs of this policy increased. However, the government still has its regular planning power to convert land. In Korea these types of developments were executed on a much larger scale than in the Netherlands. To see if this is a possibility to speed up housing development in the Randstad, further research is needed. This should also include the possible negative effects like urban sprawl, bed town communities, infrastructure cost and intensive traffic.

Hypothesis 5: The absence of height restrictions enables voluminous housing development.

High buildings create large volumes of housing units and are embedded in Korean cities. Due to height regulations to preserve the cityscape, these type of buildings are much less common in the Netherlands. Given the recent high quality high-rise housing projects in the SMA, these regulations could be reconsidered in the Randstad, at least locally. It is an opportunity to increase both housing volume as housing quality.

Hypothesis 6: Lower quality housing in favour of housing development cost, quantity and speed stimulates rapid housing development.

The importance of housing quantity was a boost for the Korean housing stock until 2000. Since then, the focus was shifted towards the qualitative demand. Lowering quality standards does not seem a feasible option for the Netherlands to speed up housing development. This would contradict with the common idea of ever improving quality of life in the economically advanced parts of the world.

Hypothesis 7: The designation of chaebol conglomerates for housing development enables rapid large-scale housing development.

The *chaebol* conglomerates made a significant contribution to the development of the Korean housing stock. Their power is related to the economic development of Korea. A comparable situation is not present in the Netherlands. In the Netherlands housing development projects are usually divided among several developers. It can be fruitful to study the possibility of contracting fewer or single parties for large development projects. In this way advantages of scale can be achieved to speed up housing development.

Hypothesis 8: Respect for hierarchy and hard work enables rapid housing development.

This Korean cultural value helps to explain the rapid Korean housing development. However, these values are very difficult to transfer onto the Dutch culture and therefore do not offer a possibility to speed up housing development in the Randstad.

Hypothesis 9: The behavioural context leads to high acceptance high-rise apartment housing development enabling voluminous housing development.

The relative housing quality improvement and the promotion projects made apartments popular in Korea. When developing apartment buildings in the Randstad, these tools could be used to stimulate this type of high volume housing development. When offering a higher quality living environment, the negative Dutch attitude towards high-rise apartments could be turned around. This would facilitate a large-scale development of high-rise apartments to speed up housing development.

In short, it is possible to draw a number of lessons from the housing development in the SMA. First of all, the role of the government is an important factor, together with the possible means to influence the housing market and the cultural values present in the society. Secondly, the possibility to develop green fields creates potential for voluminous housing production. Thirdly, the restrictions on height and the popular opinion on high-rise building have an impact on the possibility to speed up the

housing development. Finally, the position of executors of housing production projects can influence the development speed of housing. Even though the SMA and the Randstad are more than 8,500 kilometres apart, it useful to study the characteristics of the housing development process in other countries.

5.3 Implications, further research and reflection

Even though some hypotheses are interesting to develop further, they do not have a direct Implication for housing development in practice in the Randstad area. The explorative character of this thesis has offered insight to possible new ways to speed up housing development. Operationalisation of these new ways is not easy. It involves changing existing formal and informal institutions that are embedded within the society. Therefore, further research on these topics is needed to come to concrete recommendations to actually improve housing development speed. From a theoretical point of view, this thesis can form a starting point to create an integral research model that uses the different theories of the neoclassical approach, the institutional approach and the behavioural approach from chapter 3 for geographical comparisons. This offers a multi angle approach for comparisons. In current research, usually just one of the theories is used while the explanations can be found in multiple theoretical approaches. Further theoretical research is needed to determine whether a model that uses three different but interrelated theoretical approaches is feasible or that insights of other theories can be incorporated into one existing theory. For example, the integrated framework could be applied to other countries to test its usability. With respect to the lessons that can be learned from the Korean situation, further study can be fruitful in the field of limiting the role of the government, housing development as a political issue, large-scale development of greenfield locations, the impact of height restrictions, the possibility of contracting specific parties to execute housing projects, and possibilities to improve the image of high-rise housing.

Looking back on this research project, some reflections are to be made. It was difficult to define the exact scope of this explorative research project. On the one hand one wants to give a broad overview of all matters related to the research subject. On the other hand it is impossible to go in depth on every subjects and one has to demarcate the research possibilities. Unfortunately, this has not led to a perfect balance of all related topics. Some are extensively described, for example demographic aspects, and others are underexposed because of the lack of data, for example the role of construction costs. Furthermore, some difficulties were experienced in finding comparable datasets on more specific subjects like elasticity and in the operationalisation of the different theories to

make them measurable. Despite the above, the project has succeeded in making a proper comparison between the two research areas of the Seoul Metropolitan Area and the Randstad. In addition, a decent theoretical overview was designed to explore the different approaches on housing development speed. Finally, the exploration of the SMA housing market using expert interviews went well due to active and enthusiastic participation of the interviewees.

6. Bibliography

AHN, B. (2010) Interview. *ING Real Estate Investment Management* [21-6-2012].

AMIN, A. (2001) Moving on: institutionalism in economic geography. *Environment and planning*, 33, pp. 1237-1241.

BALL, M. (1998) Institutions in British property research: a review. *Urban studies*, 35-9, pp. 1501-1517.

BARKER, K. (2004) *Review of housing supply*. London: HMSO.

BENGSTON, D.N. and YOUN Y.C. (2005) *Seoul's greenbelt: an experiment in urban containment* [WWW] USDA, United States Department of Agriculture. Available from: http://nrs.fs.fed.us/pubs/gtr/gtr_nc265/gtr_nc265_027.pdf [Accessed 3-1-2011].

BOGNER, A., LITTIG, B. and MENZ, W. (eds.) (2009) *Interviewing experts*. Houndmills: Palgrave Macmillan.

CAMERER, C. (2000) *Prospect theory in the wild*. In: MONTIER, J. (2002) *Behavioural finance, insights into irrational minds and markets*. Chichester: John Wiley & Sons, pp. 27.

CBS, Centraal Bureau voor de Statistiek (2007) *Bevolkingstrends: huishoudensprognose 2006-2050* (edited) [WWW]. Available from: http://www.cbs.nl/NR/rdonlyres/C2B111AE-3DFA-4B53-A4BB-BACD9E66B74D/0/2007k2b15p53art.pdf [Accessed 16-1-2011].

CBS, Centraal Bureau voor de Statistiek (2010) *Statline* [WWW]. Available from: http://statline.cbs.nl [Accessed see paragraph 7.4.1].

CIA, Central Intelligence Agency (2012) *The world factbook* [WWW]. Available from: https://www.cia.gov/library/publications/the-world-factbook/geos/ks.html and https://www.cia.gov/library/publications/the-world-factbook/geos/nl.html [Accessed 4-3-2012].

CHESHIRE, P. and VERMEULEN, W. (2008) Land markets and their regulation: the welfare economics of planning. In: GEYER, H.S. (ed.) *International handbook of urban policies, vol. II*. Cheltenham: Edward Elgar, pp. 151-193. Available from: http://eprints.lse.ac.uk/30787/1/Land_markets_and_their_regulation_(LSERO_version).pdf [Accessed 21-3-2011]

DE PATER, B. and VAN DER WUSTEN, H. (1996) *Het geografisch huis*. Bussum: Coutinho.

DIPASQUALE, D. and WHEATON, W.C. (1992) The markets for real estate assets and space: a conceptual framework. *Journal of the American real estate and urban economics association*, 20-1, pp. 181-197.

DIPASQUALE, D. and WHEATON, W.C. (1994) Housing market dynamics and the future of housing prices. *Journal of urban economics*, 35, pp. 1-27.

DIPASQUALE, D. and WHEATON, W.C. (1996) *Urban economics and real estate markets*. Upper Saddle River: Prentice Hall.

DYMSKI, G.A. and ISENBERG, D. (2002) *Seeking shelter on the pacific rim, financial globalisation social change, and the housing market*. Armonk: M.E. Sharpe.

EGGERTSSON, T. (1990) *Economic behaviour and institutions*. In: KEOGH, G. and D'ARCY, E. (1999) Property market efficiency: an institutional economic perspective. *Urban studies*, 36-13, pp. 2401-2414.

EKKERS, P. (2006) *Van volkshuisvesting naar woonbeleid.* 2nd ed. The Hague: Sdu Uitgevers.

ELSTER, J. (1998) Emotions in economic theory. *Journal of economic literature*, 36-1, pp. 47-74. In: SCHMID, A.A. (2004) *Conflict and cooperation, institutional and behavioural economics*. Oxford: Blackwell Publishing, pp. 35.

ESPING-ANDERSON,G. (2002) *Why we need a new welfare state*. Oxford: Oxford University Press.

EUROFOUND (2012) *Working time developments – 2008* [WWW]. Available from: http://www.eurofound.europa.eu/eiro/studies/tn0903039s/tn0903039s.htm [Accessed 2-5-2012].

GAVIRINA, A. (2001) Endogenous institutions: the importance of history. *Lecturas de economía*, 35, pp. 133-148. Available from: http://aprendeenlinea.udea.edu.co/revistas/index.php/lecturasdeeconomia/article/viewFile/4897/4290 [Accessed 1-5-2012].

GELÉZAEU, V. (2007) *How did Korea become a land of apartments?* [podcast] From arts program, Korea Society, New York 5-4-2007. Available from: http://www.koreasociety.org/arts/gallery/how_did_korea_become_a_land_of_apartments_.html [Accessed 12-3-2012].

GELÉZAEU, V. (2008) *Korean mass housing* production. In: FRANK, R. et al. (eds.) *Korea yearbook 2007*. Leiden: Brill.

GEOCOMMONS (2008) *First level administrative boundaries* (edited) [WWW]. Available from: http://geocommons.com/overlays/1347 and http://geocommons.com/overlays/756 [Accessed 24-1-2011].

GLAESER, E.L., GYOURKO, J. and SAKS, E. (2005) Urban growth and housing supply. *NBER working paper series*, 11097.

GLAESER, E.L., GYOURKO, J. and SAIZ, A. (2006) Housing supply and bubbles. *NBER working paper series*, 13704.

HA, S. (1999) Urban growth and housing development in Korea. *Korea journal*, 39-3, pp. 63-94 [WWW]. Available from: http://www.ekoreajournal.net/archive/detail.jsp?BACKFLAG=Y&VOLUMENO=39&BOOKNUM=3&PAPERNUM=3&SEASON=Autumn&YEAR=1999 [Accessed 10-8-2010].

HANNAH, L., KIM, K.H. and MILLS, E.S. (1993) Land use control and housing prices in Korea. *Urban studies*, 30-1, pp. 147-156.

HODGSON, G.M. (1997) The ubiquity of habits and rules. *Cambridge Journal of Economics*, 21, pp. 663-684.

HUSSAIN, T. (2010) Interview. *Maxmakers* [22-6-2010].

HWANG, M., QUIGLEY, J.M. and SON, J. (2006) The dividend pricing model: new evidence from the Korean housing market. *Journal of real estate finance and economics*, 32, pp. 205-228.

HWANG, M. and QUIGLEY, J.M. (2006) Economic fundamentals in housing markets. *Journal of regional science*, 46-3, pp. 425-453.

JANG, Y.H. (2010) Interview. *Seoul Development Institute*. [1-7-2010].

JIN, S.H. (2010) Interview. SH, Seoul metropolitan SH corporation [30-6-2010].

JUN, H.L. (2010a) Interview. *EUCC, European Union Chamber of Commerce* [28-6-2010].

JUN, S.B. (2010b) Interview. *MLTM, Ministry of Land, Transportation and Maritime affairs* [11-7-2010].

KAHNEMAN, D., KNETSCH, J.L. and THALER, R.H. (1986) *Fairness as a constraint on profit seeking*. In: SCHMID, A.A. (2004) *Conflict and cooperation, institutional and behavioural economics*. Oxford: Blackwell Publishing, pp. 47.

KEOGH, G. and D'ARCY, E. (1999) Property market efficiency: an institutional economic perspective. *Urban studies*, 36-13, pp. 2401-2414.

KIM, C.H. and KIMK.H. (2000) The political economy of Korean government policies on real estate. *Urban studies*, 37-7, pp. 1157-1169.

KIHL, Y.W. (1994) The legacy of Confucian culture and South Korean politics and economics. *Korea journal*, autumn 1994, pp. 37-53.

KIM, N.H. (2004) *An introduction of the 2000-2005 population and housing census in Korea* [WWW]. Available from: http://www.unescap.org/stat/meet/census2004/census2004_rep_korea.pdf [Accessed 31-1-2011].

KIVELL, P. (1993) *Land and the city, patterns of urban change.* London: Routledge.

KNOX, P.L. and MARSTON, S.A. (2003) *Human geography, places and regions in global context*. 2nd ed. Upper Saddle River: Prentice Hall/Pearson Education.

KOREAN LABOUR LAW (2012) *On 40 hours workweek of Korea* [WWW]. Available from: http://www.koreanlaborlaw.com/on-40-hour-workweek-of-korea/ [Accessed 2-5-2012].

LEE, B.S., CHUNG, E. and KIM, Y.H. (2005) Dwelling age redevelopment and housing price: the case of apartment complexes in Seoul. *Journal of real estate finance and economics*, 30-1, pp. 55-80.

LEE, C., LEE, J. and Yim, C. (2003) A revenue sharing model of residential redevelopment projects: the case of the Hapdong redevelopment scheme in Seoul, Korea. *Urban studies*, 40-11, pp. 2223-2237.

LEE, C. and CHOI, S. (2007) Housing market: structural relationships among sales, chonsei, and monthly rent markets [WWW]. *Proceedings of the 2007 Asian real estate society annual conference (ASRES)*. Available from: http://www.asres2007.umac.mo/papers/069%20-%20PAPER.pdf [Accessed 2-7-2010].

LEE, K.J., KIM, H.K. and Ahn, K.H. (2002) *The promotion of private sector for new town development in Korea* [WWW]. AsRES/AREUEA joint international conference 2002. Available from: www.kreaa.org/AsRES/doc/LeeJinKyung(H3).doc [Accessed 24-3-2012].

LEE, C.M. (2010a) Interview. *Hanyang University* [5-7-2010].

LEE, H.T. (2010b) Interview. *Hyundai Development Company* [12-7-2010].

LEE, W.J. (2010c) Interview. *LH, Land and Housing corporation* [24-6-2010].

MALPEZZI, S. and MAYO, S. (1997) Getting housing incentives right. *Land economics*, 73, pp. 372-391.

MARTIN, R. (2005) Institutional approaches in economic geography. In: SHEPPARD, E. and BARNES, T.J. (eds.) *A companion to economic geography*. Oxford: Blackwell Publishing.

MAYO, S. and SHEPPARD, S. (1996) Housing supply under rapid economic growth and varying regulatory stringency: an international comparison. *Journal of housing economics*, 5-14, pp. 274-289.

MEEN, G. (2005) On the Barker review of housing supply. *Housing studies*, 20-6, pp. 949-971.

MITCHELL, O.S. and UTKUS, S.P. (eds) (2004) *Pension design and structure: new lessons from behavioural finance*. In: STRAUSS, K. (2007) Re-engaging with rationality in economic geography. *Journal of economic geography*, 8-2, pp. 137-156, pp. 143-144.

MLIT, Ministry of Land, Infrastructure, Transport and Tourism, Japan (2012) *An overview of spatial policy in Asian and European countries*. [WWW]. Available from: http://www.mlit.go.jp/kokudokeikaku/international/spw/general/korea/index_e.html and http://www.mlit.go.jp/kokudokeikaku/international/spw/general/netherlands/index_e.html [Accessed 4-3-2012].

MLTM, Ministry of Land, Transport and Maritime affairs (2008) *Housing construction records 1990-2007* (edited) [WWW]. Available from: http://www.mltm.go.kr/DataCenter/StatisticData/08sta/04/04_intro.jsp [Accessed 13-6-2010].

OECD, Organisation for Economic Co-operation and Development (2007) *OECD economic survey 2007 Korea* [WWW]. Available from: http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-korea-2007_eco_surveys-kor-2007-en [Accessed 9-10-2010].

OECD, Organisation for Economic Co-operation and Development (2010) *A bird's eye view of the OECD housing markets* [WWW]. Available from: http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ECO/WKP(2010)2&docLanguage=En [Accessed 4-3-2012].

OUWEHAND, A. and DAALEN, G. van (2002) *Dutch housing associations* [e-book]. Delft: Delft University Press Satellite. Available from: http://repository.tudelft.nl/assets/uuid:8daad347-7155-42c8-87f9-02e5e2b721fe/OTB2002%20DHA%20web.pdf [Accessed 29-1-2011].

PHANG, S., KIM, K.H. and WACHTER, S. (2010) *Supply elasticity of housing* [WWW]. Available from: http://ink.library.smu.edu.sg/soe_research/1253 [Accessed 15-3-2011].

PARK, S.Y. (2007) The state and housing policy in Korea. In: GROVES, R., MURIE, A. and WATSON, C. (eds.) *Housing and the new welfare state, perspectives from East Asia and Europe* [e-book]. Abingdon: Ashgate Publishing Limited, pp. 75-100. Available from: http://site.ebrary.com.proxy-ub.rug.nl/lib/ugroningen/docDetail.action?docID=10209189 [Accessed 12-5-2010].

PARK, Y.J., KIM, H. and KO, H. (2002) *Household projections for the Republic of Korea* [WWW]. Daejon: National Statistics Office. Available from: http://www.ancsdaap.org/cencon2002/papers/Korea/Korea.PDF [Accessed 5-10-2010)

PARK, E.G. (2010) *New town development policy Korea* [WWW], from training program 2010-1. KRIHS KOICA, Seoul spring 2010. Available from: http://www.krihs.re.kr/html/5_globalBusiness/downfile/10_koica1/한국의 신도시 개발 정책.pptx [Accessed 24-3-2012].

PINTO, J.K. (2010) *Project management: achieving competitive advantage*. Upper Saddle River: Pearson Education.

PRAST, H.M. (2004) *Psychology in financial markets, an introduction to behavioural science*. Amsterdam: NIBE-SVV.

RIJKSOVERHEID (2012) *Wat is een sociale huurwoning en wanneer kom ik er voor in aanmerking?* [WWW]. Available from: http://www.rijksoverheid.nl/onderwerpen/huurwoning/vraag-en-antwoord/wat-is-een-sociale-huurwoning-en-wanneer-kom-ik-daarvoor-in-aanmerking.html [Accessed 30-4-2012].

SAUL, S. (2010) Interview. *Jones Lang LaSalle* [21-6-2010].

SCHMID, A.A. (2004) *Conflict and cooperation, institutional and behavioural economics*. Oxford: Blackwell Publishing.

SHIN, J.C. (2005) *New town development policy* [WWW]. From training program 2005-2. KRIHS KOICA, Seoul November – December 2004. Available from: http://www.krihs.re.kr/html/5_globalBusiness/downfile/05_koica2/05_Lecture14.pdf [Accessed 24-3-2012].

SKINNER, B.F. (1971) *Beyond freedom and dignity*. In: SCHMID, A.A. (2004) *Conflict and cooperation, institutional and behavioural economics*. Oxford: Blackwell Publishing, pp. 50.

SPIT, T. and ZOETE, P. (2002) *Gepland Nederland*. Den Haag: Sdu Uitgevers.

STATISTICS KOREA (2005) *Results of the 2005 housing census* (edited) [WWW]. Available from: http://kostat.go.kr/eboard_faq/BoardAction.do?method=view&board_id=106&seq=124&num=124&parent_num=0&page=1&sdate=&edate=&search_mode=s_title&keyword=housing&catgrp=eng2009&catid1=g01&catid2=g01b&catid3=g01ba&catid4= [Accessed 11-10-2010].

STATISTICS KOREA (2008) *나라지표, 수도권 집중현황-인구* [WWW]. Available from: http://www.index.go.kr/egams/stts/jsp/potal/stts/PO_STTS_IdxMain.jsp?idx_cd=1005&idx_kornm=수도권%20집중현황-인구 [Accessed 20-10-2010].

STATISTICS KOREA (2010) *Population and housing data* (edited) [WWW]. Available from: http://kosis.kr/eng/database/database_001000.jsp?listid=B&subtitle=Population and http://kosis.kr/eng/database/database_001000.jsp?listid=K&subtitle=Construction,%20Ports,%20Housing,%20Water%20supply%20service [Accessed 31-12-2010].

STRAUSS, K. (2008) Re-engaging with rationality in economic geography. *Journal of economic geography*, 8, pp. 137-156.

UN, United Nations (2010) *World urbanization prospect, urban population* (edited) [WWW]. Available from: http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS/countries/KR-NL?display=graph [Accessed 22-12-2010].

UNDP, United Nations Development Programme (2010) *The human development index* [WWW]. Available from: http://hdr.undp.org/ [Accessed see paragraph 7.4.2].

UNICEF, United Nations Children's Fund (2010) *The state of the world's children, GDP per capita average annual growth rate 1970-2008* (edited) [WWW]. Available from: http://data.un.org/Data.aspx?q=GDP+average&d=SOWC&f=inID:93#SOWC [Accessed 21-9-2010].

UNPD, United Nations Population Division (2008) *World urbanization prospects: the 2007 revision population database* (edited) [WWW]. Available from: http://esa.un.org/unup/ [Accessed 9-1-2011].

UNPD, United Nations Population Division (2009) *World population prospect: the 2008 revision* [WWW]. Available from: http://data.un.org/ [Accessed see paragraph 7.4.3].

UNPD, United Nations Population Division (2010) *World urbanization prospects, the 2009 revision* [WWW]. Available from: http://esa.un.org/unpd/wup/Documents/WUP2009_Highlights_Final.pdf (vistited 4-1-2011].

UNSD, United Nations Statistics Division (2009) *UNSD Demographic statistics, Population by sex and urban/rural residence* (edited) [WWW]. Available from: http://data.un.org/Data.aspx?q=urban+population&d=POP&f=tableCode:1#POP [Accessed 4-10-2010].

UNSD, United Nations Statistics Division (2010) *World statistics pocketbook* [WWW]. Available from: http://data.un.org/CountryProfile.aspx?crName=Netherlands#Summary and http://data.un.org/CountryProfile.aspx?crName=Korea,%20Republic%20of#Summary [Accessed 7-9-2010].

U.S. CENSUS BUREAU (2010) *International data base, midyear population by age and sex 2010* (edited) [WWW]. Available from: http://www.census.gov/ipc/www/idb/region.php [Accessed 10-12-2010].

VERMEULEN, W. and ROUWENDAAL, J. (2007) *Housing supply and land use regulation in the Netherlands*. The Hague: CPB, Centraal Planbureau.

VERMEULEN, W. (2008) *Essays on housing supply, land use regulation and regional labour market*. Amsterdam: Tinbergen Institute.

VROM, Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieu (2006) *Nota Ruimte* [WWW]. Available from: http://notaruimteonline.vrom.nl/0110020000.html# [Accessed 2-1-2011].

VROM, ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer (2006) *Ruimte geven, bescherming bieden, een visie op de woningmarkt* [WWW]. Available from: http://www.kei-centrum.nl/websites/kei/files/KEI2003/documentatie/vrom-visieopdewoningmarkt-jun2006.pdf [Accessed 11-10-2010].

WORLD BANK (2009) *World development indicators 2009* [WWW]. Available from: http://data.un.org/ [Accessed see paragraph 7.4.4].

YOON, I.S. (1994) *Housing in a newly industrialized economy*. Aldershot: Avebury.

7. Appendixes

7.1 List of definitions

Chaebol	Korean family conglomerate
Chonsei	Korean rent system in which the tenant pays a lump sum of 30 to 70% of the price of a dwelling for a two year rent-free use. This net payment is returned after the rental period.
Confusianism	A humanistic belief in which humans can develop through personal efforts
Housing development speed	Speed and volume of housing development
Housing supply ratio	Houses in the housing stock divided by the number of households
Randstad	Dutch urban agglomeration formed by the provinces of North Holland, South Holland and Utrecht
Seoul Metropolitan Area	Korean urban agglomeration formed by the administrative entities of Seoul, Incheon and Gyeonggi.
SMA	Seoul Metropolitan Area

7.2 Five year housing plans Korea

Plan	Goals
The First Plan (1962-1966)	- Construction of 475,340 units - Construction of public housing for low-income people - Focus on problems in Seoul
The Second Plan (1967-1971)	- Housing construction primarily relying on the role of private sector - Supply of housing sites - Introduction of multi-family housing in city areas where available sites are limited - Urban renewal of illegal blighted housing
The Third Plan (1972-1976)	- Increase of housing supply (Goal of 833,000 units) - Preservation of existing stock - Improvement of the standards of housing
The Fourth Plan (1977-1981)	- Introduction of mass housing production - Construction of smaller units by the public sector - Rational allocation of new housing among regions
The Fifth Plan (1982-1986)	- Increased production of Housing (Goal of 1,330,000 units) - Stabilization of housing prices - Promotion of the supply of rental housing - Improvement of housing environments
The Sixth Plan (1987-1991)	- Construction of 1.73 million units (The goal was changed to 2 million for the period from 1988 to 1992.) - Supply of small size units - Emphasis on rental housing construction - Supply of cheap land for housing - Stabilization of housing prices - Improvement of housing financing system
The Seventh Plan (1992-1996)	- Annual construction of 0.5 million housing units for the period of '92-'96. But the goal was increased to annual construction of 0.55-0.6 million units during the period of '93-'97. - Expansion of residential land development and housing finance - Continuation of the housing welfare of low-income households and factory workers - Increase of the role of private sector - Keeping housing prices low - Effective maintenance of existing stock

(Shin, 2005)

7.3 List of expert interviews

Institution	Department	Name	Function	Date
Public sector				
Land and Housing corporation (LH)	Spatial environment team, green landscape architecture office	Lee, W.J.	Manager	24-6-2010
Ministry of Land, Transportation and Maritime affairs (MLTM)	Overseas construction division	Jun, S.B.	Deputy director (until recently, employed at national housing fund team)	11-7-2010
Seoul metropolitan SH corporation (SH)	Architecture team 1	Jin, S.H.	General manager	30-6-2010
Private sector				
Hyundai Development Company, engineering and construction	Business development	Lee, H.T.	Manager	12-7-2010
ING Real Estate Investment Management	Korea	Ahn, B.	Country manager Korea, Managing director	21-6-2010
Jones Lang LaSalle	Korea	Saul, S.	Chairman	21-6-2010
Maxmakers, real estate and infrastructure consulting	Korea	Hussain, T.	Country representative	22-6-2010
ING Real Estate Investment Management	Korea	Ahn, B.	Country manager Korea, Managing director	21-6-2010
Jones Lang LaSalle	Korea	Saul, S.	Chairman	21-6-2010
Maxmakers, real estate and infrastructure consulting	Korea	Hussain, T.	Country representative	22-6-2010
Research sector				
European Union Chamber of Commerce (EUCC)	Korea	Jun, H.L.	Director Real Estate Committee	28-6-2010
Seoul Development Institute (SDI)	Metropolitan planning research group	Jang, Y.H.	Senior research fellow	1-7-2010
Hanyang University	Department of Urban Planning	Lee, C.M.	Associate professor	5-7-2010

7.4 List of datasets

7.4.1 CBS

CBS, Centraal Bureau voor de Statistiek (2010) *Statline* [WWW]. Available from: http://statline.cbs.nl

Bevolking, huishoudens en bevolkingsontwikkeling; vanaf 1899 (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=37556&D1=45&D2=61,71,81,91,101,l&HDR=G1&STB=T&VW=T [Accessed 30-1-2011].

Bevolking; kerncijfers (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=37296ned&D1=52-56&D2=0,10,20,30,40,50,(l-1)-l&VW=T [Accessed 10-1-2011].

Bevolkingsontwikkeling (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=37259NED&D1=0&D2=0&D3=9,11-13&D4=0,5,10,15,20,25,30,35,40,45&HDR=T&STB=G2,G1,G3&VW=T [Accessed 10-1-2011].

Regionale kerncijfers Nederland (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=70072NED&D1=0,111,119,342-343&D2=0,9,11-13&D3=10&HDR=T&STB=G1,G2&VW=T [Accessed 31-12-2010].

Regionale kerncijfers Nederland (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=70072NED&D1=111,119-122&D2=0,9,11-13&D3=12&HDR=T&STB=G1,G2&VW=T [Accessed 10-1-2011].

Regionale kerncijfers Nederland (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=70072NED&D1=118&D2=0,2,14,41,123&D3=5&HDR=T&STB=G1,G2&VW=T [Accessed 11-1-2011].

Woningen; hoofdbewoner/huishouden (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=7409WBO&D1=1-2,6-8&D2=0,11-13&D3=17-18&D4=2&HDR=T&STB=G1,G2,G3&VW=T and http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=7409WBO&D1=9-14,19-30&D2=0,9,11-13&D3=0&D4=4&HDR=T&STB=G1,G2,G3&VW=T [Accessed 21-1-2011].

Woningvoorraad op 31 december (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=71477ned&D1=0&D2=0,9,11-13&D3=a&HDR=T,G2&STB=G1&VW=T [Accessed 24-12-2010].

Woningvoorraad op 31 december 1947-2009 (edited) [WWW]. Available from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=71477ned&D1=0&D2=0&D3=a&HDR=T,G2&STB=G1&VW=T [Accessed 11-10-2010].

7.4.2 UNDP

UNDP, United Nations Development Programme (2010) *The human development index* [WWW]. Available from: http://hdr.undp.org/

Human development index and its components [WWW]. Available from: http://hdr.undp.org/en/media/HDR_2010_EN_Table1_reprint.pdf [Accessed 22-11-2010].

The human development index [WWW]. Available from: http://hdr.undp.org/en/statistics/hdi/ [Accessed 22-11-2010].

7.4.3 UNPD

UNPD, United Nations Population Division (2009) *World population prospect: the 2008 revision* [WWW]. Available from: http://data.un.org/

World population prospect: the 2008 revision (edited) [WWW]. Available from: http://esa.un.org/unpp/ [Accessed 4-12-2010].

World population prospect: the 2008 revision, total fertility rate [WWW]. Available from: http://data.un.org/Data.aspx?q=fertility&d=PopDiv&f=variableID:54 [Accessed 4-12-2010].

World population prospect: the 2008 revision, net migration [WWW]. Available from: http://data.un.org/Data.aspx?q=migration&d=PopDiv&f=variableID:84 [Accessed 4-12-2010].

World population prospect: the 2008 revision, life expectancy at birth [WWW]. Available from: http://data.un.org/Data.aspx?q=life+expectancy&d=PopDiv&f=variableID:68 [Accessed 4-12-2010].

World population prospect: the 2008 revision, population density (edited) [WWW]. Available from: http://data.un.org/Data.aspx?q=population+density&d=PopDiv&f=variableID:14 [Accessed 14-12-2010].

7.4.4 World Bank

WORLD BANK (2009) *World development indicators 2009* [WWW]. Available from: http://data.un.org/

World development indicators 2009, GDP (edited) [WWW]. Available from: http://data.un.org/Data.aspx?q=gdp&d=WDI&f=Indicator_Code:NY.GDP.MKTP.CD [Accessed 20-9-2010].

World development indicators 2009, GNI per capita, PPP (edited) [WWW]. Available from: http://data.un.org/Data.aspx?q=gni+ppp&d=WDI&f=Indicator_Code:NY.GNP.PCAP.PP.CD [Accessed 1-12-2010].