Erasmus University Rotterdam
Erasmus School of Economics
September 2010

Developments in Residential Mobility on Dutch Housing markets

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Summary

In this Master thesis you will find an analysis of the governmental interventions in the Dutch Housing market during the past decades. With the use of a graphical model the effects of policy are being explained from a theoretical economic perspective. Afterwards the implications suggested are tested with the use of turnover and transaction data for the period 1998-2007. The main conclusion of the research is declining residential dynamics in Dutch Housing markets which partially can be explained by lower dynamics in the rental sectors in the last few years of the data-set. The suggested causes are a lack of incentives for investors to exploit rental homes because of price regulations within this sector and a friction in consumer costs between rental and owner-occupied homes. All in all the policies result in disequilibria in the housing markets and lessens residential movements.

Summary

Content

1 Structure and purpose of the study

1.1 Introduction

The Dutch housing market is according to many economists, politicians and tax lawyers jammed. This is according to a recent study (May 2008) by the Dutch Central planning Bureau (CPB) mainly due to Governmental intervenient. The National government is actively intervening directly via subsidies and taxes and indirectly via housing corporations. These government linked corporations are participating on the real estate market, both in the rental and the sales segments. Many of the different policies influence the traditional equilibrium mechanisms and distort the free competitive market mechanisms.

Housing corporations, who until recently mainly provided rental housing, are not only seen in the Netherlands but also in other European countries. Originally these companies were private initiatives of wealthy citizens aimed at providing better housing for factory-workers. Due to the industrialization people often lived in miserable circumstances, as the quality of housing was very poor and multiple families living packed in small houses or slums was more rule than rare. The Dutch Housing law of 1901 made it possible for these associations, in case they were only active on the housing market, to become a so called "authorized institution" and thereby an organisation that falls directly under the authority of the Dutch Government. These non-profit organisations benefited from this construction as they got easy access to capital and started to receive subsidies. Next to these, municipal organisations directly initiated by the government were set up.

In the aftermath of the Second World War the excess demand, caused by the destruction of a substantial part of the stock and the baby boom, became more apparent. This fact substantiated by arguments like the stimulation of employment, living as a 'merit good', improvement of the supply and control of spatial aspects intensified the governmental intervention.

The housing associations tried, with the use of standardized building, to foresee the market in this growing demand. In this period almost all developments are worked out entirely with the help of subsidies. The Dutch government also started with a rent control policy, fixing the rent prices to the 1940 level. The costs of building (up 300% in 1950 compared to 1940) and also loans started to grow fast after the end of the war. As a

result especially smaller home-owners, who were dependant on the incomes they gathered with rents, got into financial trouble. Private building initiatives became less attractive as rents were no longer sufficient to cover the costs (Ramakers, 1987). These rent controls are at the moment still in use and the restriction on private rent prices, according to the research by Schilders and Conijn in 2009, created large gaps between the market price of a rental home and the exploitation value. This makes private initiatives, as mentioned before, still not very lucrative.

A consequence of these policies is that Dutch housing corporations now own about 38% of the total Dutch housing stock and provide 80% of total rental dwellings. The large supply and limited flow has led to a wide range of people living in the social rental dwellings from low to high- income groups. A Dutch phenomenon often cited is the so called "skewed housing", that is when people who earn enough to pay for a more expensive house rather keep living in the cheaper one they already occupy. For instance the percentage of price regulated housing that is occupied by households that earn more than 30.000 euro a year is 29% (Woon, 2006). The reason of course is that the low-rent prices do not encourage them to move.

Furthermore these and other governmental policies have influenced the housing markets in ways that led to a large gap between the accessibility of renting or owning a house (Schilders, Conijn 2009). These low costs of social rental dwellings compared to the costs of buying a house has led to large waiting lists, especially in cities like Utrecht (app. 7 yrs) and Amsterdam (app. 10 yrs), and a lack of dynamics (Hoek, 2009). This imposes a negative effect on the possibilities of low-income "newcomers" like young adults to obtain a dwelling and lessens overall movements.

The mutual effects of different housing policies are seen as the cause of immobility on the housing market in the Netherlands. All in all one could therefore wonder whether the policies can still be seen as useful and relevant for the Dutch market and are able to tackle the goals they were originally initiated for. Also the role of housing associations herein can be questioned as we find a lower tendency of people to move whenever they have found a cheap rental dwelling even if they earn a lot more in later years.

The Dutch Social Economic Council (SER) concludes also the role of government in the realisation of new homes should be revisited as it is contributing to a mismatch between demand and supply on the sales market. Next to that the amount of new build housing is declining and especially in the rental market much too small to answer demand. Eichholtz

(2008) therefore expects the total excess demand for housing in the Netherlands to reach 800.000 dwellings in 2015.

1.2 Problem statement and questions

The Dutch housing market is according to many specialists experiencing a growing lack of dynamics which is presumably caused by different regulations and a mismatch between demand and supply. Politicians are reluctant in taking too rigorous measures to increase the degree of dynamics as it will affect a large amount of (if not every) citizens and would make themselves unpopular with their adherents. Still in case this development is a factual problem the problems have to be solved. It is therefore important to learn where these problems are most severe and what the most important causes are.
I have transformed this problem statement in the following **main question**:

Are Dutch cities experiencing a growing lack of dynamics in the housing market and how can this be explained?

Partial questions:

1. How can the dynamics of a housing market be measured?
2. How are Dutch housing market dynamics related to regulations?
3. How has overall dynamics developed in Dutch cities in the last twenty years?
4. How can the differences in dynamics be explained and what role do regulations play?
5. How can the development of the private rental and social rental sector be related to the developments in dynamics?

Objectives

- To make an objective analysis of the developments in terms of dynamics of Dutch urban housing markets
- To detect and explain the differences in urban housing markets dynamics
- To contribute in the discussion with the use of a scientific paper on housing market dynamics

2 Dynamics of the housing markets

2.1 What's dynamics?

A dynamical housing market has everything to do with the mobility of people active on this market. The possibilities to move towards another region or street within a region or to move towards another housing tenure type, whenever the person (agent) feels the need to go live there. This "need", can have different causes but often seems to fall within certain patterns. One popular term often cited is the so called "housing career", which primarily has to do with transitions between different phases of life caused by several life events (Dieleman and Mulder 2002).

In the current life-cycle view five different stadia can be distinguished: younger, moving out of the parental home, married or cohabiting, having children and the final stadium is when your own children move out. Instead of the traditional path, when youth stayed with their parents until their marriage, nowadays a large proportion of young adults first start living on their own (Harmsen en Schapendonk-Maas, 2001). This group, after leaving their parental home, prefer accommodations with high accessibility to social networks, recreational opportunities and "marriage markets" (Glaeser, Kolko and Saiz, 2000). This group therefore more often makes movements within and towards core cities, with the availability of small inner-city apartments and studio's (Martens, 2004).

Young singles and young two-person households seem to be particularly eager to move. They are socially mobile and likely to make progress in their household and labour-market careers. Many youngsters want to stay flexible and therefore purposely choose strategies enabling them to keep this flexibility (Mulder and Manting, 1994).

In the second stage when they start moving in together their preferences towards location and living-size already start to change and they will want to move towards a location with other facilities more aimed at their (future) children. They will therefore often choose single-family homes in suburban areas. Finally people move when their children leave and space needs decline, or health concerns come into play. A research done on the more wealthy seniors (about 2/3 of the total group of seniors) between the age of 50-75 in the Netherlands shows that the largest part (80%) still live in family-homes and not often in villages (13%). Although the largest part (55%) would want to live in an apartment. Most of the persons have an intention to move within 2 years

(75%). The most important reasons are health (23%), financial (20%) and retirement (19%). A large part of the elderly (42%) though seems unable to fulfil their housing wishes because of financial limitations (Verhue et al, 2008).

Other reasons why someone would leave and move towards another location are often work-related, divorce/the end of a relationship, or the living environment. The most important reasons for Netherlanders to move are: family extension (15%), moving in together (20%) or leaving the parental home (25%) (Ekamper and Huis, 2005). Job related relocations, not sighted in this research, seem to be an important motive as well and very important in the functioning of the job-markets. Growing evidence is found on the relationship between housing market immobility and unemployment rates (Dohmen, 2000).
One proxy for immobility often used is: the proportion of home-owners, as these are on average less mobile (Oswald, 1996). Reasons for this abstention can lie in the positive fiscal treatment of home-ownership which is especially relevant for the Netherlands. The Dutch international competitiveness in this light is a very important issue in the desirability of a dynamical housing market. Other more social reasons that were already mentioned in the introduction are the low inflow of "newcomers", excess demand and skewed housing.

Residential movements can be restricted in many ways, making the person unable to make the desired decision. One can for instance think of financial restrictions as was already seen for elderly. Another can be housing market opportunities which differ regionally; especially the shortage of housing in the Randstad (Amsterdam, Utrecht, Rotterdam and The Hague) seems to dampen the mobility (Clark & Dieleman, 1996).
This shortage is a consequence of both building activities and demographic changes which result in changing demands. The number of households has in the Netherlands for instance increased from 3.2 million in 1960 to 7,3 million in 2009. On the other hand the average household size has decreased from 3,6 persons to 2,3 which is the result of a lower number of children parents have (CBS 2005). These developments are of course restricted by the total housing stock which has increased but may not have sufficiently to deal with the changing demands. In case insufficient alternatives emerge, the number of households "trapped" and dissatisfied may rise.

An interesting research has been done by de Groot et al. in 2007, in which they estimate the difference between the amount of people that have an intention to move and the actual moving behaviour in the Netherlands. They find that about 1/3 of those who expressed an intention to move actually did so within two years thereafter. They mention that during the search process people can be discouraged in finding a suitable and affordable dwelling. In that case an alternative for moving is to stay in the present dwelling. This is especially true for job-changes, which make people willing to move but often do not result in actual moving behaviour (Kan, 1999), thereby also making the job-market less flexible.

The decision not to move could be seen as evidence of an immobile housing market even if the initial intention has been "unrealistic". In this view it does not matter whether the house wished for is just or way out of ones' reach. The "stuckness" of the Dutch housing market in this sense can then partially also be a matter of perception. With this I mean that for instance the "need" or intention of newcomers to buy or rent a home in one of their favourite cities can have grown and therefore more of them are being disappointed. In real terms the amount of movements within cities might not have declined much. Evidence for this view can for instance be found in growing demands in terms of size, quality and location due to economic growth (Vrom, 2007). The reason why relocations are correlated with economic growth is that normally a housing career means that people incrementally move towards their ideal home (Michelson, 1977). A rising income will therefore trigger a move, especially to higher-priced alternatives or from rented to owner-occupied accommodation (Deurloo et al, 1994).

2.2 How then measure dynamics?

In order to make the lack and development of dynamics measurable one should make use of objective standards. In general terms dynamics can be seen as the movements on a housing market. Possible movements in terms of tenure types are from; rental to rental, rental to sales, sales to rental and sales to sales. Some of these movements will not take place as often as others. For instance the movement from a private home towards a rental home is often accompanied by economical setback. (Helderman, 2007) Movements can furthermore be between or within regions/markets.

The sum of the movements as a percentage of total population in a previously defined housing market can for instance be used as an objective measure of the mobility in that housing market. From another perspective one could also take the amount of years people live on the same address as a measure of immobility. Officially population dynamics is measured by the turnover rate: the sum of the movements and migrations divided by the average population of that year. In this view regular movements count double as regard to migrations as in the first case both the addresses are within the same pre-defined region. And leaving ones house creates opportunities for someone else to move as well.

A dynamical housing market will be one in which a relatively large proportion of relocations as a percentage of total average population takes place.

The turnover rate is a good indicator of housing demand (Berkovec and Goodman (1996)) and is often used for explaining local market differences in dynamics (e.g. Dieleman, (2000), Van der Vlist et al., (2002), Strassmann (1991)). Also in this research as will become clear later an important objective is explaining the local market differences. Instead of comparing the calculated numbers to a reference measure, as is for instance done in research on labour dynamics. The relative outcomes within the Netherlands will be most important. The main reason is that the locality of markets which is due to both local and country-specific characteristics does not allow for easy benchmarking. For instance the comparison of European markets already show large differences in relative mobility (Van Sommeren, 2006).

The relevancy of turnover rates as an important variable of market performance already becomes clear in the distinction made by Dieleman (2000) between 'hot' and 'cold' housing markets, in which the hot markets have high turnover rates while the cold markets have low. Local market characteristics are of course important as certain markets might because of a better initial allocation or less changing preferences be less dynamic without being less efficient. Therefore explaining the causes of markets being either hot or cold will be an objective of this research.

As mentioned before and concluded for instance in the research by Henley (1998), a well functioning housing market that provides an adequate turnover of residential property in

the various tenure types will also assist the efficient matching of jobs and enables people to take advantage of labour market opportunities. The interrelation between an efficient housing market and the job matching process is therefore clearly relevant and can trough this process also affect economic growth (Mayo and Stein, 1995). A decline in the mobility on a local or national level therefore indicates worsening growth potential.
Policy herein plays an important role as it is able to influence the mobility by regulations. As explained by Hardmann and Ioannides (1999) who in their research analyze the impact of price setting and residential mobility on economic growth in a neoclassical setting. They conclude that not only people in rent controlled or public housing consume suboptimal levels of this good but under the assumption of an optimal capital/labour ratio also negatively effect economic growth as lower mobility will result in a higher ratio.

The data and methodology by which the research is set-up will later be explained further. In the next section the focus will be on market regulations and the way it influences residential mobility. The discussion will start by making a distinction between different tenure types and their costs of living.

3 The relation between regulations and dynamics

Dutch regulations on the housing market are comprehensive, exist in many forms and serve many different goals. In this section an overview will be given of the most important laws and regulations and their suggested effects on housing market dynamics. Instead of summing up the implemented rules I will directly explain their impact on the demand and supply of housing in a graphical setting. Starting from the demand-side I will explain the effects of several regulations on user-costs. Afterwards supply-side policies will be handled with.

3.1 Mobility from a user costs perspective

From the discussions in the earlier sections it can be concluded that moving is a result of disequilibrium in someone's housing consumption. Changing preferences influence the friction between actual and optimal consumption and the greater the gain of adjusting the amount of consumption by moving the greater the probability of doing so. Normally a market is comprised of both sellers and buyers who all have different valuations of the available housing within a market. In case a buyer valuates a house above the sellers' valuation a transaction takes place. Lower bids can occur in case the mismatch between the current and the ideal home is higher. In this setting the government plays a role by influencing the costs of players and thereby influencing the matching process.

Discussion in the Netherlands on the lack of dynamics is often focused on the movements between tenure types, which for certain groups are easier to make than for others. Mentioned already in the introduction is the gap between the costs of rental and private dwellings. The costs made by the users of these two tenure types are very different and therefore need further explanation.
In case someone chooses to rent a house the only costs he faces are the monthly rental payments. The buyer of a house will often need the help of a financial institution and will thus opt for a mortgage. He then has to pay interest (im) on the contracted loan (M). On top of that he looses forgone interest (i) on the money he himself has invested. Next to these, the owner has to pay maintenance costs (C), property taxes (t) and faces the risks coherent with the possession of a house. These risks can be comprehensive but mainly concerns the possible positive and negative price developments of the asset (ΔQ)

(Presscott, 1997). Finally, governmental regulations can have both positive and negative effects on the total costs of both tenure types.

Although often seen that way (Ben-Shahar 2004), home-ownership in itself has no financial superiority over renting. In fact in a free market setting with rational agents the home owner equivalent rental price should equal the price the agent would have to pay whenever he rented the house. In reality both the transfer and living costs for sales and rental housing differ, for some income-groups even more than for others. Much has to do with the intervention of government and this affects the mobility within markets. Cost differences exist and can be seen as one of the reasons why in reality home owners are less mobile than renters (Dohmen, 2000).

User costs in the Netherlands are affected by multiple interventions that affect both the renter and owner-groups. These cost differences can be seen as one of the reasons why in reality home-owners are less mobile than renters.

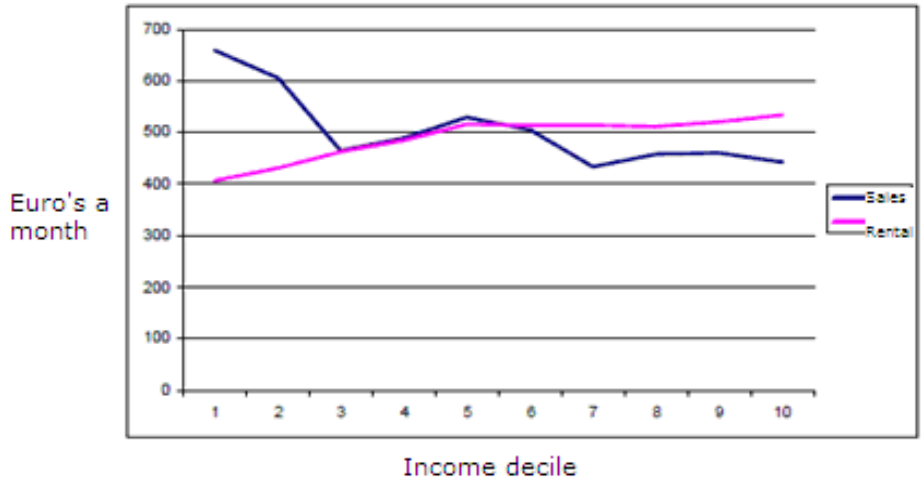
Dutch renters have since 2006 access to a rent-subsidy which is dependant on the receivers' age, income and the rental price. The user-costs therefore become rent price – subsidy = costs.

A buyer receives a subsidy in the form of preferential tax treatment of mortgage interests, which can be deducted from taxable income for a maximum period of thirty years. The benefit of this policy depends on the persons' personal marginal tax rate (λ). Therefore the user costs (rental price) for the owner of a house becomes: $C + (1-\lambda)Mim + (Q - M)i + (1-\lambda)t - \Delta Q$. This is a slightly revised version of Presscott (1997) because under Dutch tax law rent-income is not taxed directly.

From this equation it is already clear that people benefit differently from this tax treatment as they buy houses of different prices, use different financing constructions and most importantly have different tax levels. The progressive tax system means that higher-earners pay a higher marginal tax-level on their top-income. On the other hand their marginal benefit from the treatment is higher as a deduction will also be on the top of their taxable-income.

In a research done by Schilder and Conijn (2009) the actual user costs of both tenure types for Dutch income-groups is calculated. Although dependant on the assumptions made, especially the expected yearly-price-increase and choice of quality, the costs differences resemble the following path.

Fig 1: User costs in euro's per month per income decile



Source: Schilder and Conijn (2009)

This estimation shows that on average renting (pink) is much cheaper for lower income groups than buying and buying is relatively cheaper for high-income groups than for low-income groups. These cost differences dampens the mobility between tenure types and makes it harder for "newcomers" to obtain their first private home.

According to the same research subsidizing a renter will lower his chance of moving significantly. The results of their model show that an increase of the implicit subsidy of 1000 euro on a yearly basis dampens the chance of moving by 1,3%. A growing gap would therefore result in lower relocations by tenants.

Next to the subsidizing of low-income families the government has inserted two different ways in which she regulates the prices of rental dwellings which further increases the gap between the user costs of both tenure types. First of all the social housing corporations already mentioned in the introduction often demand rents far beneath the actual market prices. In 2008 the corporations altogether charged rental prices 71% (CFV) of the maximum allowed according to the WWS (PropertyValueSystem). The WWS is another policy implemented in 1979 as part of the price regulations by the government. The foremost goal of this policy initially was to close the gap between rental prices of the existing stock and new supply.

The WWS regulates the rental prices of housing in both the social and private sector for dwellings that according to objective measures do not exceed a certain threshold quality-

level. Houses that by the use of a scoring card exceed the threshold quality level are liberalised and owners are able to ask whichever rent the "market" is willing to pay.

It is therefore very useful to have a look at the differences between the average rental price in the social housing sector, which was about €398,- a month in 2008, and the actual market price. The market price for a dwelling can be derived from the WOZ-value. The WOZ is the yearly estimated value by the municipal tax-department. The market rental price estimated by economists is 4,5% of the WOZ-value. The Dutch Central Planning Bureau even assumes 5,7% of the WOZ- value in its' calculations. Because the average WOZ-value of social housing in 2008 was €155.105,-, the market rental price would have been between €581,65 (economists) and €736,75 (CPB). This is of course a lot higher than the prices asked leading to an excess demand for social housing and the long waiting lists already mentioned before.

Transaction costs

The final important regulation that influences mobility from the demand side is the transfer tax. This tax has been implemented already during the Spanish dominance in the 16th century to bear the expenses of military support against lootings by hostile groups. Nowadays it is just seen as a welcome supplement to total tax income.

This law obligates anyone who buys a house to pay a tax equal to 6% of the total purchase price. The effect is thus automatically a sharp increase in the transaction costs and can therefore mainly be seen as a mobility tax (Hoek, 2009). As anyone who shortly after the purchase of a house wants to move again looses the total sum of transaction costs, which including notary costs amount about 10% of the purchase price.

Transaction costs and the impact on residential mobility in the Netherlands has also explicitly been investigated by Leuvensteijn and Van Ommeren, in a report for the Dutch Central planning bureau in 2003 they conclude that a 1% increase in transaction costs - as a percentage of the value of the residence– decreases ownership-to-ownership mobility by 8%.

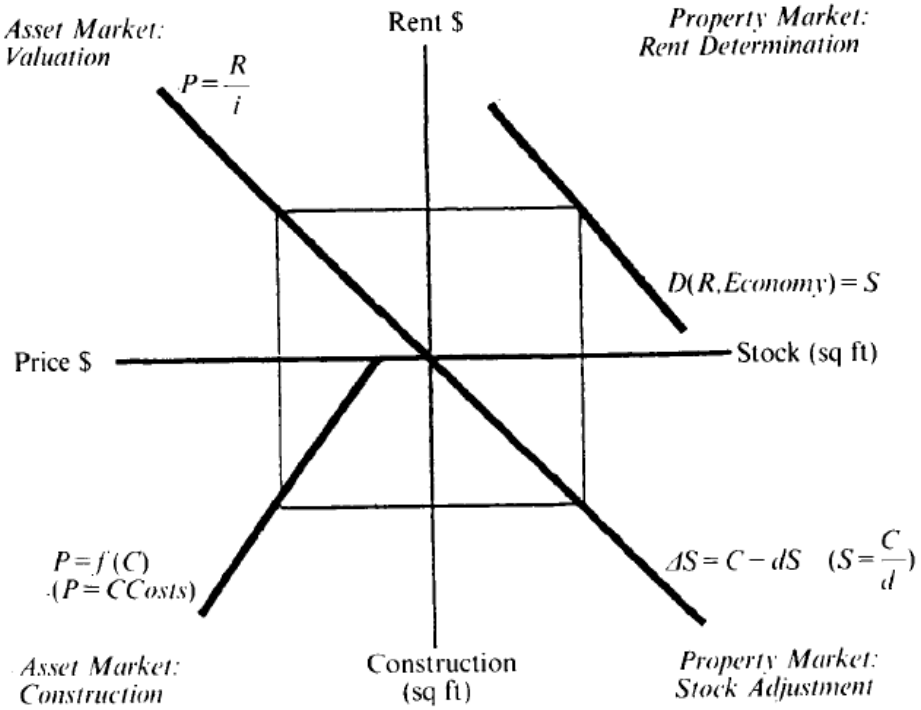
3.2 Supply side

An interesting aspect of housing is that it can function both as consumption good and as an investment good. This duality results in different types of players active on the

market: the renter, the owner-occupier and the investor. With the use of a model constructed by DiPasquale and Wheaton (1992) the simple workings of a real estate market on macro level and the influence of governmental intervention can be analysed. Within this model the different players active on this market are recognized and a distinction is made between real estate space and real estate as an asset. This model can through the connection between these markets and mediation of prices determine the friction between demand and supply.

In the determination of the user-costs it was already mentioned the owner-occupier faces a financial risk because of the possession of a home. An investor in this market faces the same risk in case he decides to exploit the dwelling. Next to that he faces positive cash flows in the form of rents and the same negative cash-flows already seen for the owner-occupier. Both the price developments and present value of all future income streams determine the exploitation value for the investor. One can imagine price regulations have had negative effects on the returns of these investors in the rental market.

Fig 2: Model of real estate dynamics



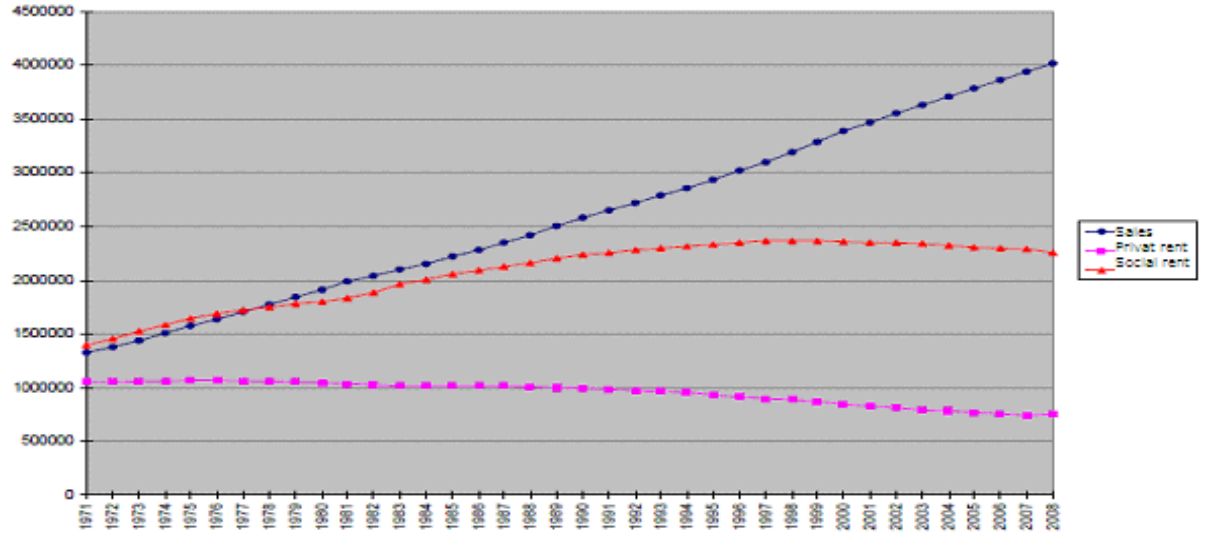
Source: DiPasquale and Wheaton (1992)

Starting in the square at the upper-right, a given housing stock and a demand function that is dependent on both rent level and economic circumstances can be related to an equilibrium rent level. The rent level in this model equals the income of the investor and will thus in the upper-left section dependent on the investors capitalization rate determine the investors valuation of the real estate. In the lower-left section a construction costs function is given which in equilibrium should equal the investors determined value. Finally in the lower-right section the change of stock can be determined which is dependent on both the new construction and depreciation. In case the investors' valuation is higher than the price of constructing, new stock will be added and a new rental price will come about. In case the rental price is restricted to a lower level than equilibrium the demand for housing will exceed supply and the adjustment process tells us that no new supply is added and dependent on the speed of depreciation a new equilibrium with a lower stock will eventually emerge.

Schilder and Conijn in 2009 estimated the gap between the market-values and the exploitation values of the social housing stock. They conclude, given their assumptions, that in 2006 when the average WOZ-value was €151.000 while the average exploitation value was €33.000 a total difference of €118.000. This is not a striking result as the main goal for these corporations is not to make profits but to provide housing for citizens that are not or insufficiently able to foresee themselves in proper accommodation. And these social companies do not pay that much attention on rent prices when they build homes. Although on the long term they will have to as well as will be explained in the next section.

A gloss that has to be made by the exploitation value of housing corporations are larger management costs and maintenance expenses compared to private parties. Private investors on the other hand do strive for reasonable profits, comparable with other available investment opportunities. Their returns came under pressure by price regulations as well and have led to a decreasing supply of private rental housing. The overall fraction of owner-occupied homes has increased from 43% in 1986 till 59% in 2009 (WoOn, 2006). In total the housing stock has developed in the following way.

Fig 3: Development of the Dutch housing stock by sector



Source: Woon (2006)

Next to the growth of owner-occupied housing we see a decline in the private rental sector. The composition of the private rental stock is as follows, the ratio single-family homes/multi-family homes is 46/54. About 57% of the stock is located in the Randstad, the housing supply in cities is mostly multi-family while in the less urban areas you find more single-family homes (SYSWOV 2008)*. Institutional private investors who are organised in the IVBN seem to have put their focus on the liberalised sector and their regulated stock has been declining since several years. Their current regulated stock though is still the larger part (57,3/42,7).

More pressure on this sector is put when price increases in the sales sector are not accompanied by higher rent-payments and gives investors the incentive to sell rental stock and capitalize their indirect returns. This example shows that the different markets are intertwined and influence each others equilibrium outcomes. In terms of residential mobility this should have effects as well. Because mentioned before the owner-occupier sector is much less mobile than the rental sector. The three markets where about the same size in the early seventies but have grown apart over the past thirty years. In case the hypotheses are correct therefore these changes should have resulted in less dynamics on the housing market.

*The Syswov is a databank set-up by the Ministry of VROM in which information is stored on the sizes and composition (tenure type, year, amount of room's etcetera) of the municipal housing stock

3.3 Production

Overall we see a large increase in the total housing stock, from 3.9 million in 1971 till 7.1 million in 2008, apparently though this growth has been insufficient to meet the total growth in demand. And one can state that in the Netherlands the actual construction output permanently lags behind compared to the demand. This has led to price increases in the sales market which have nearly tripled since the seventies. Therefore even though in the sales market, in contrary to the rental market, prices were able to increase no construction activities have been established that could offset this growth.
In the sales sector one would suggest a significant price-elasticity of supply, and the friction to loosen because of higher production on the longer term. Research by Vermeuelen and Rouwendal (2007) concludes that for the Dutch market this is not as logical as one would expect and they find an inelastic supply on the short term. Their estimations suggest an elasticity of supply of 0,04% to a price increase of 1% in the same year. And they find a long term elasticity that is negligible.
The characteristics of the market herein plays an important role as the financial risks involved are often large and construction has a long completion time. Other than that the organisation and construction-procedure in the Netherlands is quite cumbersome and can be identified as one of the causes. In a yearly monitor by the University of Delft, that tries to identify the bottlenecks in housing production, the complexity and needless long duration of decision-making processes ranks first. This has been the case already since the first monitor in 2003. The long objection procedure for citizens and interest groups comes second.

The Dutch ministry of VROM has tried with the use of a survey to estimate the differences between supply and demand on both the sales and rental market. Their results indicate an excess demand in almost all price-classes for both markets. The shortage of rental dwellings is highest in the segment close to the liberalisation-level where it amounted about 180.000 dwellings. The shortage in the sales market is now about 90.000 dwellings in the lower segment but has declined significantly since 2002. It amounted about 110.000 dwellings in the middle segment and is thereby a lot higher than in 2002.

Because of this structural gap in supply much pressure is put on the social corporations to fulfil the local housing needs. And they have been responsible for about 40% of new construction in recent years (CFV).
On the longer term though, they also will experience that the low rent levels are not sustainable in case they want to adhere to their current high levels of new construction. From the trend report 2008-2013 of the WSW, the Dutch guarantee for social investors, a few conclusions can be made. First of all less social housing corporations fulfil the financial requirements to get a guarantee of the WSW on their loans. They therefore have to pay higher interest rates in the market. Next to this the corporations are for their investments highly dependent on the sales of current stock and experience pinching cash flows. Therefore on the longer term it is expected they also have to adjust their investment ambitions.

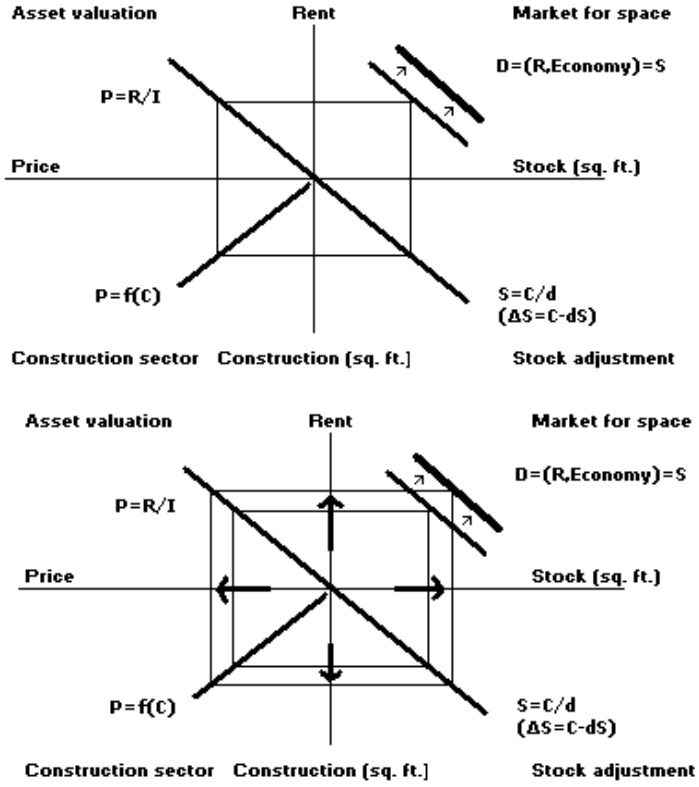
Finally, in contrary to the 6% transfer tax for existing stock, new build housing falls under the 19%-VAT tax regime. This tax is worn by the developer but automatically means an upward effect on the purchase price for the buyer. Therefore a new house is relatively more costly than an older one, as the house will two years after its' first occupation automatically fall into the 6% regime. The higher cost reduces the amount of houses built and thereby has a negative effect on the dynamics.

3.4 Summary

From a micro-level focus on this topic we can distinguish the user-costs of both renters and buyers. The government subsidizes both groups in different ways, as renters receive a rental-subsidy and home-owners get preferential tax treatment. The Dutch system furthermore knows a transfer tax which together with notary costs puts a large burden on moving and thereby dampens mobility within the sales sector. From the supply side the "stuckness" can be related to policies like rent-regulations that negatively influence the exploitation value of rental homes, spatial planning that influences the investment climate due to cumbersome production-procedures and a VAT-tax on newly built houses. These policies thus have its' effects on the workings of the market and result in different suboptimal equilibriums. In the model of Dipasquale and Wheaton the effects can be shown.

First of all an inelastic supply will result in higher prices in the sales market as suppliers are unable to fulfil the demand. Shown in the figure below a demand shift, for instance due to higher income or economic growth should in the short term result in a higher rent level for any given stock. On the longer term through asset valuation of investors and a given price of construction the supply will grow, reaching a new equilibrium. But in case the construction is somehow constrained, a higher demand can only result in higher prices. This is mainly what has happened in the sales sector over the past decades resulting in large price increases. (market prices more than tripled since the 70's)

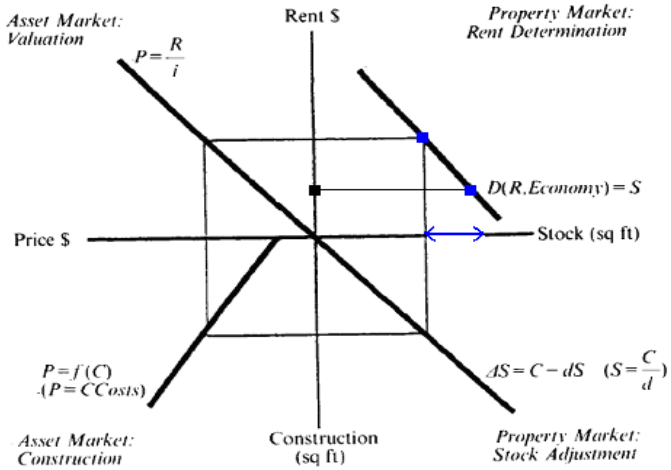
Fig 4: Demand shock



Source: DiPasquale and Wheaton (1992), modified by author

In the rental sector the opposite has occurred. The rent-levels have been set at a given rate which was lower than the equilibrium level. This will result in an excess demand, indicated by the blue arrows in figure 5. The lower valuation in the rental market affects profits in this market and in case the property is worth more in the sales market investors might decide to sell. Equilibrium within the rental sector is not reached as the stock will decline even further because of depreciation and sales.

Fig 5: Price regulations in the rental sector



Source: DiPasquale and Wheaton (1992), modified by author

A new equilibrium in the sales sector can occur in case the selling of rental stock is able to fulfil the higher demands in the sales sector, which could not be reached because of bottlenecks in construction. But this is of course not a beatific solution and will not solve structural dysfunctions.

A well-functioning housing market should therefore be in equilibrium in both the rental and the sales sector. The social sector is different from these two as the investors on this market do not behave like rational investors. Still they are able to influence the equilibriums in the other markets by changing the stock sizes in other markets through purchases, sales or construction. A well functioning-market would be able to absorb these shocks through prices. Current sales by the social housing corporations give them large profits because of the disbalance between their internal exploitation value and sales prices. In terms of equilibrium it will have two effects, the disequilibrium within the social sector will grow but on the other hand it helps to foresee partially the demand in the sales sector. One can see that the overall tendence is a move towards privately-owned housing with less residential dynamics because of the functioning of this market under current circumstances.

In the next section the dynamics of the Dutch housing market will be investigated thereafter the developments as described above will be related to the dynamics and tested empirically.

4 How has housing market dynamics developed in Dutch cities in the last twenty years?

Now that we have seen some of the bottlenecks which are created due to regulations, a short introduction into dynamics between markets is given based on other research results. My own contribution that will be more objective basing the dynamics primarily on movements on municipal level will follow thereafter. I will in first instance explain on the data-sets used in this research where the usefulness and limitations of the data will receive special attention. Afterwards I will proceed on National and regional figures on dynamics and explain the developments.

4.1 Dynamics between markets

The Dutch government has performed several housing researches in which with the use of surveys insight in the wishes and actual behaviour of citizens is obtained. One of the results found is related to the concern I put forward in the previous chapter that houses in the sales market become too expensive, especially for first-time-buyers. In reality the researches do not find an actual decline in the amount of dwellings bought in the period 1997 till 2009 by this group. Measures taken by the government to subsidize this group cannot be accounted for the result as these measures where taken mainly after the year 2005, while the inflow of 2004 already resembled the amount of 1997.
One other option could be that these people because of a lack of possibilities in the rental sector choose to buy a house anyways and decide to deal with the higher costs involved. This option seems reasonable in case the rental sector is not able to fulfil the demand which seems to be the case looking at the waiting lists in the social sector and a declining private rental sector, especially in the lower segments as will be shown later.

In a research by Renes and Jokovi (2008) low mobility from rent to sales markets as a result of relative prices is becoming more apparent and at the moment mostly is an issue in the more tight housing markets in cities like Haarlem, Leiden and Amsterdam. Other markets that are characterised by a relatively larger supply like in the province Flevoland show a larger mobility between these sectors. Although the movements between sectors

are in the underlying research not taken into account as it will be mainly focused on movements in general, the suggestion of an interaction effect between the tightness of the market and the degree of dynamism of the rental market can be investigated.

4.2 Data on dynamics

On the website of the Central Bureau of statistics data can be found on the total amount of relocations per 1000 citizens per municipality in the Netherlands. The data provided ranges from 1988-2008 and contains all relocations within, towards and outwards Dutch municipalities. With this data the dynamics as defined in part I can be measured. Next to these the data allows investigation of trends in the dynamics within and between municipalities with different characteristics like size and location. The data also lends itself to be related to general data on municipalities like the total amount of housing stock, the amount of social housing or to the fraction of sales to rental markets. Using these kinds of statistics helps to explain the effects regulations are presumed to have on residential mobility.
Limitations of this data are the lack of personal characteristics of the movers. The total amount of relocations does not tell which groups experience the least mobility. This kind of data would make it possible to distinct between: gender, age, income or household size to detect the bottlenecks in terms group mobility.
On the other hand the richness of the data allows relating the development of dynamics with the development of market sizes making it possible to measure the effects over several years. In order to make statements on dynamics in the different markets further data on transactions provided by the Dutch land registry service and data on social housing allocations are used.

The Cadastre collects the data of all housing transactions within the Netherlands. I have access to the data of transactions to private persons from 1997-2009 for all Dutch municipalities. The transaction data on private homes can be used as a proxy for mobility on the sales market. In this sense a similar proxy of dynamics will be used.

A dynamical housing market will be one in which a relatively large proportion of housing transactions as a percentage of total average population/housing stock takes place.

Finally the development in dynamics in the rental market is important. To see whether a significant decline in the dynamics within the social rental sector is a factual problem I will analyse data from the CFV on the amount of housing allocations by social housing corporations. In total the data of 360 of these corporations for the period 2002-2008 is analyzed. A broad approach in this part will be used as this data is collected only on corporation level and thus no in depth analysis on municipal level is possible. A relevant measure to investigate the development of mobility within this sector:

The amount of housing allocations as a percentage of the total housing stock

The largest restriction to this and also other research is the lack of data on the private rental sector. No public or private organisation collects this kind of data on a substantial scale. This segment can therefore be seen as a so called "blind spot" in the Dutch housing market.

4.3 Dynamics in the Netherlands in terms of relocations

The published data by the National Bureau of statistics contained many missing values for the range of the whole period (1988-2008). This is of course logical when we realize that many Dutch municipalities have been aggregated during this period. For instance in 1999 the Netherlands consisted of 538 municipalities while in 2009 there where only 441. These problems will on the other hand not influence the results for cities as these where much less likely to be merged. The cities that have been merged are left out in case this merger has influenced the data and the workings of the housing market severely.
Theoretically a city is defined as a place with more than 25.000 citizens. In this research also places with more than 10.000 citizens will be investigated. This enables to make comparisons between cities and municipalities of different sizes. The determination of the city size will be with reference year 2008.
The final data-set contained 309 municipalities from all twelve provinces. Because some areas are denser they also have larger representations of cities. Especially North and South Holland are better represented in the group with large cities. The only problem in terms of representation within the dataset can be found for the smaller municipalities in "Drenthe" and larger cities in "Friesland". Therefore no separate attention will be paid to these groups.

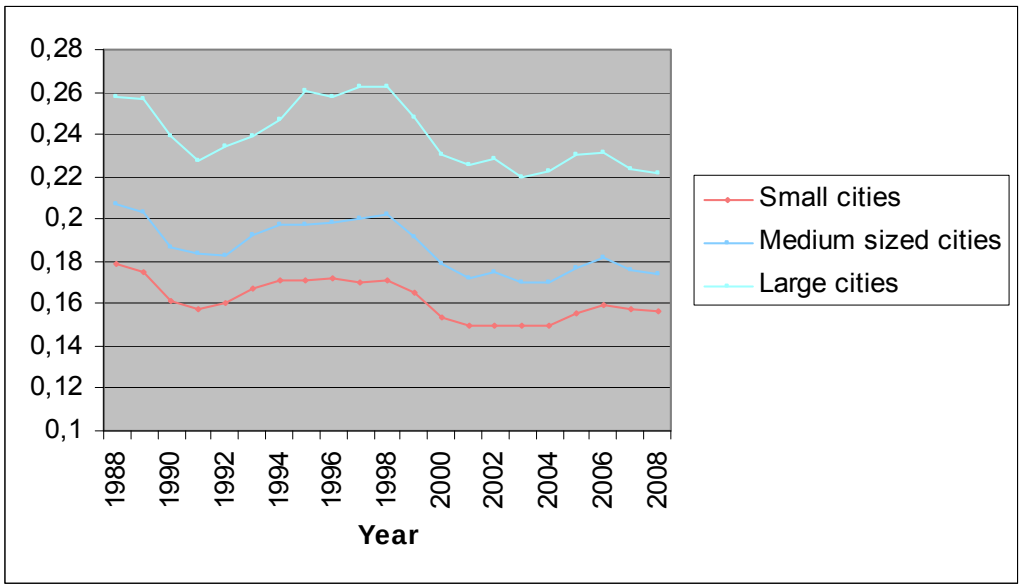
Fig 6: Cities within Data-set

	>10.000 - 25.000	25.000-50.000	>50.000	
1 Drenthe	0	2	3	
2 Overijssel	7	5	6	
3 Friesland	14	7	2	
4 Flevoland	2	2	2	
5 Zeeland	3	6	1	
6 N-Holland	21	12	12	
7 Z-Holland	28	14	13	
8 N-Brabant	20	17	8	
9 Groningen	11	4	1	
10 Limburg	11	6	4	
11 Utrecht	10	7	5	
12 Gelderland	16	21	6	
Totals	143	103	63	309

Comparison between city sizes

In this part the differences between the dynamics of cities of different sizes will be investigated. Here the focus will be on the turnover rate as a proxy for dynamics calculated as explained in the first section.

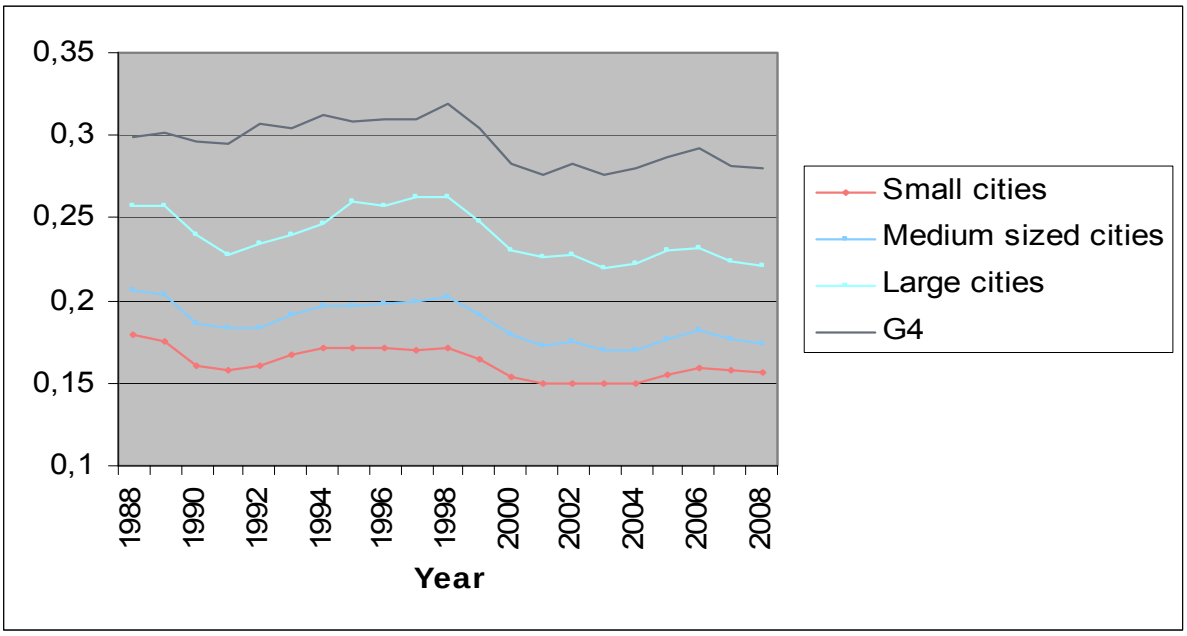
Fig 7: Turnover rates 1988-2008



We can see from the figure that the turnover rates for the different groups have developed in a similar way. Two years seem to stand out, the year 1991 can be seen as a start of an upward trend and the year 1998 seems to be a turning point in which the short upward trend breaks down. After this year the turnover rates decrease sharply for three consecutive years and stabilize afterwards. According to a research by VROM (2003b) the reason is a decline of the amount of movements in the rental sector of nearly 35% in the period 2000-2002 compared to 1998. The amount of movements in the sales sector as will be seen later has been constant.
The lower tendency of people in rental homes to buy a home seems to be the cause. A side-effect also is a lower inflow of first-movers into the rental sector. According to the same research the desire to move from an owner-occupied home towards a rental home has doubled over the same period. As explained before the development of user-costs herein play an important role. One can therefore conclude that these policies have had a visible negative effect on the dynamics.

Over the whole period taken the dynamics in the housing markets of Dutch cities seem to be declining. Furthermore it can be seen that the dynamics in large cities is higher than for medium and small sized cities. The local differences that cause these findings will be investigated in the next chapter. The ranking seems to be stable over time.
The average turnover rate for large cities is 3,6% lower in 2008 than in 1988, this means that in 2008 a lower proportion of people moved within these cities over the period of one year. This is a decline of -14% over the investigated period. The smallest cities have experienced the smallest decline within this period: -12,3%, the decline for medium sized cities was largest and amounts -15,6%.
When we separate out the four most important "Randstad" cities (Amsterdam, Rotterdam, Utrecht, The Hague) in the Netherlands, we see that the dynamics within this region is even higher. The region has an average turnover rate of 29,5% and has experienced a minor decline compared to the other groups (-6%) over the whole investigated period. The growing "stuckness" therefore thus not seems to be a large-city-problem but is a phenomenon on the Dutch housing market as a whole.

Fig 8: Turnover rates including G4 (1988-2008)



This is not as expected and as explained in the introduction most often the suggested decline of dynamics in cities like Utrecht and Amsterdam catches the attention when dynamics of the Dutch housing market is discussed. While they in fact seem to hold-up quite well relatively. Stuckness in these cities for a large part therefore seems subjective and the growing attractiveness of living in these cities results in more people being disappointed even though the cities perform relatively well.

The average rates for the different groups from small (1) to G4 (4) for the whole period are:

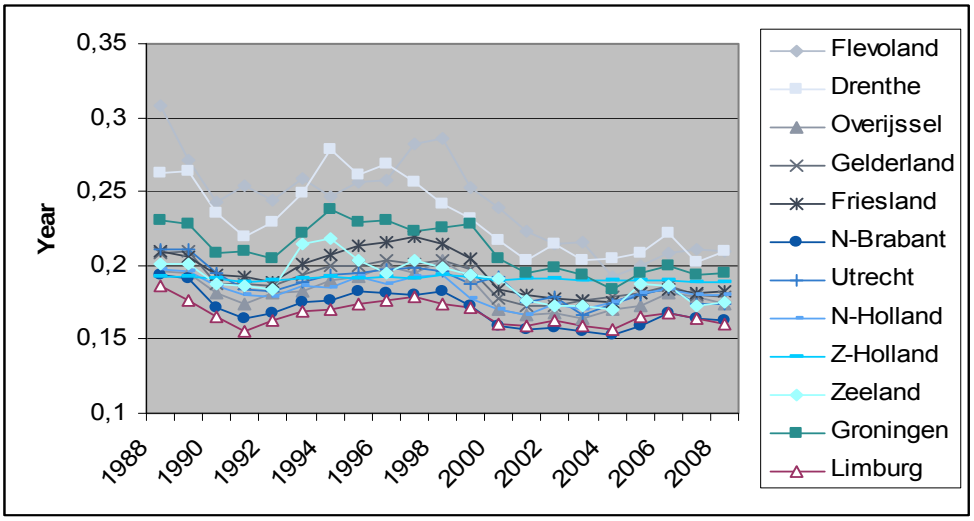
Group	Mean	Std. Deviation
1,00	,1619	,03516
2,00	,1845	,04085
3,00	,2355	,04600
4,00	,2954	,02506
Total	,1850	,04933

These differences are significant at the 5%-level.

Comparison between provinces

From the figure below it can be seen that indeed differences between provinces exist. On the other hand the rates seem to have moved towards each other over time. The Province with the largest turnover rate is Flevoland which has also experienced a large decline and moved more towards the average rates. This development is also as expected because a large part of this Province was only cultivated in the eighties.

Fig 9: Turnover rate 1988-2008 per province



Still a large part of the differences seem to be averaged out because of lower scale (city-level) differences. And heterogeneity between cities on a province level is still large. One explanation for this locality of housing markets can be found in the research done by Ekamper and Huis (2005). They have estimated the moving distances in the Netherlands for the year 2002 and find that on average people relocate 16km away from their former home and even less far in the Randstad, which is the region between the cities I have called G4. The largest distances are found for the younger that move for the first time. These relocations are often job or school related and the average moving distance is 28,6km. Also in the data-set it can be seen that the movements within municipalities form the largest part. Movements within cities account for about 47% of the total movements.

Rankings

The turnover rates do not give a clear picture on the development of dynamics on city level yet. It can therefore be interesting to have a closer look on the cities included in the sample to look for patterns and outliers. A ranking of the cities with the highest and lowest turnover rates are given in figures 10 and 11.

Fig 10: Cities with the lowest turnover rates in 1998 and 2008

	City	Province	Year	Group	Rate
1	**Tubbergen**	**Overijssel**	1988	1	0,094
2	**Edam-Volendam**	**N-Holland**	1988	2	0,107
3	**Bergen (L.)**	**Limburg**	1988	1	0,124
4	**Goedereede**	**Z-Holland**	1988	1	0,125
5	**Bunnik**	**Utrecht**	1988	1	0,126
6	**Rucphen**	**N-Brabant**	1988	1	0,126
7	**Montfoort**	**Utrecht**	1988	1	0,129
8	**Binnenmaas**	**Z-Holland**	1988	2	0,130
9	**Hattem**	**Gelderland**	1988	1	0,131
10	**Giessenlanden**	**Z-Holland**	1988	1	0,132
1	**Edam-Volendam**	**N-Holland**	2008	2	0,110
2	**Haaren**	**N-Brabant**	2008	1	0,111
3	**Haaksbergen**	**Overijssel**	2008	1	0,114
4	**Bernisse**	**Z-Holland**	2008	1	0,114
5	**Someren**	**N-Brabant**	2008	1	0,115
6	**Nieuwkoop**	**Z-Holland**	2008	2	0,116
7	**Oirschot**	**N-Brabant**	2008	1	0,119
8	**Stein (L.)**	**Limburg**	2008	2	0,120
9	**Tubbergen**	**Overijssel**	2008	1	0,121
10	**Nuenen, Gerwen en Nederwetten**	**N-Brabant**	2008	1	0,121

The cities with the lowest dynamics are not very interesting and as expected a lot of smaller cities and villages are represented in these lists. The average turnover rate is a bit lower in 2008 and only two out of ten appear in both rankings. Overall no other regularities can be found from this comparison.

Fig 11: Cities with the highest turnover rates in 1998 and 2008

1	**Zeewolde**	**Flevoland**	1988	1	0,501
2	**Groningen (gemeente)**	**Groningen**	1988	3	0,352
3	**Wageningen**	**Gelderland**	1988	2	0,348
4	**Arnhem**	**Gelderland**	1988	3	0,333
5	**Leeuwarden**	**Friesland**	1988	3	0,331
6	**Zwolle**	**Overijssel**	1988	3	0,327
7	**Assen**	**Drenthe**	1988	3	0,327
8	**Winschoten**	**Groningen**	1988	1	0,323
9	**Lelystad**	**Flevoland**	1988	3	0,315
10	**Rotterdam**	**Z-Holland**	1988	3	0,314

1	**Groningen (gemeente)**	**Groningen**	2008	3	0,368
2	**Leeuwarden**	**Friesland**	2008	3	0,315
3	**Utrecht (gemeente)**	**Utrecht**	2008	3	0,315
4	**Wageningen**	**Gelderland**	2008	2	0,298
5	**Arnhem**	**Gelderland**	2008	3	0,295
6	**Amsterdam**	**N-Holland**	2008	3	0,287
7	**Nijmegen**	**Gelderland**	2008	3	0,283
8	**Leiden**	**Z-Holland**	2008	3	0,275
9	**'s-Gravenhage (gemeente)**	**Z-Holland**	2008	3	0,272
10	**Enschede**	**Overijssel**	2008	3	0,263

The cities with the highest rankings were, especially for the year 1988, located in the less dense provinces. Interesting to see is that in 2008 Utrecht, Amsterdam and The Hague (s'Gravenhage) are all represented in the list. An interesting commonality is the representation of many of the large student cities like: Amsterdam, Wageningen, Groningen, Nijmegen, Utrecht and Leiden. Therefore one explanation of local differences could be the representation of certain populations like students.

In these two rankings especially the largest cities are very well represented. This does not necessarily mean that the allocations in these markets are more efficient in any point in time as well. As explained before it could for instance be the case that people within these markets more frequently experience changing preferences. The higher dynamics only suggest that people within these cities on average move more often and thereby have more opportunities to adapt to their changing preferences.

Change in dynamics

Even more interesting is the investigation of cities that have experienced the highest changes in terms of dynamics over the investigated period. This could show which cities in terms of dynamics have performed poorest over the past twenty-years. And might give a better idea where things go wrong. I have made calculations on 3-year average mutation rates, to control for large yearly fluctuations, for the different cities and compared the outcomes for the last three years with the first three years. A ranking on the development of dynamics of both the top and worst performing cities is given below.

Fig 12: Worst performing cities in terms of turnover rate change

	City	Change	Province	Group
1	Zeewolde	-0.42298	4	1
2	Maarssen	-0.39877	11	2
3	Wijk bij Duurstede	-0.39863	11	1
4	Delfzijl	-0.31789	9	2
5	Duiven	-0.31108	12	2
6	Spijkenisse	-0.31068	7	3
7	Zaltbommel	-0.30155	12	2
8	Hellevoetsluis	-0.29306	7	2
9	IJsselstein	-0.29199	11	2
10	Zevenaar	-0.28896	12	2

As can be seen not much large cities are found in this ranking and the two provinces Gelderland and Utrecht are represented both three times in this ranking. The reason why Zeewolde is on top of the first list is because it was founded in 1986 out of nothing, meaning that a lot of new houses were built that created the municipality and was by the end of the observation period functioning more average. In the statistical part of this research I will look for the common characteristics of these cities.

Fig 13: Top performing cities in terms of turnover rates change

	City	Change	Province	Group
1	Aalsmeer	0.467672	6	2
2	Barendrecht	0.444558	7	2
3	Uitgeest	0.30504	6	1
4	Heerde	0.194761	12	1
5	Laren (NH.)	0.173606	6	1
6	Krimpen aan den IJssel	0.17248	7	2
7	Maastricht	0.167331	10	3
8	Sint-Oedenrode	0.161797	8	1
9	Niedorp	0.149884	6	1
10	Hillegom	0.138435	7	1

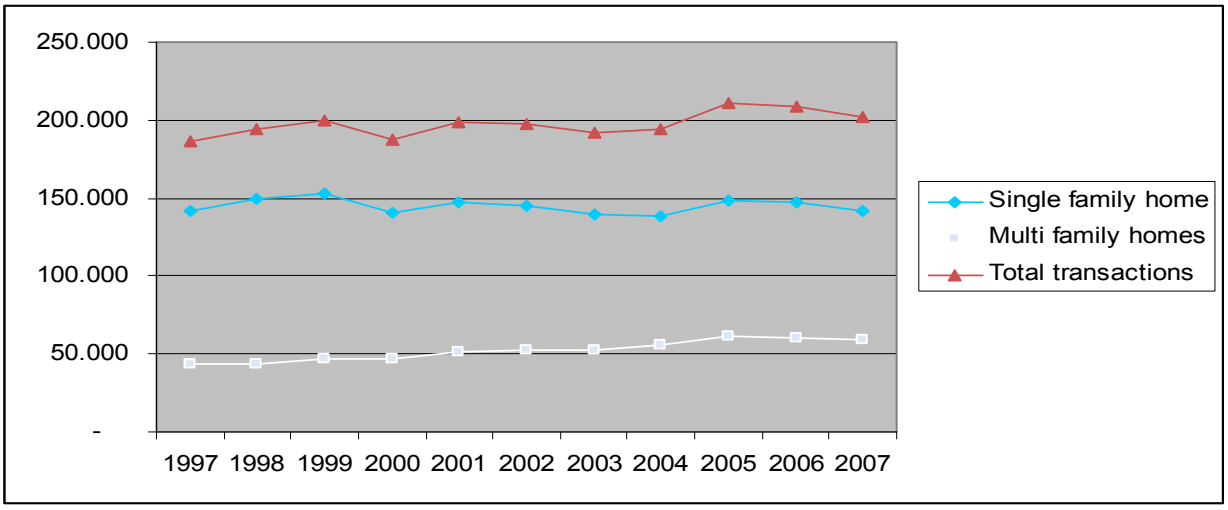
In this second ranking two cities stand out firmly and have experienced large increases in dynamics. Furthermore smaller cities are represented better. But these are also better represented in the total data-set.

4.4 Dynamics in the Netherlands in terms of transactions

In this section the dynamics in terms of transactions will be investigated. Starting with the total amount of transactions in the period 1997-2007, there is no real reduction

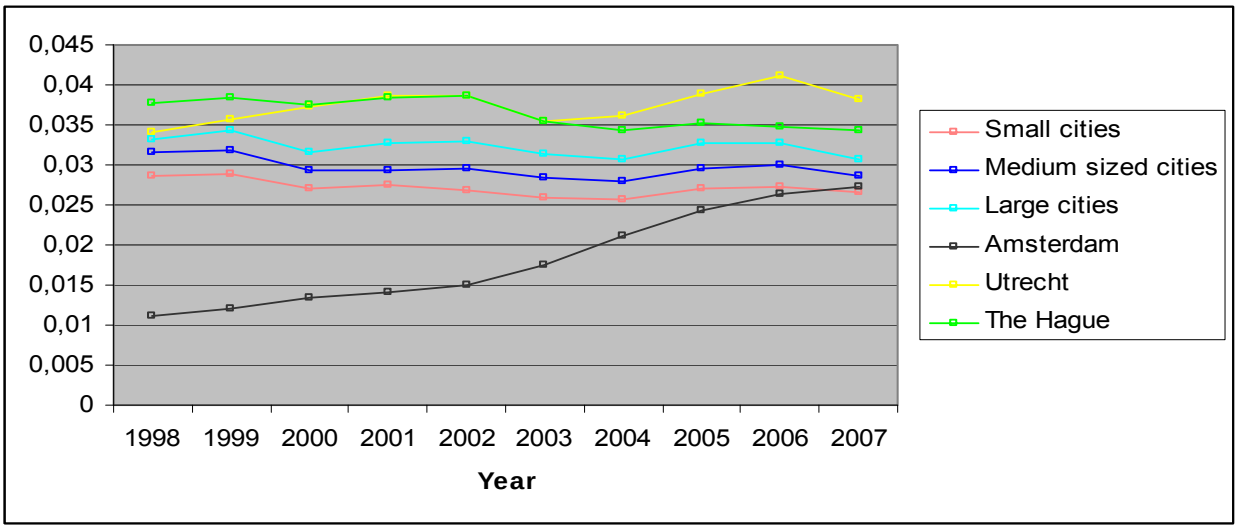
visible. The only development here is an increase in the transactions of smaller multiple-family houses.

Fig 14: Amount of transactions in the Netherlands between 1997-2007



Although there might be some bias as the amount of people that move in case of a transaction might have changed during the last decade, the decline in mutation rates over the investigated period seems to be mainly due to changes in the rental sectors. Evidence on this notation can be found in the high correlation between the amount of transactions and the amount of mutations of 0,958 (0.000). This suggests that the bias will be relatively small.

Fig 15: Transaction rates for different cities 1998-2007

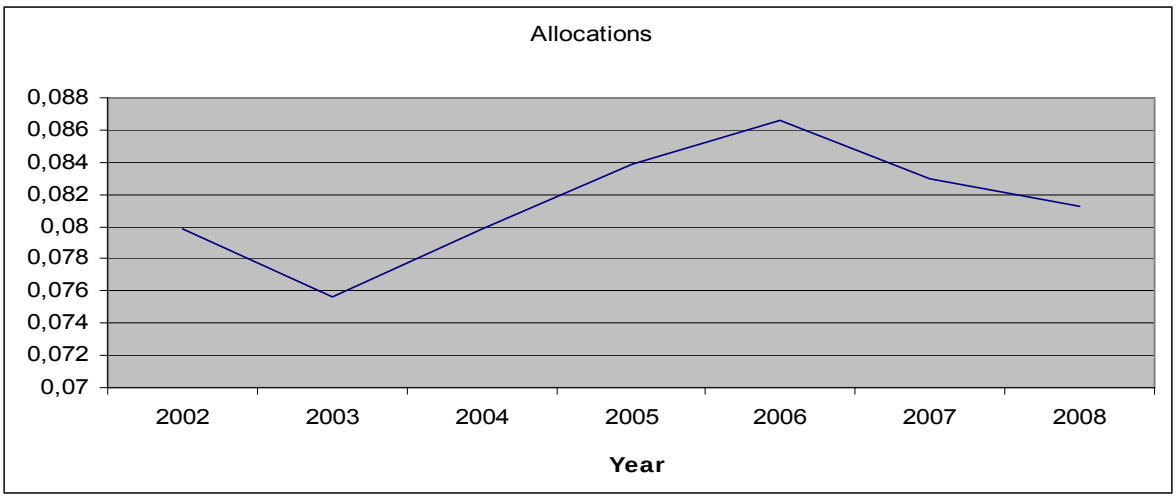


In terms of dynamics measured as the fraction of transactions to the total housing stock it can be seen that large cities perform on average better than small and medium sized. Amsterdam in this figure is a special case with a largely increasing amount of transactions. The reason for this development is a large change of the stock from rental to sales which is shown in the next chapter.

4.5 Dynamics in the Netherlands terms of housing allocations in the social sector

As can be seen from the figure below the amount of allocations in the social sector was in 2008 around the same level as in 2002. The year 2006 can be seen as a turning point after which the amount of allocations has been declining. Overall from this figure it cannot be concluded that the degree of "stuckness" within the social sector over the last few years has risen. The accuracy of this data is somewhat doubtful though as there have been many developments within the sector like mergers and a move towards more professionalism which might have changed the way in which some corporations administer their allocations. Skewed living as was explained before can still be relevant and allocations within the stock is important as will be shown next. Finally the role the sector plays in the overall dynamics will be subject to the next chapter.

Fig 16: Housing allocations in the social sector



In the following figure the total amount of allocations to low-income groups is shown. Clear in this figure is a strong decline over this short period, quantifying the difficulties newcomers encounter when trying to obtain a cheap social dwelling. This is as mentioned also one of the main concerns of politicians and tenants' interest groups.

Fig 17: Allocations of social housing corporations

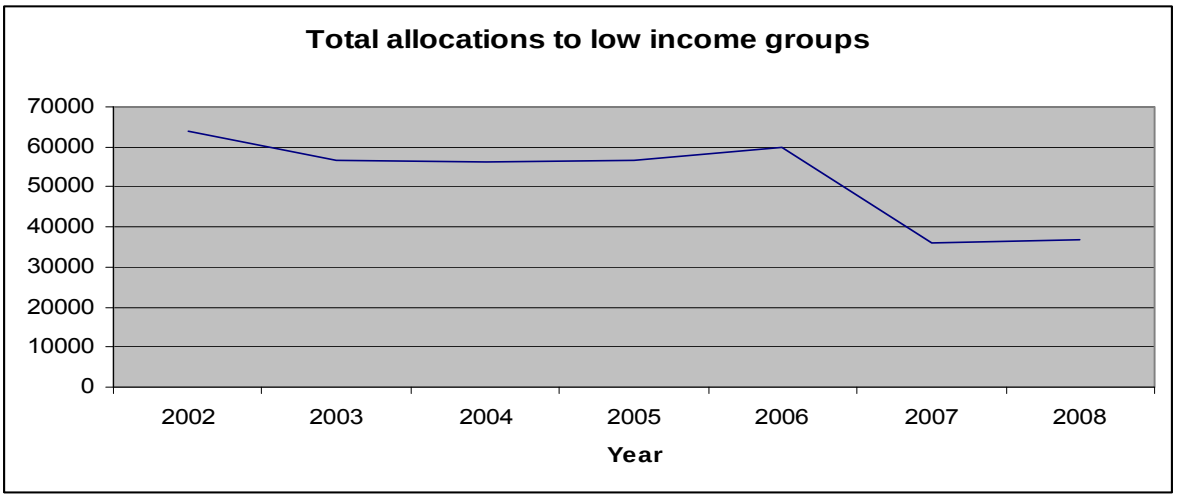
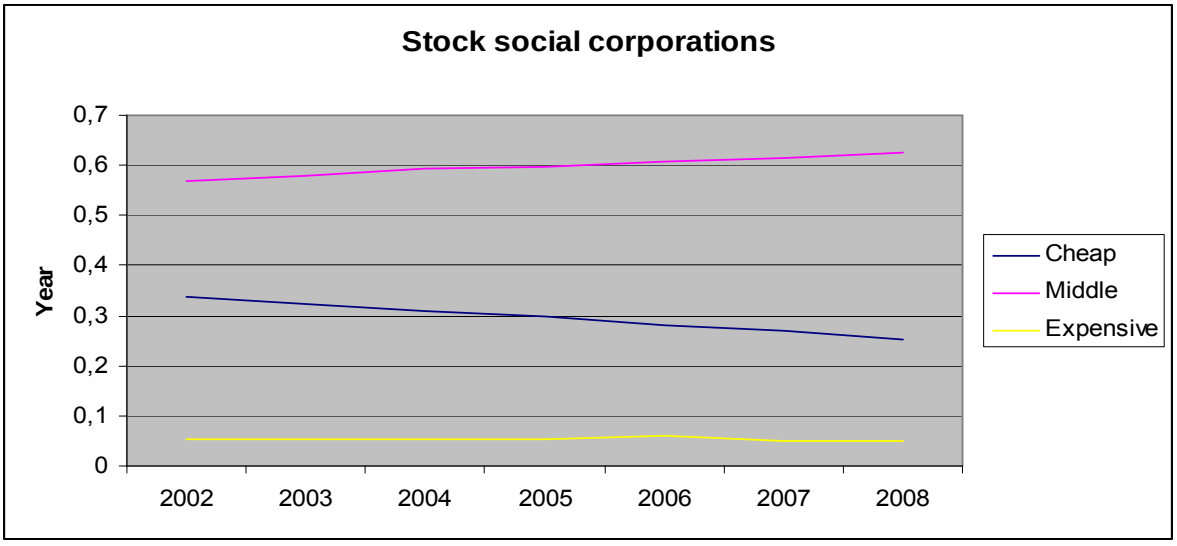


Fig 18: Stock of the social housing corporations



Finally in this light it is interesting to see how the stock of social housing corporations is developing. Very clear the move towards a more expensive stock is visible. The reason for this development mainly has to do with internal financial recitals. Both investing in more expensive housing and raising rent-levels for the existing stock is a common

approach to solve cash flow deficits. This conclusion can be made also based on experiences of the social inspections done on these social corporations by ECORYS Nederland B.V., who has performed a large part of these obligated internal researches in the past two years.

4.6 Summary

The dynamics of the Dutch housing market is in this research measured in three different ways. First and foremost is the turnover rate which captures all residential movements in the Netherlands on municipal level. Next are the amount of transactions and the amount of allocations in the social sector.

From the data it is clear that the total amount of movements has declined over the past twenty years, a development seen in all different sized cities and provinces. Overall large cities are more dynamic and especially the student-cities are very-well represented in the top-rankings. Furthermore the dynamics in the Randstad cities has declined less than other cities. This suggests that the relative "stuckness" in these cities is partially subjective.

The amount of transactions has been quite stable over the ten years investigated and is actually a little higher in 2007 compared to 1997. Therefore the decline in turnover rates is expected to be mainly related to the developments in the rental sector.

The amount of allocations has been very volatile over the investigated period, which is expected to be a result of the move towards more professionalism within this sector and more supervision over this sector. Still it can be concluded that the low-income groups are hurt most by changing allocation policies and stock development and are experiencing more difficulties in obtaining a dwelling within this sector.

5 Comparing the dynamics

In this section the collected data will be investigated. The locality of the housing market will be paid attention to and explanations will be given on the differences. Thereafter a model will be build that helps to explain the relations between regulations and dynamics as explained before.

5.1 Comparing the market sizes

The data on sales and rental market sizes were found in the SYSWOV data set published by the ministry of Living, Neighbourhoods and integration. Investigation of the data showed that some cases experienced irregular patterns. For instance a sudden drop in the private rental sector in the year 1998 for Midelharnis and Beesel, where in the last case it went to zero in one year. Next to these also Rucphen en Rozenburg where excluded for similar reasons.

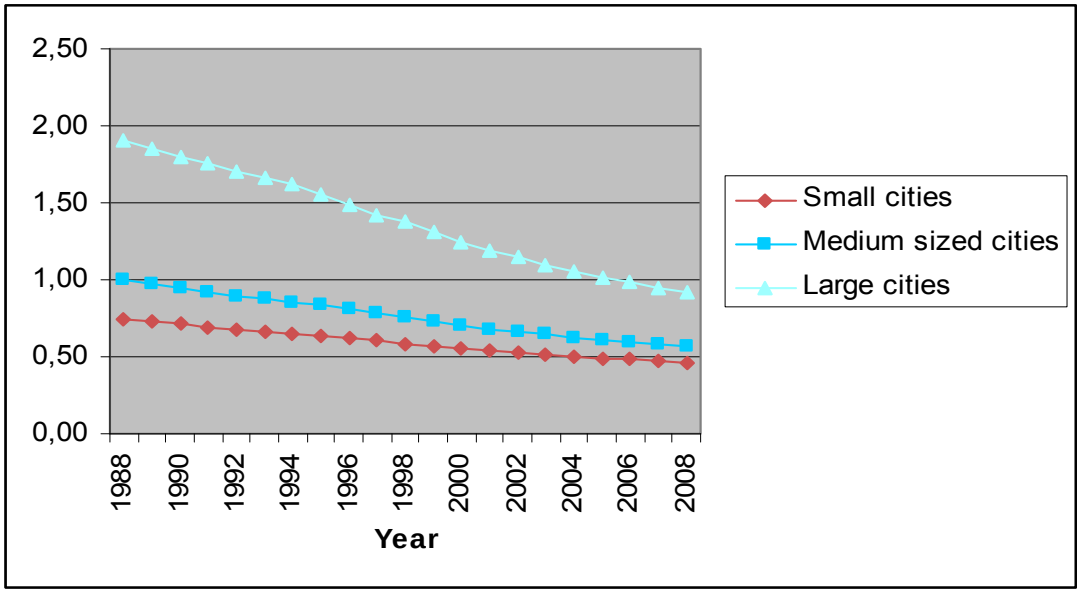
Overall large differences can be found in the fraction of rental markets to sales markets and private rental to social rental markets for the cities. This can again be explained by locality of housing markets. Ranking the cities gives insight in local market differences and lighting the "special" cases.

Fig 19: Cities with the highest fraction of rental markets in 1988

Amsterdam	1988	10,83	3
Rotterdam	1988	7,58	3
Gorinchem	1988	3,49	2
Schiedam	1988	3,44	3
Delft	1988	3,24	3

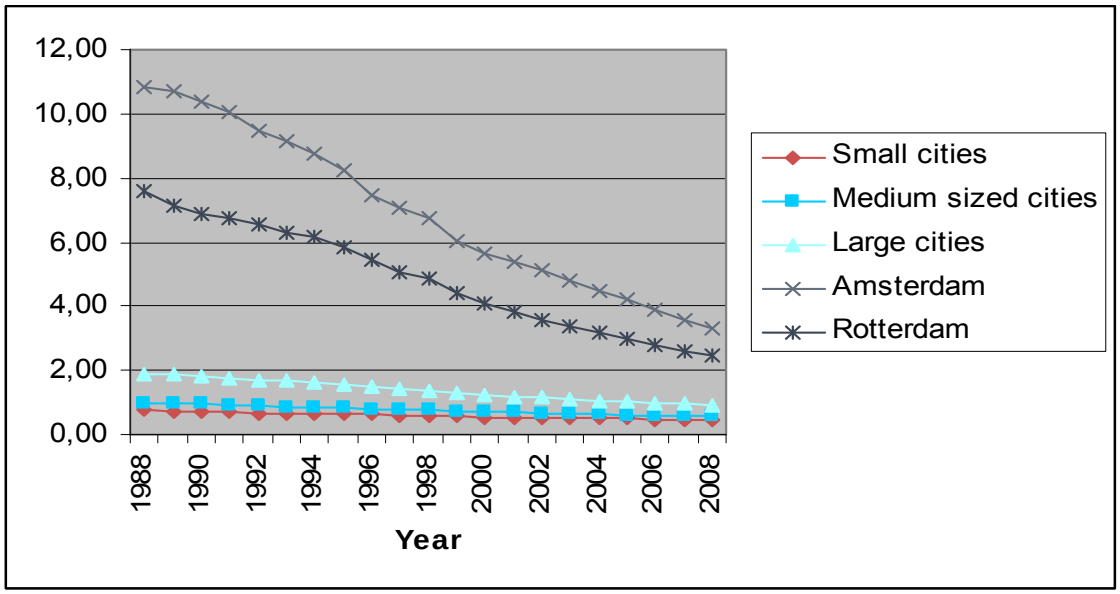
It is very interesting to see that Amsterdam and Rotterdam have a tradition of very large rental sectors far outweighing the sales sector. Overall the top rankers are large cities. The development of this variable, seen in figure 20, is expected to be related to the regulations imposed.

Fig 20: Trend in fraction rental/sales market for different city sizes 1988-2008



The decline of this fraction is again a national phenomenon, although it is largest for cities housing more than 25.000 citizens. Aggregation of the data might influence the results somewhat, as the two leaders of the ranking in 1988 have experienced the largest declines. But also when these are excluded the pattern seems to hold and is not very different from before.

Fig 21: Development of the rental/sales market in Rotterdam and Amsterdam 1988-2008



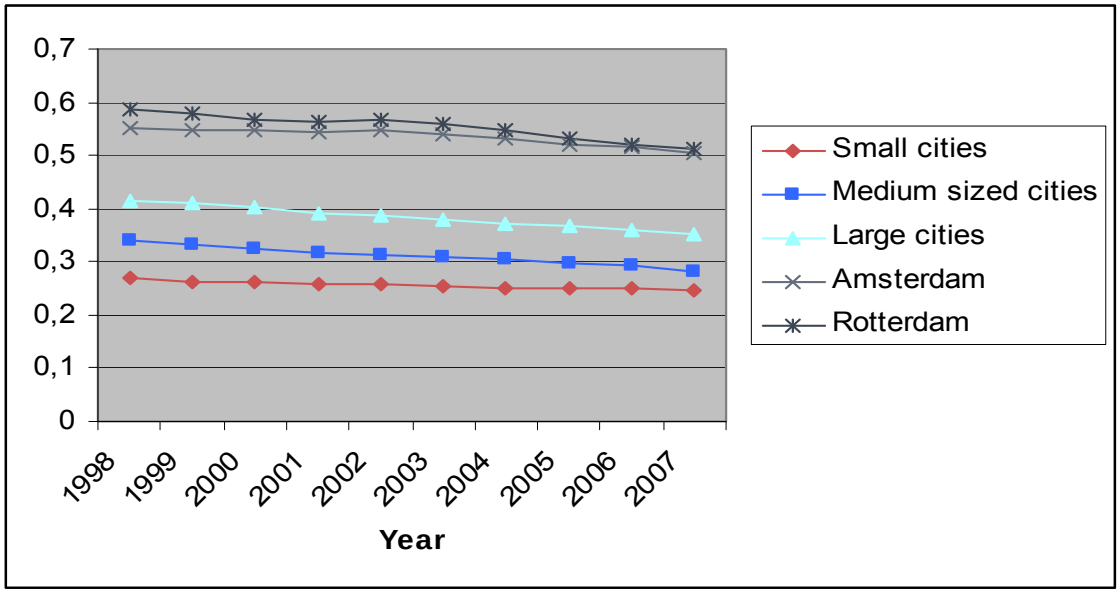
5.2 Comparison of the social housing sectors

The social sector is one of the main government interferences in the market and stems already from before WWII. Not only construction but also exploitation activities is organised by semi-governmental institutions. Problems arise when these corporations compete with private parties especially in the more lucrative higher priced segments, as they are able to defeat private parties in terms of costs because of public support. Not surprisingly therefore in August 2005 the European Commission concluded that these corporations received impermissible state aid. In the aftermath of this conclusion Minister Dekker in December 2005 notified the authorized housing corporations they had to split their commercial and private activities. The commercial activities have since 2006 been subdued to corporate taxes as well, to create 'level playing field' with other parties in this market segment.
In figure 12 I have shown that the amount of allocations to low-income groups dropped also in this year. Fear of these measures could be a cause in case the corporations are willing to take fewer risks by allocating homes to people who are more likely to default on their payments.

The size of the social sector is very different between cities, ranging from over twenty times the size of the private rental market to less than one. A lot has to do with the professionalism, size and the sense of responsibility of the social parties. When they do a good job in foreseeing the needs of citizens this automatically give less room for private initiatives. Also the cooperation with the town council, the size of private parties and local business climate influences the results. But as this research is focused on dynamics no in depth analysis will be given on the causes of local social supply differences. The focus will be on their effects in terms of dynamics.

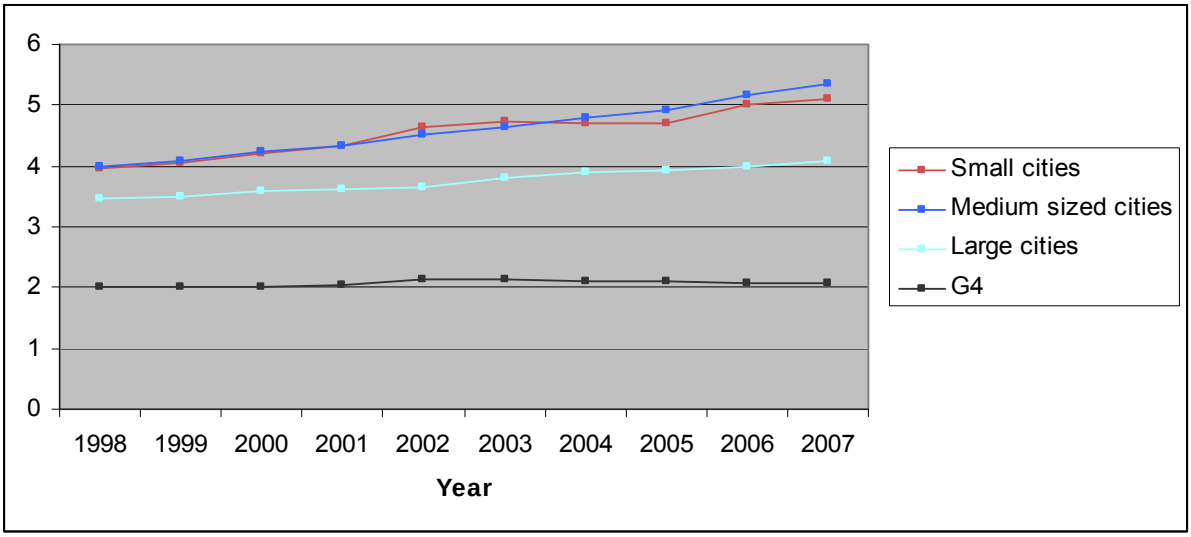
In the fractions social/private rental market again some irregularities have been found and some cities like Bergen (L.), Gilze en Rijen, Goirle and Neerijnen have been excluded. In the figure below the social supply as a fraction of the total housing stock is given for the different groups. Also the two large cities Rotterdam and Amsterdam are included. It can be seen that overall large cities have relatively larger social supply as a fraction of the total stock.

Fig 22: Fraction of social housing supply/Total housing stock (1998-2007)



When we look at the fraction of social rental market supply to the private supply it can be concluded that smaller cities score higher. This means that of the rental supply which in terms of total stock in smaller places is lower, it for a larger part consists of social supply.

Fig 23: Fraction of the social rental market/private rental market (1998-2007)



In the next part of the research we will see whether this difference helps to explain the differences between the turnover rates.

5.3 Dynamics in terms of turnover rates

In part I of the research I have given some explanations on why people tend to move and which kind of variables might influence the degree of dynamics. We have seen that relocation decisions are very personal and can have many causes but seemed to fit certain patterns.

A lot of research has been done on explaining residential mobility from a demand side perspective. The literature on this subject often followed the line of thinking of the classical paper by Rossi (1955), who shifted the focus to the individual decision level. Afterwards the emphasis has often been on the personal relocation decisions based on life course events (Clark and Dieleman 1996). From this research we learn that the age of a person and his or her wealth are important factors in an individuals' relocation decision. On a macro level therefore one can expect that the demographic compilation and the wealth in a local economy (Bier, 2001), help explain the amount of movements that take place.

As I have shown already the larger student cities which have on average the highest proportion of young citizens are also the most dynamic. Next to this finding, according to Ekamper and Huis (2002) Dutch citizens who are aged between 20 and 35 move most often. In order to capture this effect therefore an adequate age group had in this research to be defined. I will in the regressions make use of the age group: between 20 and 30 years, which according to me represents the group of newcomers and students very well.

In literature the link between local market differences and the degree of dynamics is not touched upon often. Research on the existence of differences has on the other hand been done (Dieleman, 2001). For instance, Dieleman (2000) tries to explain the causes of differences in turnover rates in the United States. He concludes that high construction rates and a large proportion of young people help to explain the results. Also the education-level within a market seems to be important as highly educated workers on average have higher mobility rates (Van Ommeren, 2000).

Strassmann (1991) includes the intervening role by governmental actions into this subject. He concludes that the more market intervention changes prices, the lower the will or ability of households to move.

Finally, more recent research that specifically focused on the Netherlands is done by Van der Vlist et al. in 2001. With the use of Survey data collected by the CBS in 1994 they try to explain some of the regulation related topics on residential mobility. Their focus is on local differences between residential mobility and factors like the sizes of the social housing and rental sectors are included as well.
In comparison to this research though they do not specifically focus on the effects of policy but use it as an explanation for local mobility differences. This means that they do not investigate all the relevant issues included in this paper and not specifically try to explain the bottlenecks in local mobility from a policy perspective. The dataset in this research covers in contrary to Van der Vlist et al. (2001), who have used data of one particular year, a period of twenty years and can therefore be used to explain the long-term developments in dynamics.

Other variables like the availability of housing, prices and the number of rooms (Clark et al. 1986) have been suggested. The availability will be measured by the total housing stock as a fraction of the population size. As suggested by Dieleman (2000) also the change in supply size, which he expects to be much more important than the total stock in itself will be included.
For the prices, available data that is representative for the whole stock is provided by municipalities. The accuracy of these already mentioned WOZ-values have been criticized, mainly because of the standard valuation method and the minor attention paid by municipalities in the past. Recent research by the TU-Delft on the relation between these values and market prices for the Province Overrijssel show a strong degree of consistency. Regression analyses show an R-squared of 86 percent in 1995 growing towards 91 percent in 2003. But still for the total data-set in this research the accuracy is doubtful.
In terms of regulations, the proportion of home-owners which is influenced by the personal user costs and the fraction of private rental housing which is influenced by price regulations and the interventions on the supply side by the provision of social housing by corporations, are the most important variables. Next to these the interaction effect which I suggested in section 4.1 will be investigated as well.

Building procedures as mentioned in section 3.3 are equal within the Netherlands although regional differences might exist between the completion-time of housing due to the degree of cooperativeness of local authorities. Factors like the amount and degree of objection by citizens and more project-specific circumstances play a role as well. But because the influences of these differences are hard to determine and no detailed data is available on these subjects they will not be taken into account in this paper.

The best way to deal with the data in this research is to use panel data analysis. With the use of dummy variables for the cities, thus fixing the within cross-section variation, the variation for cities over time can be investigated. This will provide a means of reducing the presence of omitted variables. The results then show the averaged effect for the different cities explaining the common effect of the variables on the turnover rate.
It would also be interesting to investigate between city variance over the years, thereby trying to capture the explanatory value of the variables on why some cities are more dynamic than others. This kind of analysis can be done with the use of simple OLS but has several limitations in the current setting. Because I think it is useful to start in this manner I have shown these results below as well as an explanation on why one should be cautious in interpreting the outcomes. Thereafter the panel results are given followed by the main conclusions of this research.

The model used here, that was well specified to explain between city variance for most years according to the Ramsey Reset outcome, is the following:
Mutationrate = C + B1*(Age20-30/Population) + B2*(Houses with less than 3 rooms/Housing stock) + B3*(Housing Stock/Population) + B4*(Private Rental stock/Housing stock) + B5*(New built housing / Housing stock) + U

Misspecification can have different causes but is likely when some variables have different effects in different situations, resulting in larger errors. The residuals in such a case correlate with one or more explanatory variables. For instance the social sector seems to cause misspecification, this could be when the effect of the social sector is not clear and might differ for specific housing markets. Even a dummy variable in which different effects of this variable in different sized cities is allowed does not improve the model and suggests this problem occurs on a more local level. Furthermore the R-squared is often low suggesting the likelihood of ommited variable bias. It could for

instance be that some of the variables pick up variation that would be captured by another variable if included. An example of such a variable that might have resulted in higher power but was not available is a measure for employment or availability of jobs in the region.

As can be seen Heteroskedasticity of the residuals is an even more severe problem in this setting and makes the estimated parameters are unbiased and consistent, but not efficient. This is because OLS places more weight on the observations with large error variances to minimize the total sum of squares of the residuals. This results in estimated variances that are not the minimum variances. Statistical tests with these variances are therefore not very reliable.

Fig 24: Regressions on mutation rate differences per year (309 Obs)

	1998	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
(Constant)	-0,044	-0,041	-0,014	-0,009	0,004	-0,001	0,017	0,009	0,006	0,008	-0,141
	(0.004)**	(0.004)**	(0.350)	(0.483)	(0.768)**	(0.958)	(0.136)	(0,357)	(0.579)	(0.469)	(0.000)**
Population 20to30	0,816	0,515	0,737	0,691	0,625	0,621	0,651	0,696	0,722	0,758	0,804
	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Less than 3 rooms / Housing stock	0,249	0,063	0,230	0,228	0,205	0,201	0,185	0,185	0,175	0,131	0,042
	(0.000)**	(0.093)*	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.103)
Housing stock / Population	0,097	0,094	0,081	0,072	0,083	0,100	0,067	0,074	0,095	0,113	0,496
	(0.000)**	(0.000)**	(0.028)**	(0.001)**	(0.000)**	(0.000)**	(0.002)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Private Rent / Housing stock	0,149	0,213	0,102	0,072	0,052	0,089	0,073	0,094	0,082	0,109	0,063
	(0.000)**	(0.000)**	(0.024)**	(0.076)*	(0.195)	(0.020)**	(0.039)**	(0.005)**	(0.021)**	(0.006)**	(0.056)*
Socrent/ Housing stock (group 1)		0,463									
		(0.302									
Socrent/ Housing stock (group 2)		0,432									
		(0.296)									
Socrent/ Housing stock (group 3)		-0,659									
		(0.127)									
New built housing / Housing stock	1,805	1,678	1,379	1,399	1,191	1,273	0,996	0,979	1,365	1,070	1,406
	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
R-squared	0,616	0,692	0,544	0,603	0,574	0,626	0,587	0,658	0,668	0,634	0,731
White Cross terms	2,724	2,943	2,474	2,683	3,518	2,635	4,132	4,013	4,083	6,722	1,715
	(0.000)**	(0.000)**	(0.001)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.031)**
Ramsey Reset test (2 fitted terms)	2,482	7,178	1,154	2,610	0,418	1,039	1,200	1,334	0,931	0,250	0,972
	(0.085)*	(0.001)**	(0.317)	(0.075)*	(0.659)	(0.355)	(0.303)	(0.265)	(0.395)	(0.779)	(0.379)
Log likelihood	5,054	14,538	2,360	5,313	0,857	2,134	2,454	2,736	1,905	0,512	1,990
	(0.080)*	(0.001)**	(0.307)	(0.070)*	(0.651)	(0.344)	(0.293)	(0.255)	(0.386)	(0.774)	(0.370)

Cross section fixed effects

As said before housing markets differ even on a local level. Evidence for this can be found in the above results as well. Therefore it is interesting to search for common effects while fixing cross-section effects. With the use of dummy variables the differences in several time-periods on city-level are investigated here. This means that the mutation rates are related to the other variables separately for the different cities thereby controlling for between city variance. Technically cross-section fixed effect allows the intercept in the regression model to vary cross-sectionally, which in this case means for the different cities.

The structure of the data asks for such an approach and the presence of heteroskedasticity is seen very often in such data-sets. But that these kind of data are hard to analyse was shown for instance by Beck and Katz (1995). They show that many economists underestimate parameter standard error terms. Ordinary Least Squares' requires homoskedasticity (same variances) and independence of error terms but as shown above this is not the case here. The error terms can be heteroskedastic across cities but also within cities over time or a combination of both, just as the effects of variables can differ between cities or within a city in different time periods. Dependency can be broken down in two forms as well:

In case error terms show spatial correlation (contemporaneous), errors in one city in a certain time period are correlated with errors in another city in the same time period. This could be because markets are interlinked. On top of that the effect can be different for different cities as the effect of one housing market on another will be larger when other cities are more nearby (heteroskedasticity). To some degree this could be an issue here but as mentioned before people often move over short distances and often within the local housing market. This suggests that the linkage between housing markets will not be very strong and therefore spatial correlation is assumed to be negligible here.

Autocorrelation is another potential problem and suggests that higher turnover rates in one year will have a positive effect on the turnover rates of the next year(s) because of the chain effects mentioned before. Therefore positive and of course also negative developments could have a lag effect.

In order to deal with these potential problems that might lead to incorrect standard errors and therefore either over- or insufficient confidence, several techniques to analyse panel data have been developed. One could for instance use a Cross-section SUR

weighted least squares on this specification, as suggested by Parks (1967). This is an often used GLS (maximum likelihood) estimator for systems where the residuals are both Cross-sectionally heteroskedastic and contemporaneously correlated. In case the amount of time periods is small relative to the cross-sections Beck and Katz (1995) suggested to use OLS with so called Panel corrected Standard Error's (PSCE). The reason is that Parks method first eliminates serial correlation of the errors by transforming the data, and assuming that the serial correlation of the errors followed an identical process for all units. Beck and Katz' results show that the panel corrected standard errors performed excellently in experiments with various combinations of heteroskedasticity and contemporaneous correlation of the errors and are more accurate than the Parks standard errors.

These two methods though seem to be inferior in case general correlation of residuals exists as is expected to be in this research. Therefore so-called panel cluster standard errors will be used. This method originated by Arellano (1987) is robust to heteroskedasticity in the cross-section and quite general forms of serial correlation over time.

Finally extending the fixed effect model by using time dummies as well has the further advantage of capturing any effects which vary over time but are common across the whole panel, for example when housing markets are affected by general economic shocks. The assumption made is that effects of these shocks are similar in housing markets. That this assumption is acceptable can for instance be seen by the current downfall in production and sales of homes due to the economic crisis which has been a general and not just a local phenomenon.

The specified models on the total data-set (3090 observations) are shown below. The r-squared has to be interpreted a little different than before as it does not measure only the power of the parameters but also the dummy variables and is therefore logically higher. The necessity of making use of fixed effects is given by a Likelihood ratio test and shown for every model.

From the results the following conclusions can be made:

First of all the amount of small houses does in first instance not seem to be related to the turnover rates. But as the model is optimized this variable changes and becomes significant in the final model (9) at the 10%-level. The amount of small houses thus seems to be important in explaining turnover rate differences on a city-level. A higher

amount of small-houses in one year compared to another is on average correlated with higher turnover rates on city-level.

The opposite effect is seen for the fraction of young population as the variable this time seems to get less important in case other variables are included. Especially the size of the social rent sector has a large influence on the size and as said before thus seems to catch part of the same variance. The variable has the expected positive sign but is in contrary to the result of Dieleman (2000), who measures between city effects, not significantly positively correlated with higher turnover rates within cities. Further explanation on this finding will be given shortly.

The result that the social sector is positively correlated with a higher turnover rate is similar to the earlier result of Vlist et al. (2001). The same effect is found for the private rental sector which has the expected sign as well. Therefore a common effect in this data-set is that larger fractions of both rental sectors are strongly correlated with more dynamics on a city-level.

Fig 25: Regression models after fixing cross-section effects (3090 Obs)

							Without 2007		Period Fixed
MODEL	1	2	3	4	5	6	7	8	9
(Constant)	0,097 (0.000)**	0,085 (0.000)**	0,077 (0.000)**	0,081 (0.000)**	0,110 (0.000)**	-0,019 (0.372)	-0,028 (0.307)	0,028 (0.179)	-0,013 (0.634)
Population 20to30	0,515 (0.000)**	0,510 (0.000)**	0,342 (0.000)**	0,279 (0.000)**	0,151 (0.029)**	0,088 (0.156)	0,091 (0.228)	-0,067 (0.305)	0,095 (0.387)
Less than 3 rooms / Housing stock	0,105 (0.250)	0,100 (0.276)	0,112 (0.066)*	0,116 (0.054)*	0,110 (0.065)**	0,040 (0.493)	0,048 (0.438)	0,080 (0.187)	0,112 (0.067)*
Housing stock / Population		0,033 (0.098)*	0,057 (0.001)**	0,056 (0.002)**	0,057 (0.002)**	0,057 (0.001)**	0,062 (0.017)**	0,051 (0.000)**	0,047 (0.000)**
New Built in year / Housing stock			1,437 (0.000)**	1,415 (0.000)**	1,418 (0.000)**	1,362 (0.000)**	1,385 (0.000)**	1,246 (0.000)**	1,226 (0.000)**
Regional economic growth				0,001 (0.000)**	0,001 (0.000)**	0,001 (0.000)**	0,001 (0.000)**	0,001 (0.000)**	0,000 (0.458)
Income					-0,001 (0.024)**	0,002 (0.000)**	0,002 (0.006)**	0,002 (0.002)**	0,001 (0.574)
Social Rent / Housing stock						0,310 (0.000)**	0,308 (0.000)**		0,310 (0.000)**
Private Rent / Housing stock						0,273 (0.000)**	0,274 (0.000)**		0,269 (0.000)**
Social Rent / Housing stock (-1)								0,226 (0.000)**	
Private Rent / Housing stock (-1)								0,187 (0.000)**	
R-squared	0,844	0,845	0,902	0,905	0,905	0,912	0,913	0,915	0,925
Log likelihood ratio	19,773 (0.000)**	19,185 (0.000)**	28,201 (0.000)**	29,092 (0.000)**	29,979 (0.000)**	27,626 (0.000)**	24,996 (0.000)**	26,599 (0.000)**	33,103 (0.000)**

The largest effect size is found for the amount of new built housing of which a 1% increase on average results in a 1,226% increase in turnover rate. This effect is likely due to the chain effects new houses create, as when someone leaves his home another one is able to move as well. According to Van Sommeren (2006) the amount of new-built houses only has short term effects as these chain effects would diminish over time. According to his results the larger part of movements is independent of developments in the housing stock. My results are contrary to his suggestion as I find a positive relation (at the 5%-level) between the size of the existing stock compared to the population and the turnover rates.

The "stuckness" issue thus seems to be relevant as dynamics is for a large part created by the availability of new housing. This could mean that indeed a lot of people would like to move but the current market does not foresee in their needs and no desired house is available. In case the regressions are done without the year 2007, which given the simple OLS results seemed necessary, the results do not seem to change and therefore I conclude that this years observations do not influence the overall results.

As can be seen in the above figure the effect of income as a fraction of the value is not taken into account in the models. This has several reasons, but first and foremost is because I found strange patterns in the value data which could be influenced by a different method of taxation over the years. I therefore doubt whether the variable is reliable for the data-set analysed.

The income variable as it is included in the models is just the average household-income per city. A higher income within a city is found to be positively correlated with the turnover rates in some models but not in the final. Furthermore the effect size is always very small. This can have different causes of which I expect the most important to be that it influences the intention to move differently in the sales market and the social rental market. For instance an owner-occupier can often, in case he receives a higher income, better fulfil his housing needs and therefore incrementally move towards a "better home". On the other hand more income in the social rental sector means that moving leads to higher costs and makes them unable to move within that sector. This is especially true for the later years as we have seen a growing gap between the user costs of social rental and owner-occupied homes. It could thus have a negative effect on mobility within this sector. This negative income effect can by the same reasoning also have occurred in the private rental sector. As a declining supply and lower relative rental prices result in less opportunities and could make a higher income lead to a lower

tendency to move. But there are a lot of nuances to be made on this reasoning as for instance the quality of the rental stock, or the amount of high income groups that live in cheap private rental homes have to be taken into account as well. Therefore it is expected that this variable has a more clear effect in the sales market as will be investigated in the next section.

Lagging variables

One always has to be careful when it comes to causality when interpreting regression results. One helpful method that was suggested by Granger (1969) to the question of whether x causes y is to see how much of the current y can be explained by past values of x and whether adding lagged values of x can improve the explanation. When older variables of X hold information that is not found in other variables and thereby helps to predict later values of Y, we say granger causality is present and this motivates further empirical testing. It is important to note that Granger causality does not imply that Y is the effect or the result of X as Granger causality does not by itself indicate causality in the more common use of the term.

Because the effects on turnover rates are mainly short term only one year lags are included in the current setting. In figure 25 the results show no important changes to variables and an increase of the r-squared. This 'Granger causal' result thus indicates a possible causal effect but as it does not capture all aspects of causality would need further testing.

To find out whether the correlation between the rental markets and turnover rates has diminished as I suggested to have happened because of policy changes I have done two separate regressions on the data as well. The first one is on the first years of the data 1998 – 2002 and second on the latter years 2003-2007. The results are shown in figure 26. The Wald tests show the result for the hypothesis that the variables for the second time period are equal to those in the first.

The striking result here is that the effect sizes of the rental markets have indeed diminished significantly. The relation between these rental markets and turnover rates is significantly smaller in the second period. Therefore the results are as expected and the pressure on housing market dynamics seems to be related to the pressure that has been put by policies on these market segments.

Next to this the correlations of new built housing in both periods and the size of the stock compared to the total population in the second period are significant at the 5%-level. The second variable though is not different from the first period so no significant development can be seen. The positive correlation of new homes is significantly lower than in the first part of the data. This can have different causes like for instance related to the size of building projects compared to the present stock. Unfortunately further analyses would be needed to search for the actual causes as no explanations based on these research findings can be given.

The fraction of small housing is not correlated with higher turnover rates in both periods, and in the first one only at the 10% significance level. Finally as before again no significant correlation between the age group and turnover rates can be found. This finding could seem to contradict the conclusion that mainly student-cities are represented in the lists with cities with the highest turnover rates, but this does not have to be the case. First of all a change in the fraction of the age-group might not influence the dynamics on city-level even though a city with a large fraction of young citizens is more dynamic. A more important factor for student-cities that house this group could be the ability to provide sufficient housing. A growth of small housing is then much more relevant than a growth of this age-group in itself, especially considering the lack of sufficient housing for this group. Evidence for this view is found in a separate regression for these student-cities (Leiden, Rotterdam, Delft, Amsterdam, Enschede, Maastricht, Eindhoven, Utrecht, Nijmegen, Wageningen, Tilburg and Groningen) and the fact that leaving out this group for the separate periods does not change the overall outcomes.
Another practical problem could be that the variations in the age-group within cities over the years might be too small and make it therefore less able to detect an influence on differences in turnover rates. Investigation of the data though shows that these are relatively substantial.

Fig 26: Separate regressions on two time periods (Cross section and Time period Fixed)

MODEL	1998-2002	2003-2007	Wald (equal)	Student Cities *Excluded* 1998 -2002	Wald (equal)	*Only* 1998-2007
(Constant)	-0,087 (0.049)**	0,052 (0.188)		-0,112 (0.010)**		-0,361 (0.013)**
Population 20to30	-0,121 (0.515)	0,142 (0.420)	2,236 (0.135)	0,009 (0.961)	0,493 (0.483)	0,019 (0.956)
Less than 3 rooms / Housing	0,175 (0.060)*	0,116 (0.289)	0,298 (0.585)	0,254 (0.005)**	0,768 (0.381)	0,677 (0.045)**
Housing stock / Population	0,054 (0.143)	0,050 (0.000)**	0,116 (0.734)	0,054 (0.137)	0,000 (0.996)	0,062 (0.726)
New Build in year / Housing stock	1,466 (0.000)**	1,067 (0.000)**	21,786 (0.000)**	1,477 (0.000)**	0,017 (0.898)	1,079 (0.000)**
Social Rent / Housing stock	0,523 (0.000)**	0,137 (0.040)**	33,213 (0.000)**	0,509 (0.000)**	0,054 (0.816)	0,575 (0.023)**
Private Rent / Housing stock	0,507 (0.000)**	0,157 (0.024)**	25,551 (0.000)**	0,496 (0.000)**	0,016 (0.899)	0,502 (0.087)*
R-squared	0,942	0,940		0,929		0,918
Likelihood ratio	18,850 (0.000)**	18,683 (0.000)**		18,388 (0.000)**		17,662 (0.000)**
Observations	1.545	1.545		1485		120

5.4 Dynamics in terms of transactions

Separating the transactions gives better insight in the specific characteristics of the sales market and the effects of the other markets on this one specifically. It is clear that housing market transactions is largely related to the economic developments. Although not very well visible in the investigated period (figure 15), the amount of transactions is quite volatile. The current economic downturn has led to an impressive decline of 32% in 2009 compared to 2008 (woningmarktcijfers). One identifiable cause is price declines/uncertainty which negatively influence the willingness to sell or buy. Transactions are thus also strongly related to asset price developments (Fisher et al. 2004). The use of time period fixed effects therefore seems to be appropriate here to catch the economic shocks that influence variables on a yearly basis.

Transaction intensity might also differ because of local market differences like population characteristics or the built stock as was seen before. Identifying and evaluating the relative effects of the variables is important to determine whether the presence of strong social and private rental markets also influence the dynamics in the sales market.
The dependent variable chosen here is the fraction of transactions to the total population size. This choice has been mostly practical as it can be better explained with the given data. The other option would be the amount of transactions as a fraction of the housing stock which is a better variable in terms of equality in the unit of measure. The correlation between these two measures is high 0,784 (0.000) and this choice will according to me not affect the reliability of the results.

The approach used for the transactions is similar to the turnover rates. And also the problems faced are similar. Therefore in this part only the final results of the cross-section fixed effect regressions will be given and interpreted.

Fig 27: Models and results for transactions (cross section and time period fixed effects)

	1998 -2007				
MODEL	1	2	1998-2002	2003-2007	Wald (equal)
(Constant)	-0,003 (0.160)	-0,009 (0.005)**	-0,010 (0.084)*	-0,005 (0.309)	
Population 20to30	-0,023 (0.041)**	-0,010 (0.386)	-0,020 (0.297)	-0,039 (0.030)**	1,108 (0.293)
Less than 3 rooms / Housing	0,025 (0.002)**	0,022 (0.007)**	0,022 (0.075)*	0,015 (0.127)	0,472 (0.492)
Housing stock / Population	0,028 (0.000)**	0,028 (0.000)**	0,030 (0.000)**	0,024 (0.000)**	69,617 (0.000)**
New Build in year / Housing stock	0,066 (0.000)**	0,064 (0.000)**	0,070 (0.000)**	0,043 (0.000)**	19,253 (0.000)**
Social Rent / Housing stock		0,017 (0.000)**	0,024 (0.012)**	0,022 (0.012)**	0,068 (0.795)
Private Rent / Housing stock		0,009 (0.072)*	0,018 (0.108)	0,018 (0.036)**	0,000 (0.976)
Income	0,000 (0.798)	0,000 (0.805)	0,000 (0.301)	0,000 (0.880)	
R-squared	0,833	0,836	0,864	0,884	
Likelihood ratio	17,065 (0.000)**	17,528 (0.000)**	10,272 (0.000)**	12,543 (0.000)**	
Observations	3090	3090	1.545	1.545	

As can be seen from the above figure the power of the model is lower than for the mutation rates. Therefore I expect other variables to be important for the sales market as well but I expect this not to influence the results much.

This age-group indeed seems to be unimportant in the sales sector and I expect them to be mainly active on the rental markets. This I conclude because a larger fraction of this age group on total population is not correlated with a higher transaction rate. For the separate period regressions in the last period the variable even has a significant negative sign at the 5%-level, this is in line with the sounds that this group is experiencing more problems in buying their first home. It would also be interesting to investigate the correlation between the fraction of this age group and dynamics on the rental market only, although no sufficient data was found here it could be done in future research.

A larger fraction of small houses seems to be positively correlated with the amount of transactions in the total data-set. Therefore it seems that small houses are transacted

more often and thus encourage dynamics. On the longer term the effect could be diminishing. As prices in this segment have been under pressure for a while and increase faster than in other segments (Sas and Voogt, 2004). But as the wald-test shows this conclusion cannot be made based on these results as the variable is not significantly different in the second period even though it is only significant in the first at the 10%-level.

The income variable is unimportant in this setting as well and adds no explanatory value to the model. The suggestion that people who earn relatively more are more inclined to move within their city could of course still hold as this data is on city-level. But a higher income within a city does not necessarily lead to more dynamics as it will depend on other factors as well. As explained before the development of house prices is for instance important as well but no accurate data is available for the investigated period.

Both the social (at the 5-% significance level) and the private rental sector (at the 10-% significance level) are positively correlated with a larger amount of transactions seen over the whole period. Over the separate periods this effect can be found at the 5%-level for all except the private sector between 1998 and 2002. This effect has not changed according to the Wald-test.
This finding sounds logical when one expects more dynamical rental markets also to create more opportunities in the sales market. Take for instance the example of older people in the later stages of their life who would often like to rent, to be able to use up the savings made on their homes. In case these people move, more opportunities are created for others to enter or move on the sales market as well. In the future a diminishing effect could be expected in case rental markets become more "stucked" themselves but this effect on the sales market cannot be detected yet.

6 Conclusions and Recommendations

The main conclusion of this research is that governmental intervention does not necessarily improve matters even though they are often done with the best intentions. As in this case the reason why the Dutch government appeals to demand side support is of course not to reduce housing opportunities for low-income families but actually to create these. Unfortunately these actions create disturbances in the "natural" processes and have led to a sub-optimal equilibrium with high house prices in the sales market and excess demand in the rental markets. This creates a form of "stuckness" in residential mobility as those who occupy relatively cheap rental dwellings are less inclined to move. This is especially true for the social rental market where the stock is often of good quality and the rental levels are far beneath the market prices for similar housing. But also in the private rental sector a similar process can be expected in case the discrepancy of user costs of different tenure types widens.
The originally more dynamic rental markets are found to be less strongly correlated with turnover rates which underpins this story and gives reasons to worry about future developments. Broadening the perspective and taking into concern the financial crisis, residential mobility is expected to dampen further in the near future because of a negative effect on the willingness of mainly owner-occupiers to move because of uncertainty about price developments. Next to this also the financial situation of social housing corporations is on decline and will affect their future building ambitions and thereby mobility is we have seen in the analysis.

Mobility on the other hand is very important in the dynamic economy in which we find ourselves nowadays. Dynamical job and housing markets have important supportive functions in such an economy and are essential for future growth development.
Based on these research results I expect that further postponing will only worsen the state and as seen in the analyses dampen both the sizes of and mobility in the rental sectors further. It is therefore necessary to take action on a short term to bend the declining mobility rates around.
From an economic perspective the best way to start is by restoring the functioning of the rental market; enabling investors to make a reasonable profit will restore equilibrium in this market by a growing supply of rental housing. Had it not been that due to other

regulations supply is not very responsive to price-increases; it could in the current situation also lead to undesirable high rental prices. On the longer term though these measures seem necessary but as Boelhouwer (2006) already suggested could better be done when the friction between total supply and demand in the market is less severe. Or of course when supply restrictions are dealt with as well, enabling supply to follow prices. Renters could in such a scenario be supported in a more efficient way by giving them a lump-sum tax. Thereby they will not be hurt financially and will as competition in the rental market re-emerges benefit from a better quality of supply. Although less in depth analysed in this research but given the complex context thus also important, policy changes in the sales sector should be considered. First of all as seen in section 3.3, probably the most important housing market-distorter is the restrictive spatial planning which has a negative effect on the supply of housing and should be adapted in order to restore equilibrium within the markets. Next to that also the abolishment of the transfer tax is a good start to encourage mobility and will have a positive effect on the dynamics in the owner-occupier sector.

A final remark that I want to make is that the way in which the Dutch housing market functions should not only be seen as negative. As for instance the social rental market has due to allowing middle and high-income groups contributed to less excessive income segregation, as would otherwise have occurred (Dieleman, 1994). Therefore when making the suggested adjustments these effects have to be considered as well. Preventing segregation with related problems like the concentration of disadvantaged has been an important issue in Dutch housing policy and should according to me be so as well. But there are different ways in order to deal with this problem and it does not seem fair to allow some of the middle and high-income families to live in social housing while others are not.

Further research and political vision is needed to see what the effect of changing policies will have on segregation and how it should be dealt with. But for me it stands that there is a large difference between the role of the social rental sector, aimed at providing housing for those who are unable to by themselves, and the private rental sector. And the way they can help restoring dynamics and preventing segregation. Baring in mind these issues I suggest it is time for the Dutch government to put its' shoulder to the wheel and start making the necessary changes.

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