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Housing Investments and Economic Growth

ABSTRACT

This paper examines the relationship between housing investments and economic growth. Through a literature review five different hypotheses are analysed to examine the effects of housing investments on economic growth. The studied effects include; direct effects, counter-cyclical effects, price effects and productivity effects through reduced mismatch between housing and labour markets, and finally effects on the productivity of workers. The conclusion is that the direct effects are only short term and the existence of counter-cyclical effects is doubtful. For the price effects and the effects on productivity there are less empirical evidence, but the effects are still considered significant.

Keywords: housing investments, new construction, economic growth, effects

LIST OF CONTENTS

1. Introduction.....	4
1.1 Theoretical framework.....	5
2. Direct effects on growth.....	8
2.1 Building investments and growth	8
2.1.1 Methodological differences.....	8
2.1.2 Results.....	9
3. Counter-cyclical effects	12
3.1 The Business cycle.....	12
3.2 Stability	12
4. Price effects.....	13
4.1 Model for the real estate market	14
4.2 Housing wealth	16
4.3 Wealth effects	16
5. Reduced mismatch	17
5.1 Three-sector model	18
5.2 Affordability.....	21
5.3 Unemployment.....	22
6. Productivity effects	23
7. Conclusions.....	25
8. References.....	27

1. Introduction

Public expenditure to increase housing investments is not only used to achieve the objectives of housing policies. To a large extent public expenditure to increase housing investments is used as a political tool with intended effects on other areas of the economy than the housing market. Increased housing investments could be seen as for example; a way to increase employment in the construction sector, a mean to reduce segregation or a way to draw more students to a university region, all of which in turn are assumed to have an impact on the economic development in the country. Since housing investments are used as a political tool to achieve objectives in many areas it is of great interest to study the actual effect that housing investments have on the economic development.

The aim of this paper is to analyse the relationship between housing investments and economic growth. In previous research this has mainly been done by studying one effect that housing investments have on economic growth at the time and focus has primarily been on demand effects. In this paper I intend to take on a broader perspective to be able to include the complexity of the relationship between economic growth and housing investments, by summarizing and bringing together different aspects of previous research. There is not one existing theory, which on its own is complex enough to take the broader perspective of the relationship into account. Therefore I have outlined a theoretical framework from which I have developed five hypotheses. These will be tested in a qualitative analysis based on a selective survey of previous research to be able to examine the different effects.

The structure of the paper is as follows; first the relationship between housing investments and growth are outlined in a theoretical framework, out of which five hypotheses are developed. In the second section empirical data on housing investments is presented. In the following chapters the five hypotheses are presented and analysed based on a review of previous research. Finally, in the last chapter I will attempt to draw conclusions and briefly discuss them in a wider political context.

1.1 Theoretical framework

As a background to my hypotheses, I have outlined a theoretical framework based on general housing market theory. The overall background is that housing investments can be initiated by either public or private sources. For private investors to be interested the housing investments have to be profitable and the investments are a function of the aggregated demand. Consequently, there are two ways to indirectly promote an increase of housing investments; either to directly increase the demand or to improve the profitability of the investments. Even though housing investments may be financed or initiated by different sources, the outcome in terms of price and other effects on the macroeconomy is to a large extent defined by the market. This means that when housing investments are used as a policy tool the outcome may not always be in line with the intended effects.

The framework will illustrate the assumed relationship between increased housing investments and economic growth through a simplification of the theoretical reasons behind the investments. Two main views are described; first, based on Keynesian theory governments may see changes in employment or aggregated demand as important tools to move the economy towards a general equilibrium level. If housing investments can change employment levels or the aggregated demand it can be used as a policy tool to improve growth. Secondly, governments can also use neoclassical growth theory, which emphasises the importance of investments and saving for economic growth, to justify public expenditure on housing investments. In accordance with this argument, housing investments can be justified if they can improve the productivity of the economy. To illustrate the effects of increased housing investments on a free market I start with discussing new construction in a simple model of the housing market. In the model it is assumed that both demand and supply on the market are rather elastic.

Figure 1a. Housing market in equilibrium.

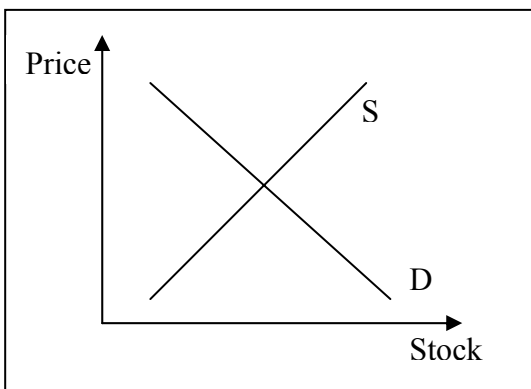


Figure 1b. Increased demand, new equilibrium.

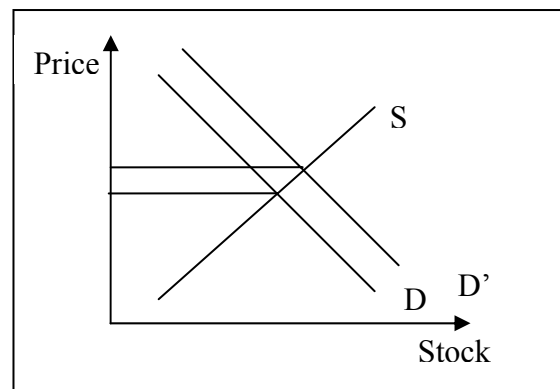


Figure 1a shows the market in equilibrium. In figure 1b housing investments arise as a function of increased demand. The increase in demand, seen as a shift of the demand curve from D to D', can be a result of for example a reduction of interest rates. The primary effect of the shift is increased prices. The increase in prices will increase the profitability for investors and, hence, the investment level. If no technological progress occurs in the construction sector an increase in investments must be followed by an *increase in employment* in the sector. As the employment in the sector increases, it can be assumed that this has *effects on the aggregated demand* on other parts of the economy. Consequently, in accordance with Keynesian arguments an increase in the demand for housing investments can be used to induce economic growth through effects on employment and the aggregated demand. By increasing employment and demand in times of recession housing investments can also be assumed to have *counter-cyclical effects* and thus, be used as a counter-cyclical policy tool.

However, as a function of the possibility of increased profitability more investors will be attracted to the sector in the long run, causing the supply curve to shift. The shift of the supply curve results in lower prices and a larger stock. The lower prices reduce the households' expenditure for housing. For the same amount of income households can then spend more on other types of consumption goods. This implies a positive *price effect* on consumption, which would increase the aggregated demand. A possibility of a consumption effect as a consequence of changes in the aggregated demand could be used to justify housing investments as a policy for increasing economic growth. However, the fall in housing prices does not only apply to new construction, but also to the older stock. For house-owners this fall of prices causes a reduction of their housing wealth. If there is a wealth channel through which housing wealth affects consumption, price effects of housing investments on consumption can be negative.

The positive effects described above have often been used as an argument to call for state interventions in the housing market. However, the view that public induced demand expansion can create permanent new jobs and economic growth is very much criticized. The argument standing against the view is that public expenditure can only induce growth if it raises the productivity potential of the economy (Meen, 1995). Increasingly often productivity effects and the relation to growth in the long run are used as an argument for state interventions and policies to increase housing investments. Especially, two areas seem to be most interesting for the relationship between housing markets and productivity. First; the mismatch between housing and

labour markets may hinder economic growth and, second, housing is an important factor for the improvement of workers productivity.

If a market in equilibrium faces an increased demand for a region's produced output the demand for labour will increase. If there are no employees with the right qualifications in the region, the need for migration to the region will increase. This will increase the demand for housing. If the supply of housing is inelastic, and can not house the migrants there is a risk that the migration will not occur, which will lead to a mismatch between the two markets. Thus, the region's output cannot increase as much as would be possible with a greater labour force. An increase in housing investments would reduce the mismatch and thereby the output can increase, and the economy can grow more. Housing investments can also be assumed to affect the production factors by improving housing conditions, which in turn have effects on human capital. By improving human capital housing investments can increase the productivity of the economy.

From the framework outlined above I have developed five hypotheses about the relationship between housing investments and growth to be analysed in the paper.

Hypotheses:

- Housing investments have a direct effect on economic growth through employment effects.
- Housing investments have a counter-cyclical effect on economic growth.
- Housing investments affect economic growth by influencing housing prices and thus households' consumption.
- Housing investments affect economic growth by reducing the mismatch between housing and labour markets.
- Housing investments increase the productivity of the workers in the economy and thereby affect economic growth.

2. Direct effects on growth

The direct effects that housing investments might have on growth have traditionally been seen as the most important contribution of housing investments, and therefore there is a number of studies that have investigated the effects. Since relatively new research approaches to growth have identified investments as a long-run determinant of growth different types of empirical research have emerged (Coakley and Wood, 1999). The analysis in this chapter is based on one of the types of empirical research that examines the relevance of different types of investment for economic growth. The first hypothesis is that *housing investments will have a direct effect on economic growth through employment effects*. Since new construction is labour intensive it creates employment opportunities, increases aggregated demand and hence induces economic growth.

2.1 Building investments and growth

It is reasonable to assume that the effects of building investments on growth to a large extent will hold for housing investments as well. If there are effects on employment and growth they will be similar, but for housing investments it is reasonable to assume that there will be other effects as well, which will be discussed later on in this paper. In studies concerning the relationship between building investments and economic growth, there seem to be contradictory findings about the effects. Some researchers consider building investments a major determinant of economic growth whereas others come to opposite conclusions. Among studies of housing, or building investments and growth three studies seem to be most discussed, even though only one of the three is especially concerned with building investments; DeLong and Summers (1991), Ball and Wood (1996) and Coakley and Wood (1999). These three studies are discussed in more detail here than the other studies.

2.1.1 Methodological differences

Ball and Wood (1999) claim that there is no well specified model for housing investment and economic development that can be used empirically in a comparative study. According to the authors this is due to the wide variation of social and economic histories in a country that affect today's housing situation and that are impossible to take into account in a single model. Still several researchers have made an attempt to model the impact of housing or building investments on economic growth. As a basis for the analysis some kind of a neo-classical model is often used, even though the model has been the objective of much criticism. In spite of the criticism, the neo-classical approach can be appropriate for many studies, but it should not be used without handling the results with caution (Meen, 2003).

The methodological differences between the three different papers mentioned above are relevant for the different results they obtain. DeLong and Summers (1991) use cross-section regressions with the annual growth rate of output per worker as the dependant variable and average investment (non-equipment and equipment) shares of GDP and the annual labour force growth rate as independent variables. The methods of DeLong and Summers are criticized by Ball and Wood (1996), as well as by Coakley and Wood (1999). They are mainly criticized for using cross-section data when studying economic growth, which according to the critics is a time series issue. Also the fact that they are using too short time cycles (25 years) are the object of criticism from the other authors, arguing that this is not a sufficient time period for building cycles. Ball and Wood (1996) take on another methodological approach in their study, using time series data to examine cointegration and causality. They use a long-term perspective (140 years) of Britain as a case study, testing the variables suggested by DeLong and Summers¹. They argue that a long-term perspective is needed in the empirical analysis. If a shorter period is used there is a higher risk that the whole adjustment process towards equilibrium is not included.. Coakley and Wood (1999) use a time series technique and the long run time perspective limits their data sets to six countries² with time series running from the late 19th century to 1992.

2.1.2 Results

No consensus on the relationship between building investments and growth and the effects of the relationship has been reached, illustrating the complexity of the issue. However, most results are somewhat in accord, apart from the results obtained by DeLong and Summers that are the most controversial. They claim that the relation between growth and investment in equipment and machinery is much stronger than the associations between growth and other types of investments (DeLong and Summers, 1991). This is questioned by Ball and Wood (1996) who found evidence for a relationship between growth and investments in both equipment and structures. The unique relationship between equipment investments and growth found by DeLong and Summers is also criticised by Coakley and Wood (1999). In their study they found a relationship between growth (GDP per worker) and investment both in equipment and non-residential buildings (Coakley and Wood, 1999). The existence of a relation between building investments and GDP is further supported by other researchers. In a study by Davis and Heathcote (2001) they conclude that there is a relationship between residential investments, non-residential investments, consumption and GDP. Fisher (1997), quoted in Leung (2004), also supports the existence of a relationship.

¹ Suggested variables, according to Ball and Wood, 1996, p 104; economy wide labour productivity, investment: equipment, structures, dwellings and other built structures and a series of price variables

² Included countries are: Us, Canada, Japan, UK, Finland and Germany.

He claims that the relationship can be explained by assuming that different kinds of capital are complementary in goods production (Leung, 2004). Taken together all the studies apart from DeLong and Summers shows a significant relationship between building or housing investments and growth. But even though there is a relationship, these studies do not examine how the relationship influences the economy.

Meen et al (2001)³ examine the direct effect of building investments on consumption and GDP, by estimating the economic effects of reducing new housing construction over a ten years period. Their results indicate that after an initial reduction the effects on GDP and consumption would be modest. In the long run employment in the construction sector might be reduced, but other sectors will expand, and, hence, would need more labour. In his earlier work from 1995 Meen looks at effects on GDP from an increase in housing investments by studying an annual increase in public expenditure on housing. Again he claims that the effects on the economy as a whole will be modest if a long time perspective is taken into account. The effect will not be permanent and will have disappeared after four years. In another study, also conducted by Meen (1992) and quoted in Clapham (1996), the employment effects are studied during a shorter time period. Meen includes both construction employment and increases in total employment, as a result of increased demand from the workers who would increase their consumption, in his analysis. Not surprisingly, the findings show that there is a clear employment effect both in the construction sector and in the total economy. According to Clapham these results are similar to findings of other studies.

Studies like Meen (1992) can be assumed to be very important for the arguments put forward for increased public expenditure to increase employment in the construction sector. But in his article from 1995 Meen does not only conclude that there are no effects in the long run, he also looks more in depth at the reason for this. He summarises his arguments into a list and below are three of his most notable points, which can be seen as a chain of reactions;

- The rise in demand will increase prices in the construction sector, and less output will be produced over time. In addition prices will also increase in other parts of the economy, leading to a reduction in demand. This could imply a higher employment in the construction sector, but lower employment elsewhere in the economy.
- If the increase comes from an increase in public expenditure this may cause a reaction in financial markets, which may result in an increase in interest rates.

³ Quoted in Meen (2003)

- If private housing investments are sensitive to changes in the interest rates, the increase in public financed housing may occur at the expense of private financed investments.

Summary of Meen, 1995, page 410.

Even if a relationship between housing investments and growth exists the causality of the relationship is not clear. It is not certain that building investments independently induce growth. It is possible that growth enhances investments or that building investments are connected with growth just as a complement to other investments. DeLong and Summers found a causal relationship between equipment investment and growth, with the direction of causality running from equipment investment to growth. This would indicate that equipment investments create economic growth, but growth does not influence investments in equipment. This result is questioned primarily by Coakley and Wood (1999). They argue that the strong evidence of causality can be questioned mainly since it is based on cross sectional data, rather than time series. Moreover, in their own study they found that the causality runs in both directions between investment and growth. They also found that causality runs in both directions between different forms of investments. The results of Ball and Wood (1996) also contrast with those of DeLong and Summers since they found that all categories of investments had a two-way causality.

Whether the results indicate that housing investments actually have an effect on growth, or if the studies only can prove that there is a relationship is interesting. The findings of a two-way causality between investments and growth, as well as between different groups of investments could indicate that housing investments only increase as a function of increased growth or as a complementary effect to increases in other investments. If this is the case, the importance of housing investments as a mean for inducing growth can be questioned. Even though the results are not in accord the arguments put forward by Ball and Wood and Coakley and Wood respectively, claiming that there is a relationship between housing investments and growth seem accurate. The authors include the possibilities of accelerator effects and of a complementary effect. The complementary effect would indicate that all investments need to be complemented by building investments, and it is reasonable to assume that this would also include housing. This discussion supports the findings of a relationship between housing investments and growth. The results of studies of direct effects in terms of changes in employment question the long term relationship. According to the reviewed literature housing investments only give positive effects on employment for a very short period.

3. Counter-cyclical effects

The results of the previous chapter indicate that there were short term effects of housing investments on employment and demand. This, in turn could indicate possible counter-cyclical effects. By increasing public expenditure at a time of low demand, governments aim to create growth by increasing employment and, thus, GDP (Meen, 1995, Clapham, 1996). Hence, the assumption of counter-cyclical effects on economic growth is used as an argument to justify changes in public expenditure on housing. This chapter will examine the hypothesis that *housing investments have a counter- cyclical effect on economic growth*.

However, there are other mechanisms than the direct effects that can be important for the possibility of counter-cyclical effects of housing investments. Below I will focus on two mechanisms; the relationship between housing investment cycles and the business cycle, and the possibility of housing investments as a stabilising factor to the economy. There is a possibility that these mechanisms can either reinforce or bring down the counter-cyclical effects.

3.1 The Business cycle

To study housing investments counter-cyclical effects it seems logical to start by looking at the relationship between the business cycle and housing investment cycles. In a study by OECD (2004), they claim that historically house price cycles tend to lag business cycles peaks and troughs. But this does not seem to hold for residential investments cycles. The findings of the OECD –study show that, at least in the UK and the United States, residential investments actually seem to lead output, rather than lag the business cycle. The findings are according to Leung (2004) similar to results of other earlier studies. However, the findings are not in accord with the result of a study by Davis and Heathcote (2001), where they were not able to find that residential investments lead GDP, while non-residential investments have a lag.

If housing investments lead the business cycle, there is a chance that public expenditure that increases housing investments could speed up the business cycle and reduce a recession. However, that would also mean a reinforcement of peaks, which could indicate a risk for overinvestments, and thereby risk increasing instability in the economy.

3.2 Stability

Another important mechanism related to housing investments and counter-cyclical policies, is housing investments as a stabilising or destabilising factor to the economy. Housing is one of the

most volatile sectors of the economy and building investment cycles are irregular both in length and incidence (Ball et al, 1996). As a consequence of the volatility a stabilising effect on the economy can be questioned, and thus the counter-cyclical effects. If housing investments are destabilising there is a risk that increased housing investments in a time of recession would increase instability in the economy. Ball et al (1996) conclude that the building investment cycles can not be used as an instrument to create stability to advanced economies. Ball and Wood (1999) also examine this from a historical perspective. By using a historical perspective the authors can conclude that up until the 1950's housing investments could be considered a stabilising factor to the world economy, but since the 1960's it has rather been a destabilising factor. Clapham (1996) claims that the result of the new British housing policies, which have intended to increase the efficiency of the market, is instead that the housing system will reinforce peaks in economic cycles and troughs. The efficiency effect risks to be somewhat smaller than the costs of instability. If there are more opportunities, or choices, on the housing market this will make households less dependant on the house price cycle for their investment decisions and thus prevent them from speeding up the house price cycles (Clapham, 1996). The volatility of housing investments questions the counter-cyclical effects of housing investments, especially since there is a risk that the housing investments will reinforce peaks and troughs in economic cycles. The instability of the sector would make counter-cyclical effects uncertain. But increased housing investments could on the other hand increase the choices for households and hence reduce the risk of reinforcement.

4. Price effects

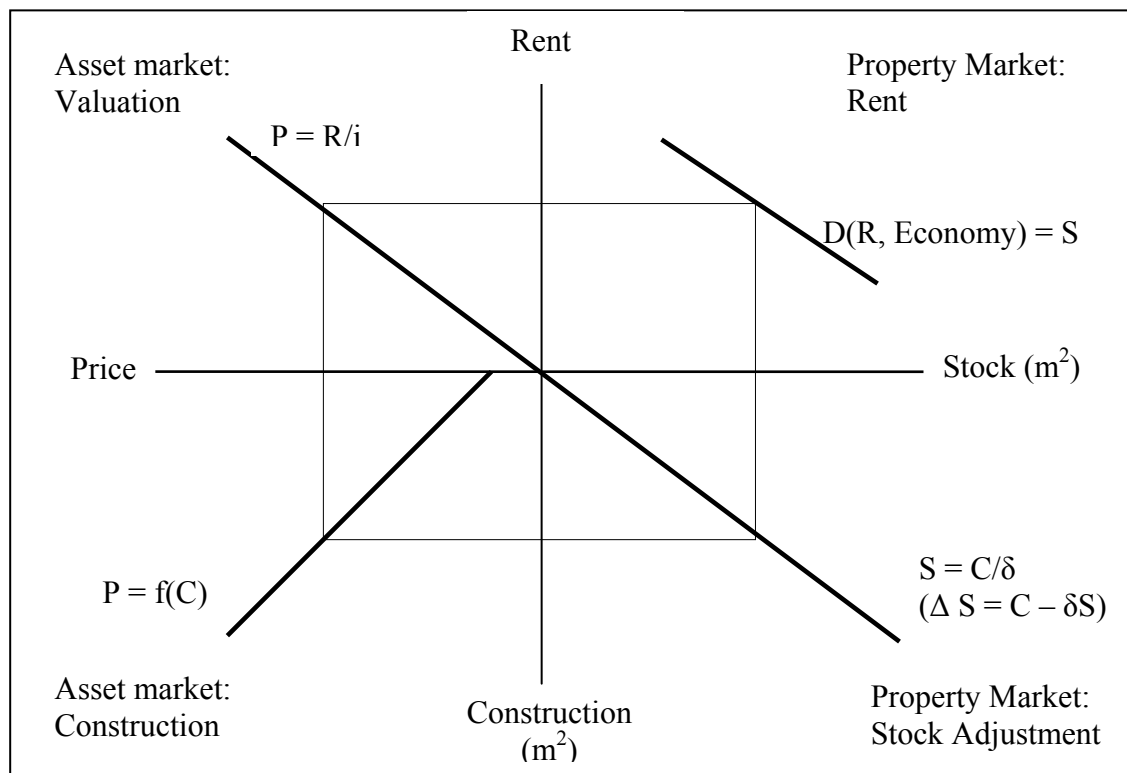
This hypothesis is based on four assumptions. The first assumption is derived from a simple model presented below. It is assumed that new construction affects the prices of the existing housing stock. The second assumption is that the price change will have implications for homeowners wealth and for the affordability of housing (Mayer and Sommerville, 2000). The third and perhaps most important assumption is that changes in households' wealth affect the households' consumption and, hence, the aggregated demand. Finally, it is assumed that changes in the economy's aggregated demand influence economic growth. The assumptions lead to my third hypothesis; *housing investments affect economic growth by influencing house prices, and thus household's consumption*. A price effect on consumption could either be positive, as a consequence of reduced costs for housing, or negative as a function of reduced housing wealth.

The first part of the chapter is a model of the real estate market that explains the relationship between housing investments, new construction, and house prices. This is followed by a brief description of the features of housing wealth in comparison to financial wealth. Then the possible effects of changed housing wealth on consumption are discussed.

4.1 Model for the real estate market

In a simple model for real estate assets and real estate use, the relationship between price and new construction is explained in a simplified way. The model divides the real estate market into two submarkets; property and asset markets. The market for real estate use, or space, referred to as the property market is where rents are determined depending on the demand for space. This should be distinguished from the asset market where prices and production are determined and where real estate is seen as a capital good. The model is based on DiPasquale and Wheaton, 1996, page 6-18. The quadrants are named from one to four in an anti-clockwise direction. Number two and three represent the asset market (ownership of real estate) and one and four are the property market (the use of space). The axes in the model represent: rent (per unit of space), price (per unit of space), construction (units of space, m^2) and stock (units of space, m^2).

Figure 5. The Real Estate market: the property and asset markets.



The rent quadrant shows how the demand for space is determined by the rent, given the state of the economy. Demand is a function of rent and general conditions in the economy and equals the stock in equilibrium. The gradient of the curve depends on the elasticity of demand; inelastic demand means a vertical curve, elastic demand a more horizontal curve. In the valuation quadrant the price for real estate assets is determined through the capitalization rate, represented by the middle ray, and the rent emerging from quadrant three. The price is given by following the rent from quadrant one, moving on to the capitalization ray and down to the price axis. In the construction quadrant the ray intersects with the price axis at the minimum value required for any new construction to take place. The curve $f(C)$ represents the cost of replacing real estate with new construction, and increases with the building activity. In equilibrium the construction is determined by the given asset price, and the building activity is then where replacement costs equal asset prices, $P = f(C)$. The last quadrant, stock adjustment, shows how the flow of new construction is converted into the real estate stock. Changes in the stock are caused by new construction or depreciation. A certain amount of annual new construction is required so that new construction will equal depreciation and the stock will be constant over time.

Through the model we can look at how exogenous changes affect the different parts of the market. We can start, as the model is described above, by looking at the rent quadrant and the effects of economic growth. Economic growth is shown in the model as a greater demand for space, which could be due to for example increases in production, household income or number of households. Economic growth is represented by an outward shift of the demand curve in quadrant one and the increase in demand will raise rents for a given amount of space. The increased rents will lead to higher asset prices, which in turn will lead to a higher level of new construction. The increase in new construction will generate a greater stock, as seen in quadrant four.

Shifts can also be caused by factors, which make investments in real estate less attractive to investors. Such factors can be; increases in interest rates, changes in how real estate capital is treated through the tax system or if the perceived risk of investing in real estate can increase the capitalization rate, i . In the model this is shown by a rotation of the ray in quadrant two, leading to lower asset prices. The last example of an exogenous change is shifts of the construction curve. A shift can be caused by for example scarcity of construction financing, higher short-term interest rates or changes in the building regulations or local planning restrictions. The mentioned

changes lead to reduced profitability of new construction which in turn leads to a negative shift (shifting to the left) of the supply curve.

4.2 Housing wealth

To be able to discuss whether housing investments has an effect on consumption through changes in housing wealth, it is important to discuss the features that distinguish housing wealth from other forms of wealth. These features may affect the existence of a housing wealth effect. Below is a summary of different areas described by Case et al (2001), who in turn follow the discussion of Shefrin and Thaler (1988). The areas mark a distinction between the impacts on consumption between different kinds of wealth;

- Increases in measured wealth of different kinds may be viewed by households as temporary or uncertain.
- Households may have a bequest motive which is strengthened by tax laws that favour holding appreciated assets until death.
- Households may view the accumulation of certain assets as an end in and of itself.
- Households may not find it easy to measure their wealth, and may not even know what it is from time to time.
- People may segregate different kind of wealth in to different 'mental accounts', which are then framed quite differently. The psychology of framing may dictate that certain assets are more appropriate to use for current expenditures while others are earmarked for long term savings.

Case et al (2001), page 173.

These features imply that changes in housing wealth are less likely to have an effect on consumption than changes of stock market wealth. Another argument against a housing wealth effect is that if housing wealth increases, it is as a consequence of increased house prices. An increase of house prices means that households that want to become house owners tomorrow must increase their savings today. Consequently they spend less money on consumption and more on savings. This indicates that the total wealth effect that housing wealth might have on consumption is uncertain.

4.3 Wealth effects

Unlike the theoretical reasons developed above would suggest, empirical studies have shown that changes in the market value of housing wealth have an impact on consumers' expenditure and on the activity in the economy in general. However, the results of different studies are not always in accord. Clapham (1996) presents results from different studies conducted in the UK, where the

consumer boom in the late 1980's is often said to be linked with increases in housing activity and house prices. He claims that the general increase of activity in the British economy coincided with increases in net mortgage lending and equity withdrawal as a percent of consumer spending. The OECD (2004) concluded that the marginal propensity to consume out of housing wealth varies between countries. For the US, Canada, the UK, the Netherlands and Australia a significant effect was found, whereas for France, Germany and Italy they found that changes in housing wealth had no significant effect on households' consumption. Case et al (2001) examined the effects on consumption related to housing wealth by estimating regressions based on cross-sectional time-series data (14 countries, 25 years). Compared to financial wealth the estimated housing wealth effects on consumption are significant and relatively large. However, the authors themselves stress that the results are not certain since they vary depending on econometric specifications.

In the model presented in the beginning of the chapter the primary effect of new construction is an increase of the stock, which will lead to lower prices. This means that households already owning a house will see the value of their house fall, and as a consequence their housing wealth will be reduced. According to the findings of previous studies some sort of wealth effect on consumption seems to exist, even though it varies between countries. In the case of housing investments the discussion concerns a negative wealth effect.

Still, for some households a positive price effect can be expected according to the model. If prices are reduced this means that housing expenditures fall. For tenants or new house-owners whose housing expenditures are reduced the housing investments are likely to reinforce a positive consumption effect, if they do not instead choose to increase their savings. The research on this subject is inconclusive, but some researchers claim that an increase in savings is more likely than an increase in consumption (OECD, 2004).

5. Reduced mismatch

The background to the hypothesis analysed in this chapter is the theoretical assumption that improved efficiency of the market increases productivity and induces economic growth. Generally it can be said that efficiency can be improved by reducing the existence of mismatch between demand and supply on any market. The argument about a mismatch between housing and labour markets as a hinder for economic growth is common in discussions about increased public expenditure on housing (Anderstig and Hårsman, 2004). A British study quoted in

Anderstig and Hårsman (2004) simulate economic development with a better match between housing demand and supply, claiming that a better match would have increased the GDP by between 0,4-1,8 per cent between 1994 and 2002. Even though the figures may vary, this indicates that by reducing the mismatch between housing and labour markets housing investments can affect economic growth. If there is a mismatch between housing and labour markets housing investments can be an important mean for reducing the mismatch. My fourth hypothesis follows this argument by claiming that *housing investments affect economic growth by reducing the mismatch between housing and labour markets*. The most important parts of the mismatch could, much simplified, be described in two points;

- The lack of affordable housing, which leads to shortage of workers in a certain region. Migration to the region is reduced due to an inadequate housing situation.
- The lack of mobility on a national level, which leads to regional unemployment in some regions at a time when there is shortage of workers in other regions. Since economic growth often has a regional dimension with regional differences in unemployment it is often argued that rigidity in the housing system leads to low levels of mobility and, hence, a mismatch between labour and housing markets. Rigidity of housing systems is in this case often seen as lack of choice of tenure. Housing investments are, thus, suppose to reduce the mismatch between labour and housing markets by increasing the existing housing options.

These two points will be examined in the analysis. First a three sector model that illustrates the relationship between output, housing and labour markets of economic growth is described. Then different aspects of a possible mismatch and the impacts of new construction are analysed.

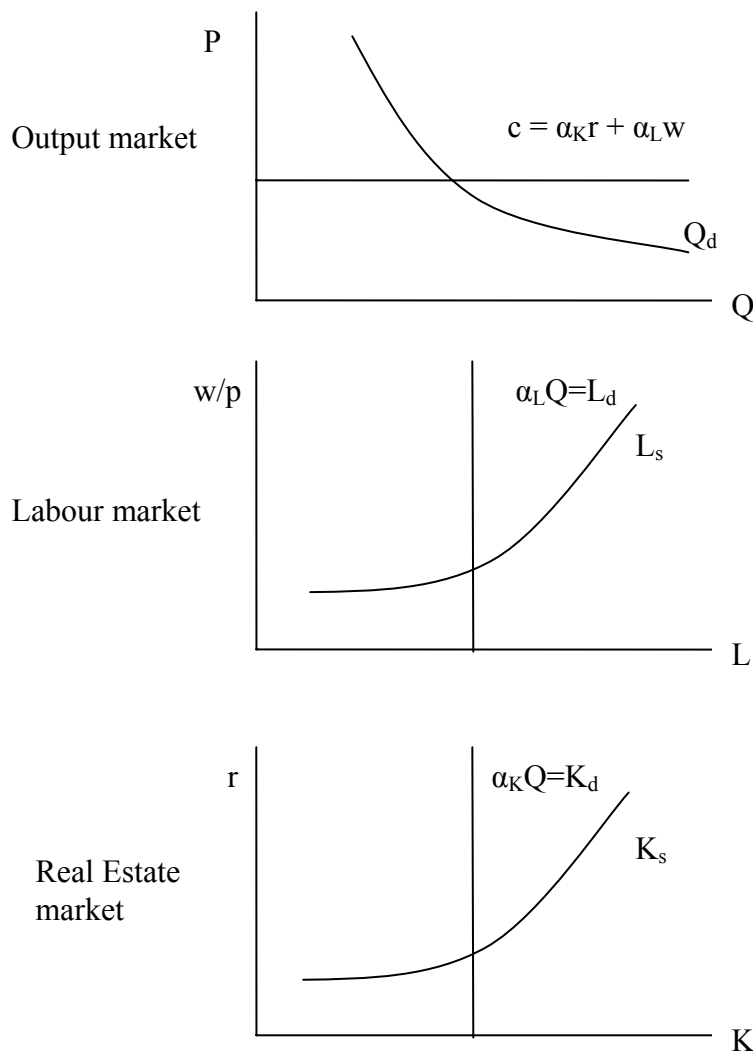
5.1 Three-sector model

To illustrate the effects of the mismatch and the relationship between housing and labour markets I have chosen a simple, static model developed by DiPasquale and Wheaton (1996, page 155-165). Anderstig and Hårsman (2004) used the same model in their study to discuss the importance of housing markets for economic growth. The model aims to give a complete picture of the local economy. The model illustrates the relationship between three regional markets:

- the output market (goods and services)
- the labour market
- the real estate market (including both housing and non-residential buildings)

The growth of the economy is driven by the export of output. Consequently, the output market in the model is primarily depending on exports of goods. In turn the demand for exports is a function of the relative price of output, which means that the demand for the regional output will be a negative function of the local production costs, as shown in figure 6. The production costs depend on a number of factors, for example the price of raw material. The raw material is, however, assumed to be imported and hence the prices tend to be similar across regions. This means that the price of raw material has little influence on the relative price of the output, whereas the primary factors of production; real estate and labour are considered local and therefore have an important impact on the relative production costs. It is assumed that for the production of one unit of output there is a fixed amount of real estate and labour required, and no substitution is possible between the two factors of production. The production cost per unit of output is $c = \alpha_K r + \alpha_L w$, where r is yearly rent and w is yearly wage.

Figure 6. Three –sector model of the regional economy.



In the labour market and the market for real estate, the demand is given by the vertical line indicating the level of production in the output market ($\alpha_L Q = L_d$, $\alpha_K Q = K_s$). Since no factor substitution is possible the demand is completely inelastic and shifts proportionately to the level of production in the region. In figure 6 the supply of labour is determined by the effective wage, which is the wage deflated by the price index or cost of living in the area (w/p). The supply schedule of real estate shows the rent necessary for the new construction needed to keep the stock demanded on the horizontal axis to take place. If the region should be able to expand, and therefore would need more real estate it is assumed that more land is needed, which demands higher rent to cover the costs of land development. The three markets are linked. As seen in the first of the three figures, the level of output is determined by the production costs, which in turn are set by wages and rents. The output level in turn determines the demand for the production factors and, given the supply schedules, this determines the price of the factors. For the regional economy to be in equilibrium the three markets need to be consistent.

Having explained the relation between the three markets I move on to discussing the relation between economic growth and the real estate market. Economic growth could be induced by for example an increased demand for the region's output. The increased demand would cause the demand curve, Q_d , to shift upwards. As a consequence of the increased demand, production and the costs of production will increase. The increase of the production cost is explained by looking at the increased demand in the output market that in turn increases the demand for the production factors. To attract new labour through migration the region's nominal wages must increase, so that the effective wage will increase. In the real estate market the increased demand of space causes rents to increase. This in turn demands an even higher nominal wage to cover for an overall higher price level in the region. This means that if the supply schedules are not very elastic prices in all three markets rise as a function of the increased demand. Even though there was an increased demand for the exports, since the costs increase some of the initial increase in demand will be reduced. The level of the reduction will depend on the relative changes, which in turn depends on the elasticity of the different factors of production and the demand of the produced output.

Anderstig and Hårsman (2004) claim that the model illustrates how an insufficient supply of housing can lead to rising rents. Thereby lack of housing investments can complicate migration needed for economic growth in a certain region. They continue by summarizing the most important implications of the model:

- In regions with a good economic growth it is assumed that the demand for labour can be provided by migration from other regions.
- Migration means an increased demand for housing.
- If the housing supply does not answer to the demand, a price adjustment will occur, leading to increased prices for housing and thus increased costs of living.
- An inelastic supply of housing, higher costs for housing and thus higher costs of living means that the migration is restrained and that the economic growth is slowed down.

Free translation of Anderstig and Hårsman, 2004, page 29.

5.2 Affordability

Affordable housing is important for the labour market in two ways: to keep employees and to contribute to facilitate migration of needed employees in to the region. Housing investments can increase the affordability by reducing house prices. Monk (2000) discusses linkages between the demand for labour in the local economy and the need for affordable housing. In many regional economies a shortage on the housing markets is reflecting on the labour market as problems to recruit persons with the right qualifications. The shortage causes problems for migration and thus, low mobility levels. The relationship between affordability, house prices and mobility has different impacts depending on the household's tenure situation. Households owning a home in regions that experience a recession are more likely to lose their job and at the same time they also face the risk of falling house prices. Consequently, people living in regions experiencing recessions might have a problem to sell their property, or risk selling it with a deficit. This results in high transaction costs for moving, which can have negative effects on the total levels of mobility on the economy (Green and Hendershott, 2001). For these households an increase of housing investments in the rental housing stock in another region may not have any effects on their situation. Even if the stock of rental housing is increased in regions with job opportunities, homeowners in regions experiencing a recession might be "locked-in" in their house with a negative equity. They face the choice of staying in their house and wait for a job opportunity in their region or move for a job, but then risk both losing money and higher living costs. If housing investments increase the rental stock in regions with job opportunities it seems more likely that renters or young adults still living at home would move since their transaction costs are low, whereas home owners are "locked-in" in their home region. If more people move from the region the house prices risk falling even more. The argument that the decision to move is related to the households housing situation is supported by the findings of Green and Hendershott (2001). They found that tenure was an important factor for labour decision for households where the cost of owning was relatively high compared to the cost of not finding a job immediately.

Since there are regional differences between house prices, even though households may not face a negative equity when moving, the price for a sold house in a region suffering from a recession is likely to be much lower than the price for a corresponding house in a region with a better labour market. Even though differences in salary may compensate for part of the differences, it is not likely to compensate for the whole differences in price. If the price setting is free on the housing market and all other variables are held constant housing investments will lead to lower house prices and thereby improve the possibilities for households to buy a home in a region where they are more likely to find a job. New construction changes the available stock on the housing market, and hence the price. This will increase affordability of housing and therefore reduce the mismatch between labour and housing markets. Many British studies have been carried out in the region of South East England where the ‘key workers’ are the fastest growing group of workers and where they have severe problems of accessing adequate housing (Monk, 2000). According to Monk these affordability issues have the potential of restraining continued economic growth, and this can only be prevented by increasing housing investments.

5.3 Unemployment

The second area of the mismatch described in the beginning of the chapter was unemployment resulting from insufficient levels of mobility. The primary reason for the expected relationship between low mobility and home ownership is the higher transaction costs that are associated with selling a home compared to moving from a rented dwelling. These higher transaction costs are assumed to decrease people’s incentives for moving, and hence renters are supposed to be more mobile than owners. According to Quigley (2003) the higher transaction costs for owners include higher search costs; since a home purchase is a big investment one can expect the time devoted to search for a home is greater, and therefore more expensive than for renters. Moreover, renters face lower costs for legal advice and administration. There is also a higher risk included with ownership and uncertainty or expectations can increase the transaction costs for owners.

Quigley (2003) goes through recent research of the relationship between tenure and unemployment, and states that “there is no credible evidence that the institution of homeownership ‘causes’ higher unemployment levels in the economy.” (Quigley, page 65). He further explains that evidence proving the relationship between high unemployment and a high level of ownership are mainly just based on simple cross-tabulations, which according to Quigley is not credible enough. One of the more notable studies of the relationship between tenure and unemployment is carried out by Green and Hendershott (2001). They found a significant relationship between tenure and unemployment for middle aged households. But for

both young and old households there was no significant result when testing for correlation between home-ownership and unemployment.

The results of Green and Hendershott could be related to the fact that the relationship between tenure and mobility depend on more complex factors than just the transaction costs. It is likely that other factors like demography or income also have an important influence on the choice of moving. Based on results from other researches, Clapham (1996) argues that the mobility of workers is more influenced by income, career choices and social status of the household than tenure. Clapham uses McGregor et al (1992), to argue that people with the same income level are just as likely to move independent of whether they are tenants or own their home (Clapham, 1996). This view is also supported by Hendershott and Green (2001), who criticize their own results by arguing that the household's choice of tenure is dependant of whether the household plans to be mobile in the future or not. Households that plan to move more often are less likely to buy their home than households planning to stay at one place. This makes homeownership as the most important feature of mobility doubtful. Housing is just one of many variables that affect mobility, and the correlation between housing and other socio economic factors must be taken into account.

Even if the relation between tenure, mobility and unemployment is complex the analysis above indicates that for the flexibility of the housing market, and thus a reduction of the mismatch a rental housing stock is important. This is also supported by Clapham (1996) claiming that an increase in the rental housing stock is the best way to improve the mobility levels.

6. Productivity effects

The hypothesis in this chapter is based on the argument that housing conditions affect the productivity of workers. Since housing investments can change the housing conditions, they can affect the productivity in the economy and, hence, have effects on growth; *housing investments increase the productivity of the workers in the economy and thereby affect economic growth.*

According to neo classical theory economic growth can be induced by increased productivity. This can be shown in a simplified production function (Blanchard, 2000).

$$Y = F(K, AN) \quad (1)$$

, where Y is aggregated output, K is the aggregate capital stock and, A is the units of output produced by each worker, and N is the aggregated employment, the number of workers. If, for simplicity, the effects of changed capital are ignored focus can be on what happens if the technological progress is improved. With an optimistic view of technological progress it means that the economy can produce more output with the same amount of workers. This is shown in equation 2 and 3.

$$Y = AN \quad (2)$$

If the number of workers is held constant and A is increased, output will increase as shown in equation 3;

$$A \uparrow \rightarrow AN \uparrow \rightarrow Y \uparrow \quad (3)$$

This means that if housing investments can increase the productivity of the workers, housing investments can affect economic growth through productivity effects.

The impacts of housing construction on technological progress and productivity have to a large extent been ignored in empirical analysis of housing and the macroeconomy (Meen, 2003). In general factors through which housing conditions can affect productivity of the labour force are mainly discussed by researchers from other disciplines than economics; still it is reasonable to assume that it has an important economical impact. Effects on health and other factors related to productivity of workers have been studied in relation to tenure, which tends to be studies very specific for the American housing market. However, even though not very many researchers have conducted empirical studies, several researchers have discussed the relation between housing investments and productivity.

Ball and Wood (1999) do not look at the productivity effects of increased housing investments, rather the opposite. In their discussion of housing investment levels, they claim that the observed reduction of investment levels risks weakening the effect on human capital, which they call “housing-induced improvements to human capital” (Ball and Wood, 1999). Clapham (1996) mentions several important relationships through which housing investments can influence the productivity of workers. Two of the most notable are the relationships between housing investments and health, and housing investments and educational achievements. Firstly, he argues that poor housing conditions lead to bad health. By increasing housing investments peoples health and thereby productivity would increase. The second relationship mentioned by Clapham is the one between educational achievements and the home environment. He argues that children living in over crowded houses or under poor housing conditions in general will not

have the same conditions for succeeding with their education as children living in a better environment. Increased housing investments would improve the chances of better housing conditions and hence increase the possibilities of educational achievements for children living under bad housing conditions.

As a consequence of the lack of research on the subject, this chapter has not got the same empirical basis as previous chapters. However, it is still important to include this effect and emphasise the economic importance of a field traditionally studied by other disciplines. Housing investments can be assumed to increase the housing conditions they can affect the productivity of the workers, and hence affect economic growth.

7. Conclusions

The analysis has shown that there is evidence for direct short term effects on employment and demand, but that these are not lasting. Hence, the first hypothesis can be rejected if the time perspective is long, otherwise not. The second hypothesis could be rejected, the counter-cyclical effects on growth are not significant. The analysis of the price effects of housing investments is inconclusive and there is no empirical evidence for the total effects. Still, previous research has shown a significant wealth effect on consumption from changes in housing wealth. If these results are applied on the case of housing investments, the consumption effects can be assumed to be negative, or at least not positive. But price changes can also have a direct positive effect on consumption. Thus, housing investments seem to have effects on consumption and thereby on economic growth, even though the extent of the effects is uncertain. This means that I do not have enough evidence for my third hypothesis to be rejected. For the two last hypotheses that concerned the productivity effects the analysis is less thorough, since less empirical research has been conducted. Nevertheless, the discussions and analysis in previous research indicate that there are significant productivity effects of increasing housing investments partly derived from reducing the mismatch between housing and labour markets, and partly by increasing the productivity of workers through effects on human capital. Therefore I see no reason to reject my last two hypotheses. If these conclusions are placed in a wider political context, they indicate that housing investments can be used as a long term policy tool to induce economic growth rather than a short term tool to reduce unemployment or speed up the business cycle, even though that is a very common justification of increased expenditure on housing investments.

The findings of previous studies as well as the theoretical assumptions imply that there is a long-run relationship between housing investments and growth. However, the causality of the long-

run relationship is not certain and the possibility of a two-way causality shows the difficulties of trying to separate the impact that different factors have on growth. If growth enhances building investments rather than the opposite this questions the importance of public expenditure on housing investments as a policy tool to induce growth.

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