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The house price development in Spain between 1997 and 2012

An empirical analysis of the main drivers and the role of the government

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Abstract

The aim of this thesis is to consider a broad range of factors, both market based and policy based, which have contributed to the dramatic rise and fall in house prices in Spain between 1997 and the second quarter of 2012. We combine existing theories on drivers of house prices and available data on these drivers in a qualitative analysis. Our findings are then related to several empirical studies conducted by others. Finally, by considering the drivers that are related to government policy, we analyze the influence of the government on the house price development.

Our findings suggest that the land on which the Spanish houses were built is the component that increased the most in value between 1997 and 2007. We also suggest that the low rental share in Spain might have contributed to the increase in house prices towards 2008. Important drivers of demand are income, unemployment rates, tax deductions for house purchase and credit growth. However, the most important driver, which explains both the surge in house prices as well as the decline after 2008, is the presence of irrational expectations.

Our findings suggest that inconsistent housing policies and a lack of supervision of credit institutions after the entry to the EMU have had a significant effect in the creation of the Spanish housing bubble. We therefore suggest that the government influence on the house price development between 1997 and 2012 has been substantial.

Preface

This thesis is written as a part of the Master of Science in Economics and Business Administration program at the Norwegian School of Economics (NHH). The thesis is written within the fields of Financial Economics and Business Analysis and Performance Management, and is produced during the fall 2012.

During our studies at NHH we have developed a genuine interest for Spain, through exchange programs to the country at both bachelor and master level. Moreover, our familiarity with the Spanish language and history has enabled us to find and understand relevant literature and data. The topic of the thesis is of particular interest with regard to the ongoing Euro Crisis, something that has made this investigation even more interesting. The process has truly been an inspiring and educational experience.

We direct sincere gratitude to our thesis advisor, Stig Tenold, for constructive advice and availability throughout this process.

Bergen, December 2012

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1 Introduction

The ongoing economic crisis in Spain has received a lot of attention throughout the world. Up until 2007 the country was considered a unique success story after having transferred from an authoritarian dictatorship lasting until 1975, to a democracy with institutional stability and economic growth. After entering the EMU the economic growth accelerated, turning Spain into one of the most important economies in Europe. An important turn of event occurred with the global financial crisis of 2008. Economic growth in Spain was replaced by recession as well as huge budget deficits and the highest unemployment rate in Europe. The economic crisis in Spain has been threefold; a financial crisis, a sovereign debt crisis and a crisis in the property market. The latter component has been described as one of the reasons that the severity and duration of the crisis in Spain has exceeded that of many other European countries, and it is closely related to the financial component of the crisis.

The Spanish housing market experienced a spectacular increase in the house prices from 1997 to 2008, and a subsequent fall in the prices from 2008 to 2012. This price fall had dramatic consequences for the Spanish economy. In Spain, there is a lot of speculation among the public about the effects of different government policies on the house price development, and many people blame some of the government policies introduced during the late 1990s. The aim of this thesis is to consider a broad range of factors, both market based and policy based, which have contributed to the dramatic development in house prices between 1997 and the second quarter of 2012. The difference in the nature of many of these factors impedes the possibility to do a strictly empirical analysis. We will therefore use existing theories on drivers of house prices and available data on these drivers in a qualitative analysis. Our findings are related to several empirical studies conducted by others on the Spanish case when analyzing our problem statement:

What are the main drivers of the rise and fall in house prices in Spain from 1997 to 2012, and to what extent have government policies influenced this development?

The qualitative research approach allows us to consider a broad range of drivers, however, it impedes the possibility to give a precise measurement of their relative importance on the house price development.

1.1 Methodology and data

Addressing our problem statement involves five steps. First, in chapter 2, an extensive presentation of theory is presented together with a framework provided by Poterba (1984). Different views on what affects house prices is considered in order have a complete overview of potential drivers of the house price development in Spain. In the second step, in chapters 3.1 and 3.2, we provide an introduction to the historical development in the Spanish economy including housing policies that are relevant for the development in house prices. This will give the reader an insight into the mentality of the Spaniards regarding housing, and give an overview of important changes in the economy. In the third step quantitative data on the drivers of house prices are presented based on the model of Poterba (1984). The model has been criticized for disregarding some drivers that might play a major role in the development of house prices. The criticism of the model is therefore used actively when we in the fourth step present additional data of drivers not mentioned in the model of Poterba (1984). All the quantitative data are presented in the chapters 3.3 to 3.5. In the final step, in chapter 4, we consider all the drivers separately and the importance of each driver is discussed: Using the qualitative data provided, and the framework of Poterba (1984) as a template we discuss the importance of each driver. Further we relate our own findings to other studies. A big part of the analysis therefore encompasses discussions of empirical analyses conducted by others. Finally we will consider the policy implications of our findings and discuss the role of the government in the house price development between 1997 and 2012.

The theoretical framework in this thesis considers the market for owner-occupied housing for the primary dwelling.[1] Unfortunately our data on house prices and new construction do not distinguish between primary dwellings and vacation houses. However, given the fact the primary dwellings represent the larger share of the housing stock, and that the growth in primary dwellings exceeded that of vacation houses, we found it reasonable to use the data that we have obtained, in lack of more specific data. The housing market is studied from the macro-perspective and regional differences will not be discussed in the analysis. All types of dwellings, such as apartments and different types of houses are considered homogenous

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[1] A house bought for one's own consumption which is considered the dwelling in which one or more people live most of the time.

regardless of their age, location or other characteristics defining their quality.

Most of the data have been obtained from the National Institute of Statistics (INE) in Spain and the Ministry of Infrastructure (Ministerio de Fomento). However, due to significant changes in methodology in 2000 it has been difficult to create coherent time series for the entire period. Some of the data were obtained only from 2004 onwards, when the Ministry of Infrastructure replaced the previous Ministry of Housing (Ministerio de Vivienda). New and more sophisticated methods for collecting and consolidating data were also introduced in 2004. Consequently, some of our data only exist from 2005 onwards.[2]

Primary data on some drivers, such as the price of land and the rental share were not available. In these cases, we have used graphs created by others without having obtained the data ourselves. When doing this we have made sure that the initial sources are credible.[3]

Studying house prices at an aggregate level has some limitations. First, considering the average square meter price of the entire housing stock disregards the heterogeneous nature of houses: Two identical houses can be considered different in quality based only on location. Characteristics such as the number of bathrooms and the size of the house are also important determinants of their price. Studying the average aggregate square meter price therefore disregards the continual change in the average quality of the housing stock, which likely has an important effect on house prices (Rappaport, 2007). A second measurement problem is caused by the infrequency of sales. Because transactions on any specific house occur relatively infrequently it is hard to know the amount at which a specific house will be transact today (Rappaport, 2007). We operate with the data on house prices provided by the National Institute of Statistics in Spain and assume that they are reliable.

Not discussing regional differences in the analysis also poses a significant limitation. Both demand and supply can vary significantly across regions and considering them at an aggregate level disregards these regional differences. When considering oversupply of houses in Spain, it might be the case that some, very popular regions, in fact have an undersupply, which is outweighed by the oversupply of housing in other regions. However, the house price

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[2] We have also extracted data from Banco de España, Banco Bilbao Vizcaya Argentaria BBVA (2012), Economic Database of the Spanish Public Sector (BADESPE), EU Inflation, Macro Indicators (Datos Macro), the Spanish Mortgage Association (AHE), Trading Economics and the Organization for Economic Cooperation and Development (OECD) and the World Bank.

[3] We have only used graphs made by others if the initial sources were one of the following institutions: the National Institute of Statistics (INE), Ministry of Infrastructure (Ministerio de Fomento) or Banco de España.

development has been fairly similar across all regions, and the extent to which prices have increased and then dropped between 1997 and 2012 suggest that the quality of the housing stock is not the most important driver.

Although a qualitative research approach has the advantage of a broad analysis, not limited by econometric specifications and assumptions, the method has some weaknesses. A qualitative research approach is based on subjective interpretations of the data obtained. In the analysis we relate our own findings to other studies. Consequently, the validity of our results depends on our ability to interpret the data and to choose other studies that are both relevant and important. The lack of data on certain drivers, leading to incomplete time series not covering the entire period, poses a significant limitation. In the analysis, when discussing the importance of drivers where we have incomplete data, we put more emphasis on the findings of others.

2 Real estate economics and the theoretical framework

Before examining the drivers of house prices in Spain, it is necessary to have an understanding of supply and demand for housing. In this chapter the theoretical framework to be used in the analysis is presented. First, an introduction to real estate economics is provided to give an understanding of the theoretical basis and the scope of the framework. Housing markets and house prices have been subject to a lot of discussion among academics the last 50 years. A presentation of related literature will therefore also be provided in order to get an overview of the research that has been done, and to give an idea of where the framework to be used might fall short.

2.1 An introduction to real estate economics

The focus in real estate economics is on developing an understanding of the factors that shape and influence markets for real property (DiPasquale and Wheaton, 1996). It is a field in which economics is applied to understand supply, demand and the price development of real estate.

DiPasquale and Wheaton (1996) point out the importance of distinguishing between the macroeconomic and the microeconomic perspective in real estate economics. The fact that the demand for two identical houses can differ due to factors such as attractiveness of the location is considered in the micro perspective. Thus, the micro perspective focuses on the structural and locational characteristics of the prices and rents for a particular property or development (DiPasquale and Wheaton, 1996). In this thesis, however, we will focus on the macro perspective and consider the overall market for housing in Spain. A house will therefore be considered a homogenous good, regardless of location as well as other characteristics affecting its quality. A real estate market can be defined as a group of properties that respond similarly with respect to macro factors (DiPasquale and Wheaton, 1996). This aggregation makes it easier to obtain detailed time series on important drivers such as GDP, unemployment and the interest rate.

Another important distinction within real estate economics is the one between residential and non-residential property. The market for residential property, from now on referred to as the housing market, encompasses dwellings such as houses, apartments and vacation houses. Non-residential property, also called commercial property, refers to property with other purposes than housing such as churches, hotels, shopping centers, and office buildings. See figure 1.

Figure 1: Submarkets within real estate economics

The market for land could also be considered a submarket within real estate economics. This market is related to both housing and commercial property, but also agricultural activity. At the macro-level the housing market and the market for commercial property do not relate closely neither in price development nor construction (DiPasquale and Wheaton, 1996). They also differ in terms of financing: Whereas mortgage financing is highly prevalent in the market for housing, commercial property is often financed through private placements. The institutions that guide these markets also behave differently with residential contractors on the one hand and industrial or commercial brokerage firms on the other (DiPasquale and Wheaton, 1996). Therefore it might be reasonable to look at these as two distinct markets.[4] In this thesis the focus is on the market for residential property - the housing market. Some attention will also be dedicated to the availability and price of land and its effect on the housing market.

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[4] One must take into account that commercial realestate can affect the attractiveness of being a tenant in the housing market. This are discussed further in shortcomings of the theory related to portfolio desicions of consumers.

2.2 Related literature

In recent years the housing market has proven to have an important influence on the general economy and house prices have been subject to a lot of attention both in the media and among economists. Nakajima (2011) proposed to divide the theories addressing house price developments into three groups based on supply, important drivers of demand such as demographics and income, and expectations respectively.

The first group of theories addresses the inflexible nature of housing supply. Construction is a time consuming process and depends on the availability of land. Eicher (2008) examines the effect of land use regulation on house prices between 1986 and 2006 in 250 major cities in the US. Using the Wharton Index[5] he finds that land use regulation is correlated with house prices and that this effect is, on average, larger than the effect of income and population growth. Kiyotaki, Michaelides and Nikolov (2008) examine the effect of limited supply of land on house price dynamics. They developed a life-cycle model of a production economy in which land and capital are used to build residential and commercial real estates. The model suggests that in economies where the value of land is high relative to the total value of real estate, house prices react more to exogenous changes in economic growth and the interest rate. Thus, previous literature indicates that the inflexibility of housing supply, caused by regulation of land, seems to have an effect on house prices.

The second group of theories examines why demand for housing has increased over time. Several studies on house prices have emphasized changes in demographics and movements in income as prime determinants of house price demand. In their 1989 paper, Mankiw and Weil argued that the demand for housing was particularly high when the baby boom generation was in its 30s and 40s. Their prediction was that the demand would decline in the subsequent two decades with the aging and retirement of this generation reducing the growth rate of the prime home-owning age group. In the absence of a decline in house prices the last three decades, Mankiw and Weil's (1989) prediction has proved to be inaccurate, but Martin (2005) made a

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[5] The Wharton Index is based on 70 land use indicators. This index addresses the three most important issues associated with land use regulations: Urban growth boundaries, regulation of development densities and cost increasing regulations (the average number of days to get permission for building).

new and improved model based on the same idea.[6] The results support the idea of Mankiw and Weil (1989) indicating that changes in the working age population driven by the baby boom is a likely driver of house prices. Many economists believe that house prices and household income are somehow correlated.[7] In a 2005 study, Makoto Nakajima argues that the increased demand for housing the last 40 years can partly be explained by the fact that individual wages have become more volatile since the 1970s. The study indicates that demand for housing increases with the volatility of income. The rationale is that it is natural for people to save more in precautionary investments, such as housing, and prepare for bad times when income is more volatile. To sum up, population and income growth might contribute to explaining some of the historic increase in house prices.

The third group of theories explaining the rise in house prices examines the effect of expectations. An important definition in this regard is that of fundamental drivers of house prices. These are factors that naturally should have an effect on house prices. García-Montalvo (2006) points out that fundamental drivers of demand can be demographics, interest rates, household income, developments in the labor market, credit conditions and tax benefits. Examples of fundamental drivers of supply can be land use regulation, construction costs and the price of land. House prices often vary more than its fundamentals[8] and it is therefore reasonable to assume that expectations can somehow contribute to shaping house price dynamics (Nakajima, 2011).

Robert Shiller (2007) argues that expectations alone can affect the price of assets: if everybody expects house prices to rise, the prices can go up only because more people choose to buy now hoping for capital gains in the future. This phenomenon is what is referred to as a speculative bubble defined as a "self-fulfilling surge in prices, significantly more than warranted by fundamentals" (Grytten, 2012). These bubbles may be followed by a rapid fall in prices as a massive sell-off occurs, but historically bubbles do not necessarily end up in crashes (Grytten, 2012). Piazzesi and Schneider (2009) studied the beliefs of US households

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[6] Martin (2005) argued that Mankiw and Weil neglected the effect of the discount rate on the house prices and the effect of the baby boomers on the dicount rate (other determinants of demand) by working in a partial equilibrium environment.

[7] See Gan and Hill (2008) and Gallin (2003).

[8] The definition of OECD (2005): "Econometric models can be used to compute the "fundamental" price, as determined by demand (derived on the basis of factors such as real disposable income, real interest rates and demographic developments) and supply (derived from factors influencing the available housing stock)."

during the recent housing boom. Using the Michigan Survey of Consumers they asked about people's expectations about current and future house prices. Their estimation indicates that there is always a small cluster of households believing that it is a good time to buy a house because they are expecting that prices will continue to rise further. They also estimated that the size of this cluster doubled towards the end of the housing boom, even though prices were rising to historical heights. Based on these results, Piazzesi and Schneider (2009) developed a theory in which people's expectations about house prices are driven by momentum: When prices are going up, these momentum households will help keep prices in the same upward direction, because based on their recent experience, they expect them to do so. Kahn (2008) presents a different explanation as to how expectations can affect house prices. He attributes the price fluctuation since the 1960s to economic factors arguing that productivity swings can determine the price of housing through income growth and long-term income expectations.[9] According to Kahn (2008) the resurgence in economic growth that began in the mid-1990s created a feeling of optimism about future income. Further he argues that it is likely that this encouraged households to pay high prices for housing. In 2007, however, this optimism faded due to evidence of a productivity slowdown crushing the expectations of future income growth, busting the housing bubble (Kahn, 2008). Based on existing research one can therefore assume that expectations somehow have an effect on house prices.

2.3 The model

The theoretical framework in this thesis is based on the model presented by Poterba (1984) and later modified by García-Montalvo (2003) with regard to Spanish tax legislation. It is a simplistic model used to understand house price dynamics using an asset market approach for owner-occupiers. Factors such as population growth and economic growth are considered constant. Changes in these variables will cause exogenous shifts in the supply and demand curve. The model also assumes that households have rational expectations and perfect foresight with regard to the future path of the economy.[10]

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[9] Specifically, swings in labor productivity, or output per hour of work affect house prices (Kahn, 2008).
[10] This assumption is questioned by Shiller (2007)

It can be somewhat difficult to determine who the consumer in the housing market is: Some people buy a house only for investment purposes putting it up for rent, others are both investors and consumers living in a house they bought themselves, and some are tenants. Before presenting the theoretical framework to be used in this thesis, we will make some clarifying and simplifying assumptions, inspired by DiPasquale and Wheaton (1996), as to what determines supply and demand as well as who are the participants in the housing market.

A home can be considered a durable good and its production and price can therefore be determined in an asset market, in which the number of people wanting to own a house should equal the number of houses available for owning.[11] The people wanting to invest in a house can be investors who want to put it up for rent (landlords) and leave the consumption of the house to someone else (tenants). Those who want to own their own place (owner-occupiers) are both consumers and investors. This is illustrated in figure 2. In this thesis we will only consider the market for owner-occupied houses.

Figure 2: The housing market
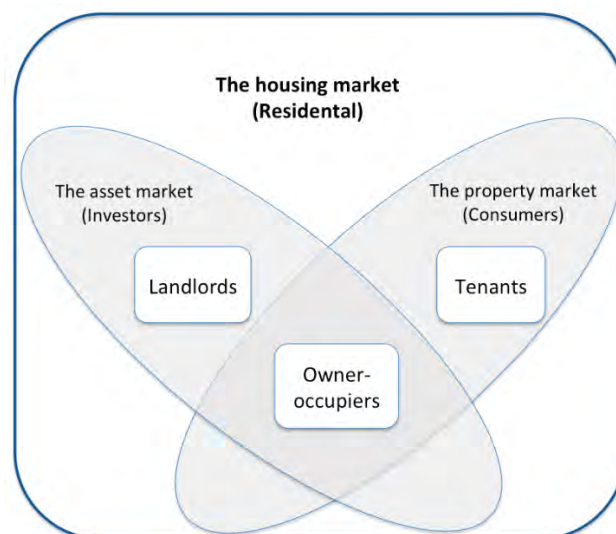
The supply of new houses is provided by the construction industry and depends on house prices relative to the replacement or construction costs. In the short run, the houses available for owning - the housing stock - is considered to be fixed because construction is a time consuming process. In the model, houses are assumed to be homogeneous, so the quality of new construction is considered to be the same as that of the existing stock (Poterba, 1984).

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[11] From now on when referring to real estate assets we only include residential property

The price is not the only factor affecting the demand for real estate assets: Another important factor is the rental income that real estate assets earn. Thus, to fully understand the demand side of the housing market one must also consider the market for real estate consumption, from now on referred to as the property market. As figure 2 illustrates, consumers in the property market include everyone who wants a place to stay and can be either tenants or owners of their own home. Their demand for housing depends on the income and cost of occupying that house relative to the cost of other commodities. For tenants, the rent is specified in the rental contract, but for homeowners, the rent is defined as the value of living in that house. More specifically, what they would have had to pay if they were tenants of the house and did not own it. The property market, thus, determines a rent-level at which the demand for housing consumption is equal to the supply of housing.

DiPasquale and Wheaton (1996) point out that the market for real estate assets and the property market, for consumption of real estate, are related: First, the rent level determined in the property market affects the demand for real estate assets. The rationale is that higher rents increase the value of owning and vice-versa. Thus when the demand for housing increases and the housing stock is constant, the rent will go up making it more attractive to buy real estate assets. Second, the housing stock is central in both markets. If the demand for real estate assets goes up, the construction sector will react by building new assets. This will increase the supply of space in the property market and all else being held equal, both rents and house prices will go down.

Poterba (1984) only considers one part of the asset market; the market for owner-occupied housing where the rent is considered the value obtained by owning a house. Thus, the demand for owner-occupied housing (HS^D), can therefore be expressed as a function of the rent (R) determined in the property market:

$$HS^D = f(R)$$

2.3.1 Short-term equilibrium

The housing stock (HS) which represents the supply of housing (HS^S) is considered perfectly inelastic in the short run with HS being held constant:

$$HS^S = g(HS)$$

Equilibrium in the short run is obtained by equating the existing housing stock with the demand for housing:

$$HS^S = HS^D$$

The market clearing rent is therefore the inverse demand function for housing. This represents the marginal rental value generated by the fixed housing stock.

$$R = R\big(g(HS)\big)$$
$$R' < 0$$

The demand for owner-occupied housing will exist until the marginal value of owning - the marginal rental value (R) - equals the marginal cost of owning, referred to in literature as *the user cost*. If the user cost exceeds the value of owning, people will choose to rent a house rather than owning one. Thus, one has to compare the annual cost of renting to the annual user cost when considering the attractiveness of buying. Most costs associated with owning a house, such as interest payments, depreciation, repair costs and property taxes are related to the real price of the house. The short-term steady state can therefore be expressed through the following equation, equating the annual rental value with the annual user cost: [12]

(1) $$R = \omega * P$$

P is the price in real terms and ω is the sum of mortgage interest payments, opportunity cost of housing equity, depreciation, repair and maintenance costs, property taxes, minus expected

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[12] Risk and uncertainty are not taken into account, thus portfolio desicion are not included. This are discussed in more detail in the critique of the model.

capital gains and tax savings[13]. García-Montalvo (2003) modified the user cost definition with regard to Spanish tax polices.[14]

$$\omega = (1 - \varphi)\left[[1 - \tau_{IRPF}]i + \alpha\delta - \frac{\Delta P_N^e}{P_N}\right] + \rho\tau_{IBI}$$

1.	i	Interest rate	(Opportunity) Cost of capital
2.	$\tau_{IRPF}i$	Income tax rate * interest rate	Tax savings based on interest payments
3.	$\alpha\delta$	α: Construction costs over the value of the house, δ: depreciation and maintenance costs	Depreciation and maintenance costs
4.	$\dfrac{\Delta P_N^e}{P_N}$	ΔP_N^e: Expected change in the nominal house prices, P_N: nominal house price	Capital gains/losses
5.	$\rho\tau_{IBI}$	ρ: Ratable value of the house determined by the municipal government out of the total value of the house τ_{IBI}: Property tax rate	Property tax (regional)
	φ	φ : The tax deduction rate	The deduction base consists of the four first determinants of the cost of owning (1,2,3,4)[15]

1. Interest payments (i) can be interpreted either as the interest cost on the mortgage or as the opportunity cost of capital spent on housing, for those buying a house without taking out a mortgage. Poterba (1984) assumes that households may borrow or lend

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[13] The model assumes that the opportunity cost of capital is equal to the cost of borrowing (i). For a more accurate spesification of the cost of owning including the loan to value ratio see Poterba (1984) p. 732.
[14] Based on the IRPF-reform introduced in 1998. It applies only to "Viviendas Habituales" (Main dwellings in which the buyer has to live for at least three years)
[15] This model is based on the tax legislation introduced in 1998, however, there are some deviations.

any amount at the same interest rate.[16] In Spain, one can deduct a percentage (φ) from the interest payments up to a certain limit. [17]

2. The second component is the tax savings associated with buying a house. When buying a house, the Spaniards can deduct a percentage (φ) of their capital costs from their taxes (τ_{IRPF}). This reduces their real tax rate.

3. Third, the homeowner faces depreciation, repair and maintenance costs. A simplifying assumption made to this aspect is that all houses depreciate at a constant rate δ and will require maintenance and repair expenditures equal to a fraction (α) of the house price. In Spain, these costs can also be included in the tax deduction base.

4. Expected capital gains or losses in the future $(\frac{\Delta P_N^e}{P_N})$ will indirectly affect the user cost today. The rationale is that one would avoid a future potential loss by selling a house that is expected to lose some of its value. In this case, the expectations about future house prices would increase the cost of owning. If one on the other hand expects the value to go up, keeping the house would ensure future potential capital gains, reducing the cost of owning. In Spain, capital gains are assumed to be taxed at a rate (φ).[18]

5. The final component is the property tax τ_{IBI} paid to the municipal government in proportion to a ratable value of the house (ρ).

Simplifying the tax aspects, ω can be expressed as:

$$\omega = (1 - \varphi)\left[[1 - \tau]i + \delta - \frac{\Delta P_N^e}{P_N}\right]$$

To sum up, in the short term the supply is perfectly inelastic, and the short-term steady state is obtained when the annual cost of owning equals the annual rent (value of owning). This is expressed in equation 1.[19]

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[16] An underlying assumption is that there are no credit restrictions.
[17] In this definition of the user cost, García-Montlvo assumes that interest costs, whether they be opportunity costs or actual costs provide tax deductions. A more detailed description of this deduction rate is presented under "Historical Development and Statistics"
[18] For simplicity, the tax rate is set equal to the deduction rate
[19] Defining short term, it can be mentioned that the mean construction time in Spain is 23 months, approximately two years (Ministerio de Fomento, 2008).

2.3.2 Long-term equilibrium

The house price appreciation in real terms is equal to the appreciation in nominal terms minus overall inflation (π). One must keep in mind that people's purchase decisions are based on expected price appreciation since they do not have information about actual price increases. Poterba (1984) assumes that the buyers and sellers of houses have perfect forecasts about the future path of the economy; actual inflation is therefore a perfect proxy for expected inflation:[20]

$$\frac{\Delta P_N^e}{P_N} = \frac{\dot{P}}{P} + \pi$$

Keeping this in mind, one can study real price changes by rewriting the equilibrium condition:

$$R = (1-\varphi)\left[[1-\tau]i + \delta - \frac{\Delta P_N^e}{P_N}\right] * P \qquad = \qquad R(1-\varphi)\left[[1-\tau]i + \delta - (\frac{\dot{P}}{P}+\pi)\right] * P$$

$$(1-\varphi)\dot{P} = -R + \gamma P$$

$$\gamma = (1-\varphi)[(1-\tau)i + \delta - \pi]$$

For a given initial housing stock (HS), and a real house price P, equation (2) determines the expected real capital gain needed to induce individuals to hold the entire housing stock. Assuming there are no expected real capital gains ($\dot{P} = 0$) in equilibrium, one obtains a demand curve consistent with full ownership of the housing stock and constant real house prices:

(2) $$R = \gamma P$$

The market for new construction represents the long-term supply of housing. Assuming that the construction sector is perfectly competitive, the supply is determined by its output price - the real house price (P) and construction costs (Z). The gross residential investment (I) can thus be defined as:

$$I = \psi(P, Z)$$

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[20] Some authors distinguish between actual user costs, based on real house price appreciation, and the expected user costs, based on expected house price appreciation (see Himmelberg, Mayer and Sinai, 2005).

Z includes construction costs such as material and labor.[21] The real house price P, is positively correlated with gross residential investment ($\psi'(P) > 0$). An increase in construction cost, however, would reduce the gross residential investment ($\psi'(Z) < 0$). An increase in the housing stock (HS) can therefore be defined as gross residential investment minus the depreciation of the housing stock:

$$\dot{HS} = I - \delta HS = \psi(P,Z) - \delta HS$$

Poterba (1984) assumes that the housing stock is constant in the long-term equilibrium, $\dot{HS} = 0$. The long run housing stock can therefore be defined:

(3) $$HS = \frac{\psi(P,Z)}{\delta}$$

In sum, the long-term steady state is defined simultaneously by two conditions: zero real capital gains and a constant housing stock. This is given that income and population growth are constants.[22]

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[21] In the same paper (1984) Poterba tries to incorporate land in the output function of the sector for new construction by using a Cobb Douglas production function with land and housing structures as imput factors.

[22] In a growing economy the ratio of the housing stock to real income must be constant and therefore grow at a rate $n + \eta_Y g$ where n is the population growth, g is the growth of real income per capita and η_Y is the income elasticity of demand for housing (Poterba 1984). By including population and income growth when defining depreciation of the housing stock $\delta^* = \delta + n + \eta_Y g$ one can allow for income growth: $\dot{HS} = I - \delta^* HS$.

2.3.3 Graphic presentation of the long-term equilibrium

Figure 3: Graphic presentation of the framework
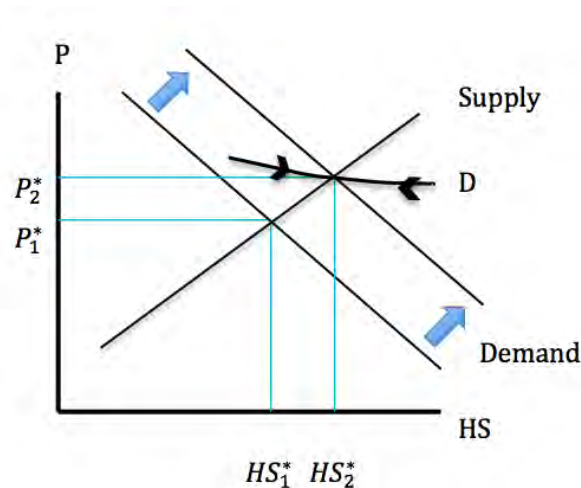
Consistent with the model, the demand curve (equation 2) decreases and the supply curve (equation 3) increases with the real price. In equilibrium (P_1^*, HS_1^*) supply equals demand. Poterba's model (1984) exhibits the saddle point stability often seen in asset market models with rational expectations. If a steady state is distributed, there is a unique path (D) along which the market will return to a new equilibrium.[23] Any reduction in the user cost[24] will cause an outward shift of the demand curve.[25] With higher demand, the price will increase to the point where HS_1^* intersects with the saddle path (D). The sector for new construction will react by increasing residential investments and gradually the market reaches a new equilibrium (P_2^*, HS_2^*). Changes in other variables not included in the model, such as an increase in the population, an increase in disposable income or lower unemployment will have the same effect and cause an outward shift of the demand curve. Considering supply factors, an increase in construction costs will cause an upward shift in the supply curve, increasing the

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[23] Poterba (1984) also demonstrates the long-term equilibrium through the assumption that a rational consumer will equate the present discounted value of owning a house with the price. For a consumer to choose to buy rather than renting, the growth in the net vaule of owning a house $(R - wP)$ must equal or be higher than the dicount rate (transversality condition). If an eqlibrium in the housing market with rational expectations is subject to a shock disturbing the equilibrum, the saddle line is the only path that satisfies the transversality condition.

[24] Such as an increase in tax deduction or reduction of interest rates.

[25] The effect of inflation is twofold: It increases the real price of houses, but it also increases the nominal interest rate. The final effect of inflation depends on the relationship between the marginal tax rate and the sensibility of interest rates to changes in inflation. The effect of increased capital gains can also have an effect on interest rates if they induce individuals to increase consumption. This could increase inflation and further nominal interest rates.

price. Faced with a higher price, consumers will reduce their demand for housing and a new equilibrium with higher prices and lower production of new construction will be reached.

2.3.4 Criticism

The model presented above, based on Poterba (1984), is a simplistic framework used to understand house price dynamics. It has been widely used in empirical studies on house prices, but some of the underlying assumptions of the model have been heavily questioned.

Madsen (2011) points out that one of the main problems associated with Poterba's (1984) model is that it is of partial equilibrium nature.[26] The consequence of only using the equilibrium for residential assets is that the interactions between different asset markets (financial assets and other durable goods), the property market and the market for residential investment are not appropriately captured. Poterba (1984) does not allow for optimizing firm behavior in the construction sector nor does he take into account household portfolio considerations.[27] Madsen (2011) presents a supply-side model of house prices allowing firm optimizing behavior in a general equilibrium environment where household portfolio considerations are taken into account. The results suggest that house prices are determined by a portfolio equilibrium in the short run, whereas the main long run determinant is the replacement cost.[28]

Another assumption for which Poterba's (1984) model is questioned is that of households having rational expectations. This is not in line with the work of Shiller (2007) on speculative bubbles.

Further, the assumption of no credit conditions in the modeling of house prices is heavily questioned by Duca, Muellbauer and Murphy (2009). Their findings imply that there *is* an effect on credit restrictions to house prices. Moreover, Anundsen and Jansen (2011) find that there is a self-reinforcing effect in the long run between changes in house prices and debt in Norway. Díaz and Luengo-Prado (2001) suggest an improvement of Poterba's (1984)

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[26] A partial equlilibrium is an equlibrium in just one part of the economy. E.g only considering asset market and disregarding investors relative propensity to invest in financial assets or other durable goods.

[27] By household portfolio considerations we refer to the desicion of households as to how much to invest in property, financial assets and consumption of non-durable goods.

[28] Mainly the price of developed land, value added taxes, stamp duties and construction costs.

estimation of the cost of owning by including transaction costs and differentiating between the cost of investing own money in housing and the cost of borrowing.

Additionally, Poterba (1984) "only considers the price of housing structures, not the composite good comprising both the structure and land, which many people think of as a house". In the paper (1984) he points out that this is an apparent weakness, since land plays an essential role in the housing market.

In sum, Poterba (1984) has been heavily criticized for assuming rational expectations, not including any credit conditions and omitting land from the model, and finally for not considering important aspects such as household portfolio decisions and firm optimizing behavior in the construction industry. Some of the strengths of the model are its simplicity and its thorough description of the user cost. Furthermore the model explains the mechanism of expectations affecting demand, even though they are perfectly rational. The model therefore gives a simple comprehension of the mechanisms in the housing market, with regard to changes in user cost, changes in housing stock and the influence of expectations.

3 Historical development and statistics

Before describing the house price development, we will give an insight into relevant historical developments in the Spanish economy as well as the development in housing policies. Chapter 3.1 provides an introduction to the economic development in Spain the last four decades, with a more thorough description of the changes associated with the entry into the European Monetary Union (EMU) in 1999. Chapter 3.2 focuses on housing policies introduced between the 1950s and the 1990s that can explain some of the peculiar characteristics of the Spanish housing stock.

With an insight into the late history of the Spanish economy and housing policies we can start to consider the development in the factors affecting demand and supply of housing. In the chapters 3.4 and 3.5 we present data on factors describing the supply and demand of housing in Spain based on the theoretical framework and some of the additional related literature from the previous chapter. As previously mentioned, most of the data originate from the National Institute of Statistics (INE) in Spain and the Ministry of Infrastructure (Ministerio de Fomento). In 2001, both institutions made significant changes in methodology and collection of the data for many indicators, impeding the possibility of computing complete time series including both new and old data sets. Some of the data are only presented from 2004/2005 when new and more sophisticated measures were introduced.

3.1 The Spanish economy

From 1970 to 2008 Spain experienced tremendous economic growth. In total, the GDP per capita increased 127 % from 1970 to 2011, see figure 4. After entering the European Community (Now EU) in 1986, GDP per capita of Spain increased by 20 % in only four years from 12 638 euros in 1986 to 15 127 in 1990. Apart from a small setback in 1993, when Spain suffered a reduction of 1.3 % in GDP per capita, the country experienced 14 years with strong growth from 1994 to 2007.

Figure 4: Real GDP per capita (thousand euros) 1970-2011. [29]
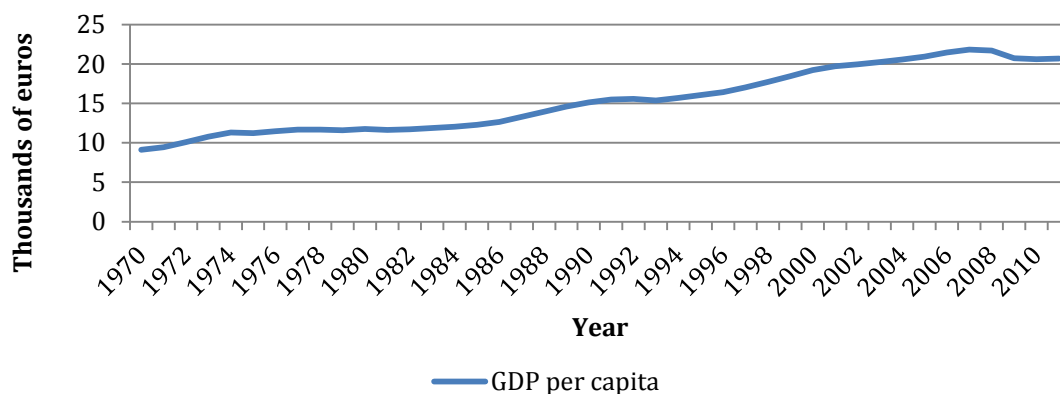
— GDP per capita

Spain had one of the higher growth rates among the EU countries and nearly doubled its GDP per capita in the period from 1970 to 1998. Figure 5 shows the growth gross domestic product (GDP) per capita in Spain and other European countries from 1970 to 1996, 1997 to 2007 and 1999 to 2007 respectively.

Figure 5: Compound average growth rates in GDP per capita in various countries in different periods (%). [30]
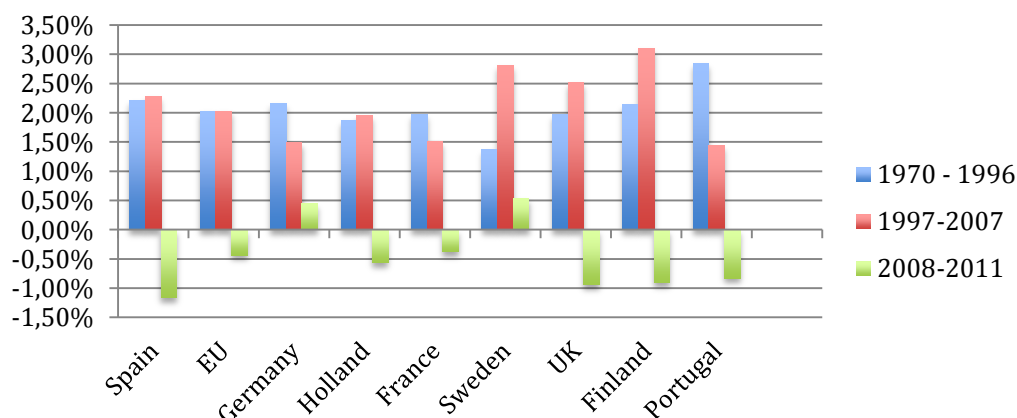
Together with the rest of the EU, Spain experienced a drop in the growth rate from 2008. During the 4 years from 2008 to 2011, the growth in GDP per capita of Spain was negative every year with a total reduction of 5 %. The EU countries had an average decline of 0.5 % in the period 2008 to 2011.

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[29] WDI (2012a).

[30] WDI (2012b), based on constant 2000 US$. Compound average growth rate: $CAGR = \sqrt[n]{\frac{End\ value}{Initial\ value}} - 1$

In spite of a high growth in GDP per capita towards 2007, Spain struggled in the 90s to meet the criteria necessary to enter the EMU (Rojo, 2009). In 1992 The Maastricht Treaty was signed by the member states of the EU providing convergence criteria that countries had to meet before entering the EMU. At this time, Spain among other countries was experiencing stagnation in the economy. The GDP per capita from 1991 to 1994, stayed at a level around 15 500 euros. During these years an increase by only 1.3 % was seen, compared to the EU average of 2.7 %. According to Ayuso, Kaminsky and López-Salido (2003) the public deficit increased from 3.3 % to 7.5 % of GDP in the years between 1988 and 1993. At the same time, government debt reached approximately 60 % of GDP in 1993. This recession led to a surge in the unemployment rate, going from 16 % in 1990 to approximately 24 % in 1994 (OECD statistics, 2012a). Intending to get the economy stabilized the peseta was devaluated several times in this period, leading inflation to reach a level of around 5 % in 1994 (INE, 2012a). With imbalances appearing, as well as being one of the bigger economies within the Union, the EU Commission closely scrutinized Spain (Rojo, 2009). As a result, in the mid-1990s the country was one of the member states with the most difficulties reaching the requirements (Rojo, 2009). However, the implementation of several anti-inflationary policies in 1994, in addition to receiving Cohesion Funds from the EU aimed at facilitating the process for countries with lower welfare to meet the criteria, reduced inflation to 2 % by 1997 (Ayuso, Kaminsky and López-Salido, 2003). With lower inflation, the result was entry into the EMU in 1999. After entering the EMU, the European Central Bank sets the interest rate and Spain no longer has the capability to alter the interest rate to stabilize the economy of the country. According to Estrada and Jimeno (2009), the real interest rate reached an abnormal low level at the beginning of the EMU period, with real interest rates between -1 % and 1 % from 1999 to 2005.

Figure 6: Annual inflation (%) 1990-2011.[31]
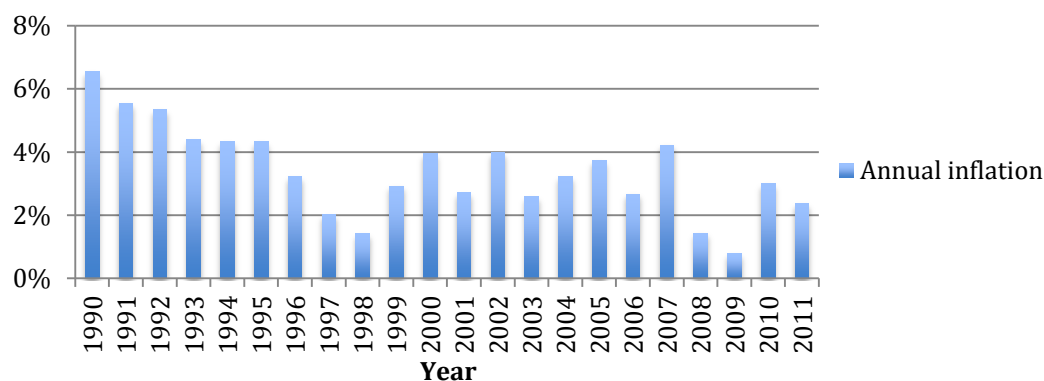
Figure 6 demonstrates how the inflation in Spain dropped from around 6.5 % in 1990 to 1.4 % in 1998. Higher levels, of between 2.6 % and 4.2 %, were observed from 1999 to 2007, before inflation dropped to 1.4 % and 0.79 % in 2008 and 2009 respectively. In 2010 and 2011 inflation recovered to levels between 2 % and 3 %.

The construction sector plays a central role in the Spanish economy compared to other countries. Between 1990 and 2000 the gross value added (GVA)[32] of the sector amounted to a total of 9 % (García-Montalvo, 2003).[33] The GVA is a measure of the output disregarding taxes and subsidies on the products. While there was an increase of 26 % in real GDP from the first trimester of 1997 until the last trimester of 2002, an increase of as much as 71.5 % was seen in the GVA of the construction sector. The sector has also been important in terms of employment compared to other countries. In 2007, Spain had the highest number of people employed in the construction sector compared to the other EU-countries, with a total of 2.9 million people (Eurostat, 2012) representing around 12 % of the working population. Poland is the only country in the EU that has a higher share of employment in the construction sector. The employment in the construction sector changed dramatically in the first quarter of 2008, see figure 7 (INE, 2012b). This figure shows a stable, increasing trend with a year- on- year growth rate of between 2.2 % to 3.9 % every year from 2000 to the first quarter of 2008. The second quarter of 2008, however, was the start of a constant decline with rates varying from -0.6 % to the highest year- on- year decline of 6.7 % which was observed from the third

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[31] Inflation eu (2012)
[32] GVA + taxes on products - subsidies on products = GDP
[33] In comparison, the construction sector in Norway contributes under the same terms with less than 4 % to total GVA.

quarter of 2008 to the third quarter of 2009. Figure 7 shows that the share of employment in the construction sector was reduced by half between 2008 and 2012.

Figure 7: People employed in the construction sector (% of total population employed) 2000-2012 second quarter.[34]

% of total employed in the construction sector
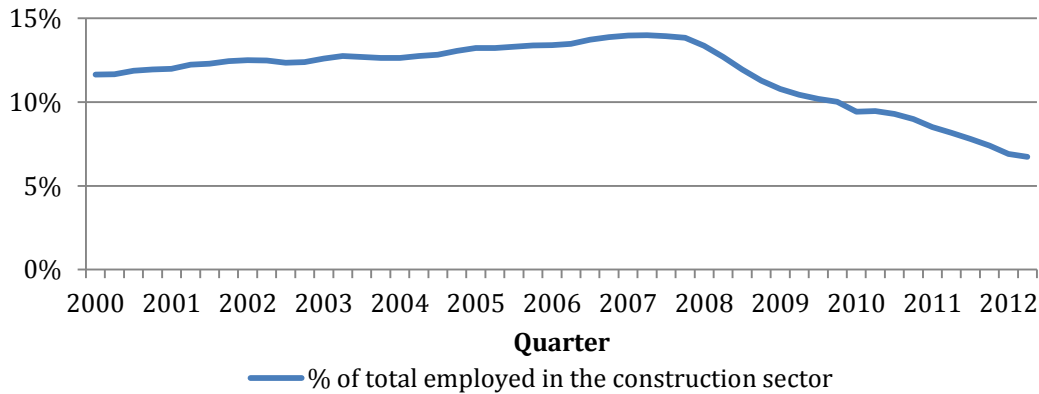
3.2 Spanish housing policies

Like in all welfare states, there has been a relatively strong regulation of the Spanish housing market affecting both supply and demand. Some of the regulations and mentality regarding housing established during Franco's dictatorship still have an impact on the characteristics of the Spanish housing stock. An insight into the history of Spanish housing policies is therefore important in order to understand the current housing market in the country. Laws regarding rental houses, land regulation and tax incentives for home-purchase have been of particular importance and are emphasized.[35] Policies introduced after 1990 are presented in chapters 3.4 and 3.5, together with data showing their effects on supply and demand.

During his dictatorship, one of Franco's most important tasks was to rebuild the housing stock after the extensive destruction during the Civil War. The National Institute of Housing was established with the aim of incentivizing construction of protected houses (Viviendas

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[34] INE (2012b)
[35] This chapter is based on Belsky and Retsinas, 2004 .

protegidas).[36] The developers of protected houses would receive major subsidies from the government, but face restrictions such as a rent cap or maximum sales price of 20 % of the tenant's or buyer's income. The aim was to drive the construction of homes for lower income families. In 1954, subsidies were also given to private developers, due to the major undersupply of houses, but they faced no restrictions with regard to rents or sales prices. After 1954 the production of unrestricted homes (viviendas libres)[37] spiked and outpaced that of public production (viviendas protegidas).

During the same period, Franco has been accused of destroying the Spanish rental market by introducing the rental laws (Leyes de Arrendamientos) of 1946, 1955 and 1964. These laws introduced significant limitations of the power of landlords. Tenants were to be offered indefinite contracts, renewed every year if the tenant wanted to continue to live there. Moreover, the rents were to be fixed and could only increase in line with the consumer price index. The house could be sold, but the tenant had the right to buy the house at a discount increasing with the number of years he had lived there (Betrán, 2002). At the same time the Franco regime created a mentality idealizing the homeowner by stating: "Spain is a country of homeowners, not tenants" (Delgado-Jiménez, 2010) [38]. This, coupled with major subsidies, grants and favorable borrowing terms to the construction sector, spiked the investment in construction of owner-occupied houses at the expense of that of rental houses.

Franco's policies were successful in creating a housing stock. However, a great deal of the subsidies in housing did not accrue to buyers, but to developers as an additional profit. The policies failed at providing houses for the population with lower incomes levels: Despite an oversupply of housing relative to the number of households, slums and poor quality housing remained a reality.

Shortly after the death of Franco, the 1976 Social Housing Act was introduced to address this. Economic incentives to builders were removed in favor of subsidies to loans to be made by

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[36] Protected houses (Viviendas Protegídas) are under government restriction with regard to rents and prices. The aim is to be able to ensure dignified housing to citizens with lower incomes (Ministerio de Fomento, 2012a).
[37] Unrestricted houses (Viviedas libres) are houses which are not under government protection. They can be traded without restriction between buyer and seller (Ministerio de Fomento, 2012b)
[38] Spanish translation: "Queremos un país de propietarios, no de proletarios." José Luís Arrese, the Minister of Housing, 1957.

commercial banks and Saving Banks (Cajas) at 95 % loan to value (LTV) ratio[39] with 4 % interest rates and 25-year terms. However, once again, the policy failed at incentivizing construction of new and affordable housing due to oversupply and a reluctance to lend to households at lower income levels, to whom the act was targeted initially. The housing affordability increased after the death of Franco, but not to the extent the policy makers had expected.

3.2.1 Post-Franco land regulation

Since 1956 Spanish land has been classified into three types: One type consists of "Urban land" which is ready for construction with access to water, roads and electricity. The second type refers to "developable land" available to be developed for construction. [40] Finally, the third type is "rustic land" referring to protected land, farmland, pasture or forest (Betrán, 2002). The legislation of Franco contributed to a major expansion of urban land, building new and bigger cities. After his death and the introduction of the first Land Law of 1975, the urbanization of land increased significantly.[41] Between 1985 and 2000, more land was urbanized than ever before at a much higher rate than population growth and demographics would imply (Betrán, 2002). The new land reform of 1990 was an extension of the first reform with the aim of reducing the price of land to improve housing affordability.[42] The law increased the supply of land by expanding the land classified as developable at the expense of rustic land.

3.2.2 Post-Franco rental policies

The rental law of 1985 and 1994 were other government attempts to reduce house prices: These were aimed at liberalizing the rental laws. Allowing for rents to increase and giving the landlords more power, was thought to encourage the construction of rental housing, push

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[39] $Loan\ to\ value\ ratio = \frac{Amount\ of\ mortgage}{Value\ of\ house}$

[40] Developable land can be further decomposed into land to be developed right now (Suelo urbanizable programado), and land to be developed in the future according to the plans of the municipality (Suelo no programado).

[41] See Ley 18/1975 (New land reform with new classifications)

[42] See Ley 8/1990 (The Socialist Reform increasing the supply of developable land) La reforma Socialista

rental prices down and consequently house prices would decline as well (Betrán, 2002). However, both rental prices and house prices went up after the new rental laws were introduced and the rental share continued to go down (García-Montalvo, 2003).

3.2.3 Post-Franco tax incentives

One possible reason for the failure of the liberalized rental laws in increasing the rental share might be the previous introduction of a tax deduction of 15 % of the cost of buying a house.[43] The effect of the tax policies, introduced in 1978, was twofold. First, one could get a tax deduction of any capital gain associated with the sale of a house on the condition that this would be reinvested in dwellings.[44] Second, 15 % of the amounts spent on housing investments in the period, including loan installments and private equity could be deducted from the homeowners' taxes. Private equity that had already been deducted because of reinvestment in housing, were not included in the deduction base of 15 %. Until 1998 interest costs were not included in the deduction base. These laws remained, with minor changes, until 1998 (Fuenmayor and Granell, 2010)[45].

3.3 Spanish house prices

In this chapter a presentation of the house price development is provided. Some attention is also dedicated to regional differences.

Despite turbulence in the inflation, interest rates and unemployment in the beginning of the 1990s, the increase in house prices was fairly stable in the second half of the 1990s. Prices went from 670.8 euros per square meter in 1995 to 780.3 euros per square meter in 1999, a total increase of 15 %. House prices continued to escalate after this, but more quickly. Figure 8 illustrates the development in the house price index from the first quarter of 1995 to the second quarter of 2012. The highest year- on- year growth rate in this period was seen

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[43] This tax deduction is discussed in more detail under in chapter 3.5.3
[44] This deduction only applied to primary dwellings
[45] Ley 74/1989 (art 36), Law 40/1998 (art. 36.1), Law 50/1984 (Tax incentives for house purchase)

between the fourth quarter of 2002 and the fourth quarter of 2003 with a growth of 18.5 %, going from 1164.6 to 1380.3 euros per square meter.

The annual growth rates from 1995 to 2007 were positive each year, with prices reaching their peak at 2101.4 euros per square meter in the third quarter of 2008. After the Financial Crisis hit Spain in 2008, the prices have declined every single quarter. In the second quarter of 2012 house prices were back at their 2004 level, approximately 1600 euros per square meter.

Figure 8: Nominal house price index (1995 = 100) 1995-2012 second quarter.[46]
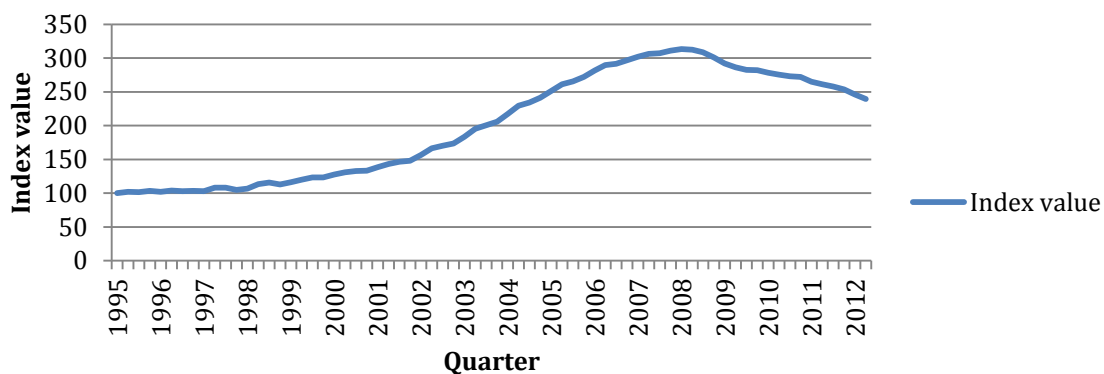
3.3.1 House prices in the autonomous communities of Spain

Spain is one of the largest countries in Europe, and consists of 17 autonomous communities (regions). The most industrialized regions of Spain are Catalonia, Basque Country and Madrid, whereas the regions on the peninsula attracting the most tourists are Madrid and the regions on the Mediterranean coast (Rasmussen, 2008). The development in the house prices in the coastal regions, Catalonia, Madrid and Basque Country are presented in figure 9, which displays the development in nominal terms from the first quarter of 1995 to the second quarter of 2012.[47]

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[46] Ministerio de Fomento (2012c)
[47] The coastal regions consists of the regions on the Mediterranean coast; Andalucía, Murcía and Valencia. The arithmetic mean of the house prices makes the total value. Catalonia is excluded and included seperately.

Figure 9: Nominal house prices (euros per square meter) 1995-2012 second quarter.[48]
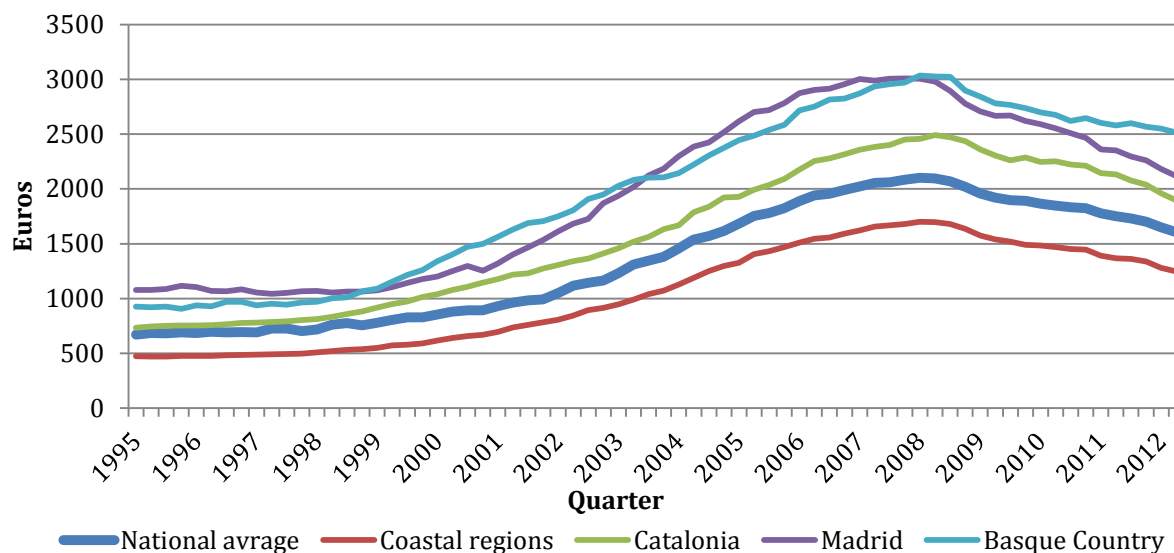
The overall trend is the same in all the regions, with fairly stable prices and a small increase from 1995 throughout 1997. The prices in all the regions started to escalate after 1997, especially in Catalonia and Basque Country with a year- on- year growth rate of 13 % and 12 % respectively from the first quarter of 1998 to the first quarter of 1999. Basque Country experienced an enormous growth in 1999 of 23 %, while Madrid experienced three years, from the first quarter of 2001 to the first quarter of 2004, with an annual growth rate of approximately 20 %. The year- on- year growth in the first quarter is illustrated in figure 10.

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[48] Ministerio de Fomento (2012c)

Figure 10: Year- on- year changes in house prices (%) from the first quarter, 1995-2011. [49]
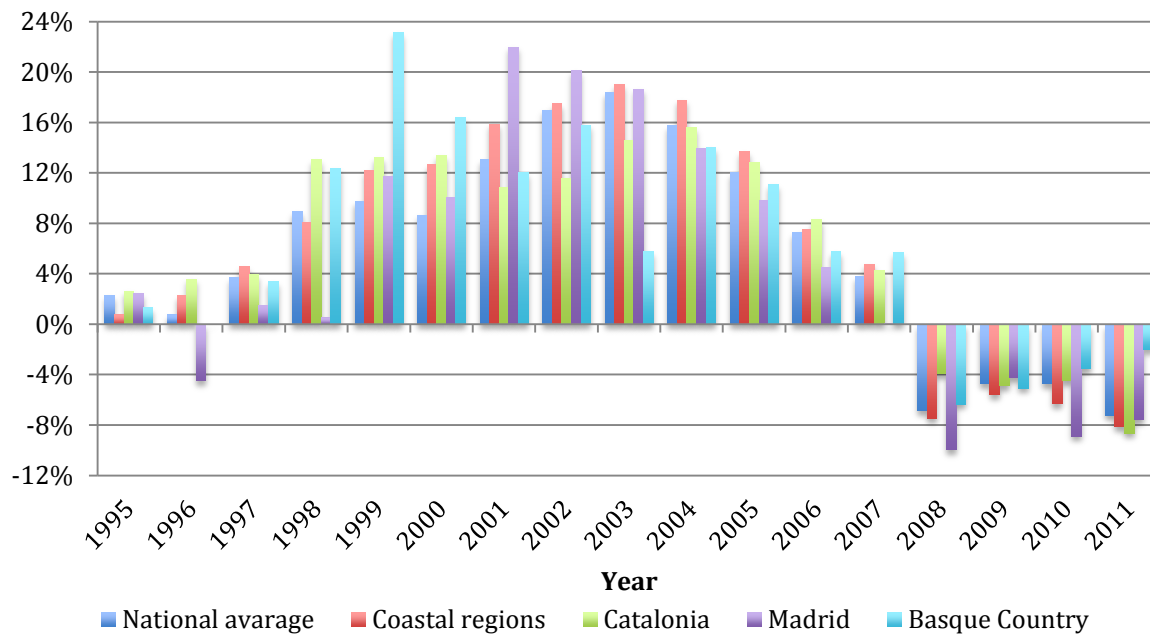
From 1998 until the peak in 2008 the price level in all the regions increased dramatically until the second quarter of 2008. The only exception was Madrid, which stagnated first, before experiencing a rather abrupt decline of 11.3 % from the first quarter of 2008 to the second quarter of 2009. The prices in the industrialized regions, Madrid, Basque Country and Catalonia, were above the national average throughout the entire period.

From 1995 until the first quarter of 2008, the prices nearly tripled in all regions, see figure 11 for index values. From the first quarter of 2008 until the second quarter of 2012, prices have been reduced with 30 % in Madrid, 27 % in the coastal regions, 23 % in Catalonia and 17 % in Basque Country.

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[49] Ministerio de Fomento (2012a)

Figure 11: Nominal house price index (2008 first quarter =100) 1995-2012 second quarter.[50]
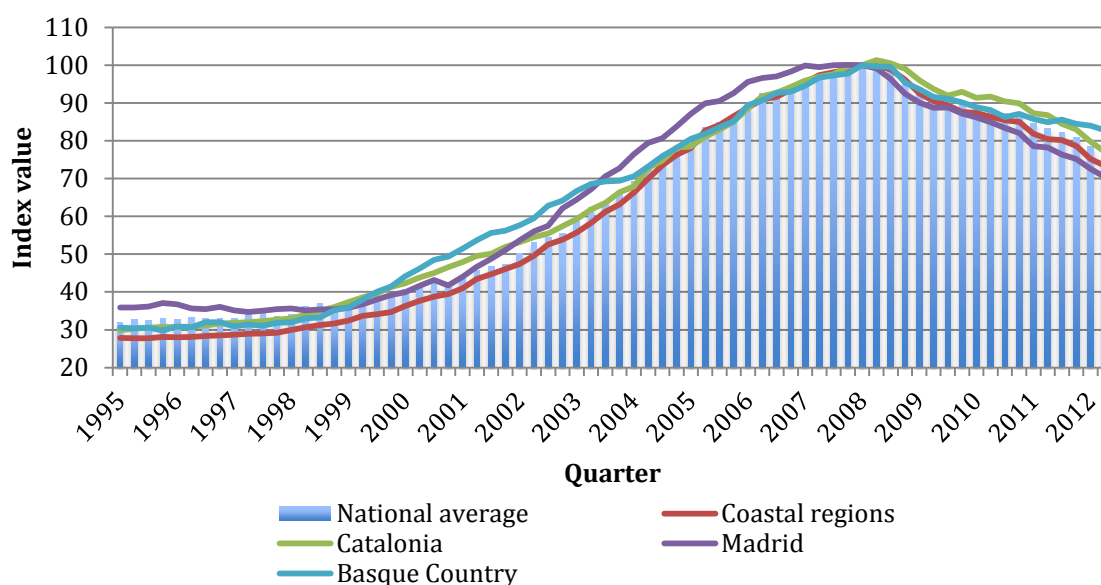
3.4 Drivers of supply

In this chapter we present data on factors describing the supply of housing such as the housing stock and construction costs. We also look at some characteristics of the Spanish housing stock, which are different from other countries in Europe. One of the peculiarities associated with housing supply is the relatively inelastic supply of housing. We will therefore also present a description of laws affecting land regulation after 1997 as well as the development in the price of land.

3.4.1 Characteristics of the Spanish housing stock

Figure 12 exhibits an estimation of the development in the Spanish housing stock between 1970 and 2011.[51] The total housing stock represents all houses, whether they be occupied or not, rentals or owner-occupied. "Principal residences" are defined as the main dwelling in which one or more people live most of the time. "Non-principal residences" are all houses

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[50] Ministerio de Fomento (2012c)
[51] Ministerio de Fomento (2012f) provides a specification of the methodology used in the estimation of the housing stock.

that cannot be classified as principal, such as vacation houses and unoccupied houses (Ministerio de Fomento, 2012e).

Figure 12: Development in the Spanish housing stock (million houses) 1979-2011. [52]
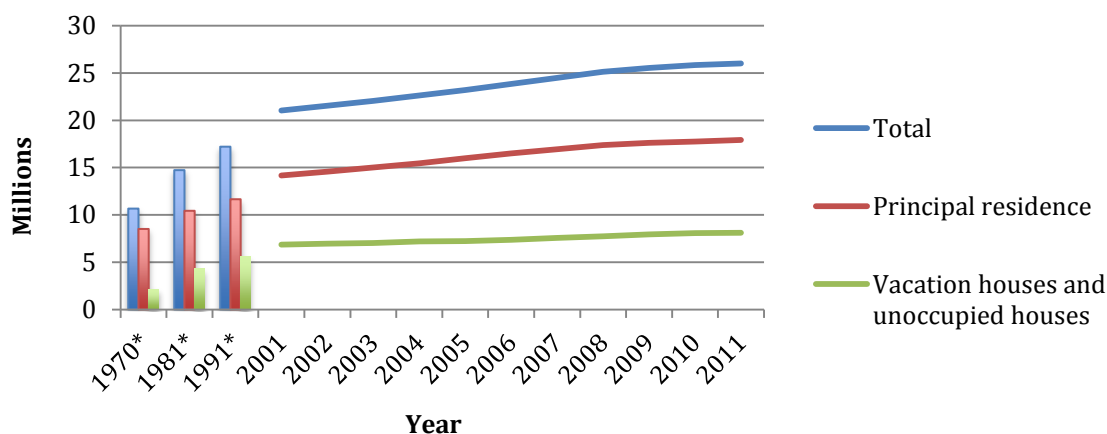
Figure 12 demonstrates that the total housing stock expanded from around 10 million in 1970 to approximately 17 million houses in 1991, a growth of 7 million houses in 20 years. In spite of the high development of new houses until 1991, the housing stock has experienced a spectacular expansion from 2001 to 2011, a period strongly influenced by what is referred to as the construction boom (1997-2007). The figure exhibits a 24 % expansion of the housing stock between 2001 and 2011, an increase of 5 million houses in only 9 years. We can see that the proportion of principal residences and non-principal residences is relatively stable after 2001, although the increase in principal residences is somewhat higher than that of non-principal residences. [53]

When comparing the Spanish housing stock to that of other European countries it is worth mentioning that Spain has the second highest share of vacation houses[54] and the highest share of unoccupied houses (García-Montalvo, 2003). Table 1 describes the development in the number of unoccupied houses since 1981, demonstrating that the share of unoccupied houses out of the total housing stock has stayed relatively stable the last 40 years.

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[52] * Ministerio de Fomento (2012d) from 2001 to 2011 and Banco de España (2012a) from 1970 to 2001
[53] Non-principal residences expanded significantly in the period 1970-1991, but the proportion out of the total housing stock has remained relatively stable ever since (García-Montalvo, 2003).
[54] Only Greece has more secondary housing than Spain.

Table 1: The number of unoccupied houses in Spain 1981-2010. [55]

	1981	**1991**	**2001**	*2010*
Unoccupied	2 396 205	2 471 053	2 894 986	3 417 064
Share out of total housing stock	16.27 %	14.40 %	13.90 %	13.20 %

It is also worth mentioning that the rental share as a proportion of main dwellings (primary residences) in Spain is among the lowest in Europe, with a strong negative development between 1960 and 2000 (García-Montalvo, 2003). This development is illustrated in figure 13.

Figure 13: The rental share out of the total housing stock by country (%) 1960-2000. [56]
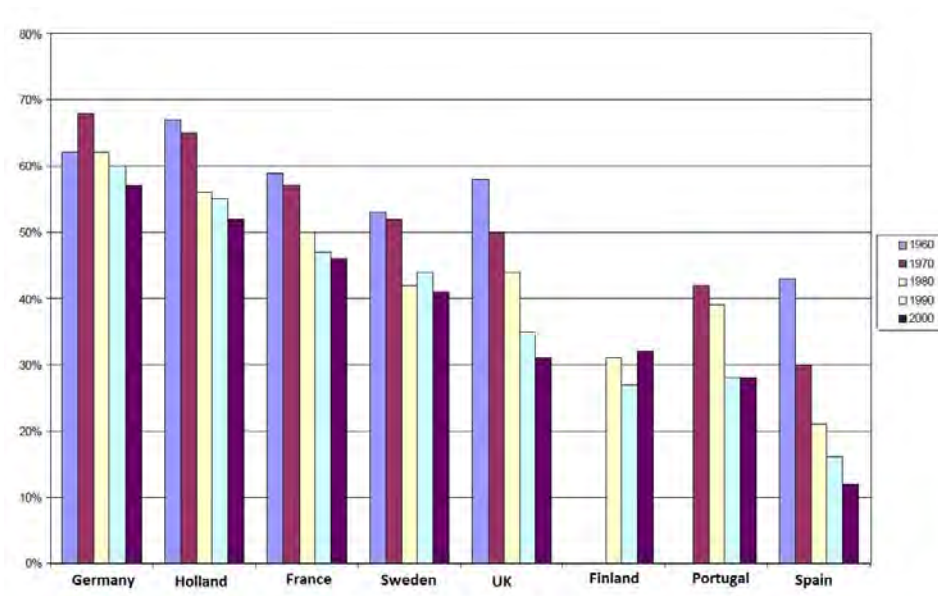
Data on the rental share between 2001 and 2005 are not available, but according to INE (2012c) the rental share increased from 13.6 % to 16.1% between 2006 and 2010. This is illustrated in appendix 3.

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[55] Estimations by INE (2001) from 1981 - 2001 and LCD (2010) for 2010.
[56] García-Montalvo (2003)

3.4.2 New construction

Data on the number of initiated and completed houses describe the output of the sector for new residential construction.[57] Ever since 1995, the numbers of initiated as well as completed houses have grown spectacularly (INE, 2012d). Figure 14 shows that the number of initiated houses from 1997 to 2006 nearly doubled. Both indicators peak in 2006 followed by a dramatic fall in initiated houses. The levels of new construction observed in July 2012 are lower than 1995 levels (INE, 2012d). The figure also shows the accumulation of unsold houses from 2004 to 2011 which increased six-fold in the period.[58]

Figure 14: Number of initiated, completed and unsold houses (thousands) 1995-2011.[59]
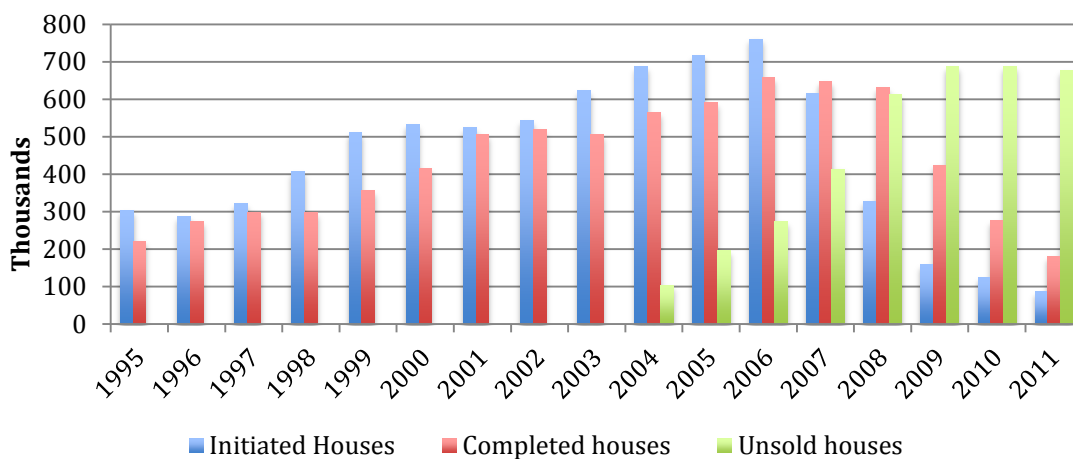
Construction costs

We were not able to find primary data on construction costs from before 2005, but Moro and Nuño (2011) have obtained data from the Ministry of Housing (Ministerio de Vivienda), which was replaced by the Ministry of Infrastructure (Ministerio de Fomento) in 2004. Figure 15 shows the development of construction costs relative to the development in house prices from 1995 to 2007. Between 1995 and 1998 construction costs increased more or less at the

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[57] These data only include unrestricted houses (Viviendas Libres) and not restricted houses (Viviendas Protegidas)

[58] Data prior to 2004 are not available.

[59] (INE, 2012d).

same rate as house prices. From 1999 to 2007, however, house prices doubled[60] while construction costs increased by less than 40%.

Figure 15: Normalized construction costs and house prices (1995 = 1) 1995-2007.[61]
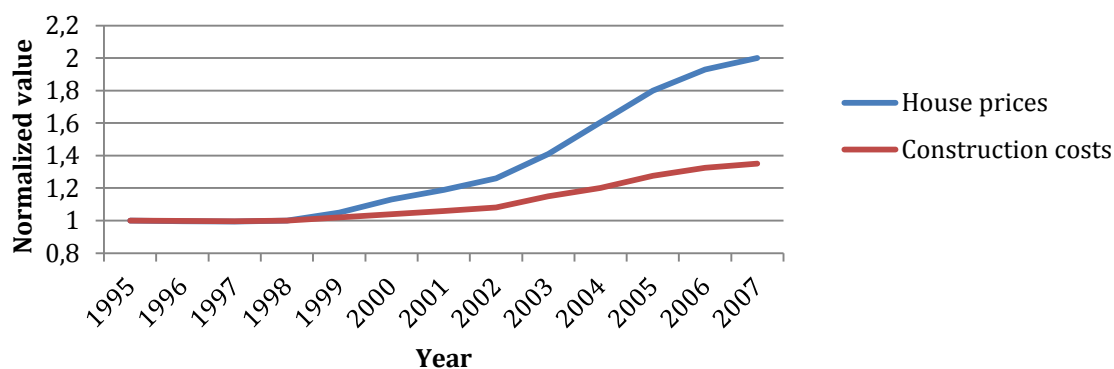
In 2005 the Spanish Ministry of Infrastructure developed an index of the construction costs in the residential sector based on the cost of different materials and labor. Two indicators have been used: a weighted relationship between the cost of different materials and a weighted relationship between both the cost of materials and labor.

Figure 16: Residential construction cost index and house price index (January 2005 = 100) 2005-2011.[62]

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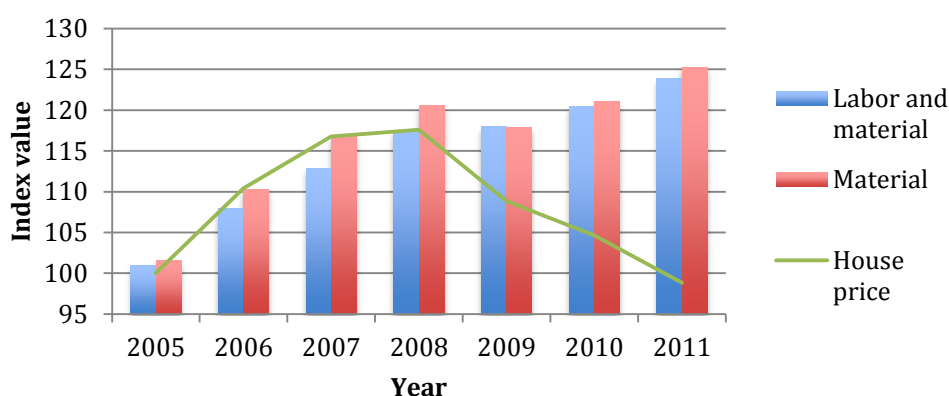
[60] Data from Ministerio de Vivienda (replaced by Ministerio de Fomento in 2004) indicate that house prices doubled between 1997 and 2007, however, newer methodologies used by INE imply that house prices tripled.
[61] Our own elaboration copied from Moro and Nuño (2011) based on data from Ministry of Vivienda (The Ministry of Housing). According to this data, the house prices doubled between 1997 and 2007, however, newer methodologies used by INE imply that house prices tripled.
[62] Ministerio de Fomento (2012g)

Figure 16 shows that the weighted cost of labor and material increased every year from 2005 to 2011, although with a lower increase in 2008 and 2009. The weighted costs of materials alone increased towards 2008, before decreasing towards 2009. In both 2010 and 2011 the material costs increased. From the graph we understand that prices of material are more volatile than the cost of labor, which is often regulated by the government.

Construction time

According to data from Ministerio de Fomento (2008) the average time from the initiation of the construction until the house is completed is 23 months. This is illustrated in figure 17.

Figure 17: Construction time (months), and number of houses.[63]
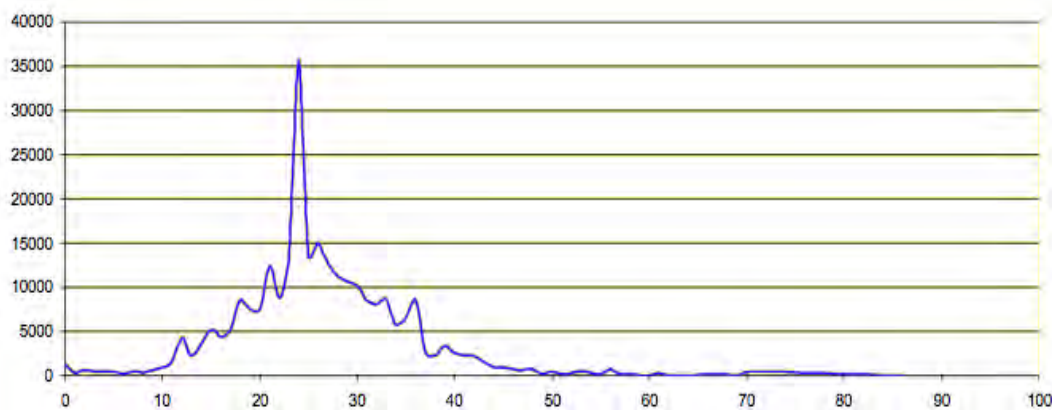
This could be a proxy for the time it takes for supply to adjust to demand, and confirms the inelasticity of supply in the short run. The law of construction planning states that the permits needed for construction are issued by the different City Councils.[64] Depending on the type of construction, the Councils allow a time period between six months and to 24 months to complete the building.

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[63] Ministerio de Fomento (2008)
[64] Ley 38/1999 (Ley de ordenación de la edificación)

3.4.3 Regulation and the price of land

Following the land law of 1990[65], the new land law of 1997[66] facilitated the increase of supply with the aim of reducing house prices. All land that was not already urban could now be considered developable, if there were no reasons for preserving it. This liberalization of the regulation caused a significant increase in the supply of land. According to Garriga (2010), the supply of land increased by 28% after 1998. After the period referred to as the housing boom (1997-2007) the government introduced a new land law with stricter regulations to decrease the supply of land available for construction significantly (Baeza and Fernández, 2007).[67]

Figure 18, obtained from the MBQ Group (2011) with primary data from Ministry of Housing (Ministerio de Vivienda) shows the development in the price of urban land relative to house prices and the consumer price index. The graph clearly shows that the price of land increased at a significantly higher pace than that of house prices: While house prices tripled from 1995 to 2007, the price of land increased more than eightfold.

Figure 18: Index of the price of land (dark line), the house price index (grey line), and the development in the consumer price index (light grey line) (1995 = 100) (1995-2008).[68]

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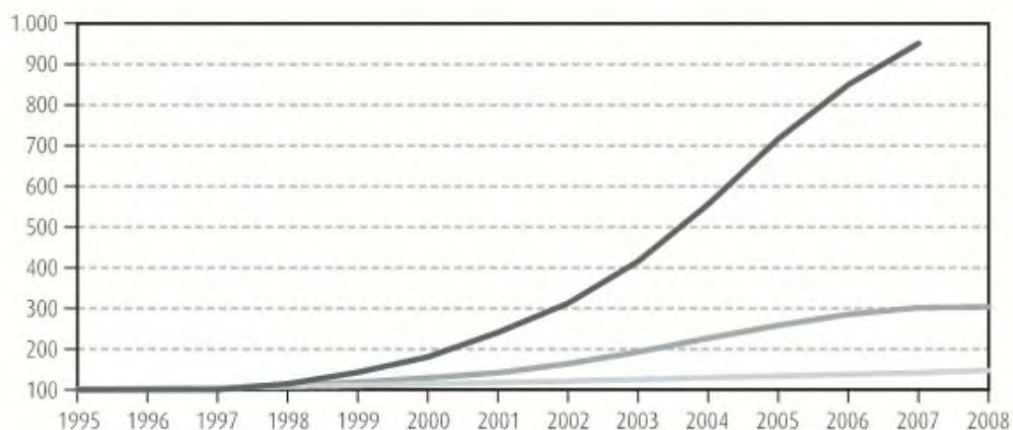
[65] Presented in chapter 3.2 Ley 8/1990 (La Reforma Socialista)
[66] Ley 7/1997 (Liberalización del Suelo - Liberalization of land regulation)
[67] Ley 8/2007 (Impeding the possibility of rural land becomming developable)
[68] Elaboration of the MBQ-group (2011) initial source: Ministerio de Fomento.

After 2004, more precise measurements of the price of land were introduced. Figure 19 shows the development in the price of urban land from 2004 to 2012. In line with the data in figure 18, the price of urban land had an upward sloping trend between 2004 and 2007, followed by a slowly decreasing trend until 2012, with somewhat higher prices in 2010 and 2011.[69]

Figure 19: The price of urban land (euros per square meter) 2004-2012.[70]
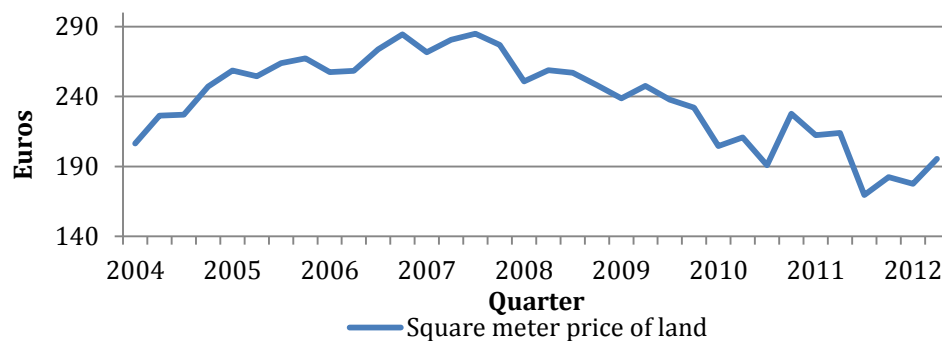
The Bank of Bilbao Vizcaya Argentaria, (BBVA, 2010) uses a different approach to analyze urban land and its relevance for the increase house prices. They calculate the total capital invested in land used for the existing housing stock as a proportion of the total capital invested in the housing stock from 1990 onwards (see figure 20). The difference between these two values can be an estimation of the capital invested the building (housing structure) alone. It is important to stress that the housing stock increased significantly in this period, but what is intriguing about this data is that the total investment in land increased at a significantly higher pace than the total investment in "housing structures" from 1997 onwards. Figure 21 shows that the proportion invested in land increased from 22 % in 1997 to 46 % in 2007.

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[69] Unfortunately there is no data available on the square meter price of land prior to 2004
[70] Ministerio de Fomento (2012h)

Figure 20: Capital stock in housing: construction and land (billions) 1990-2009.[71]
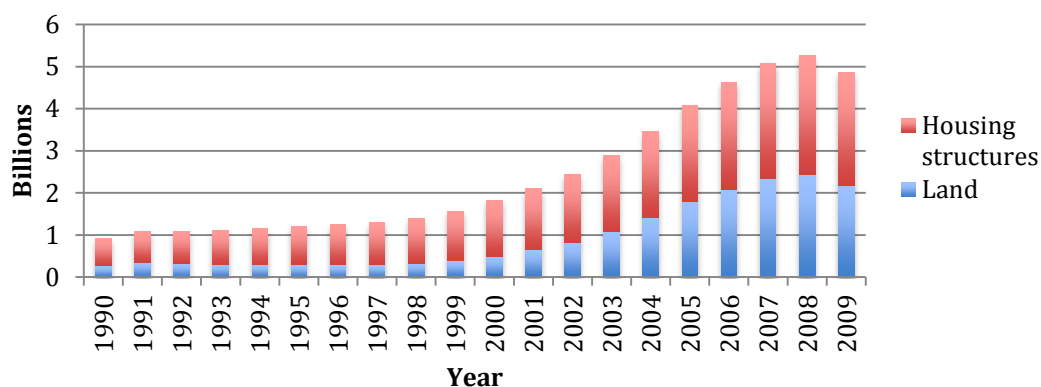
Figure 21: The ratio of investments in land out of investments in housing (%) 1990-2009.[72]
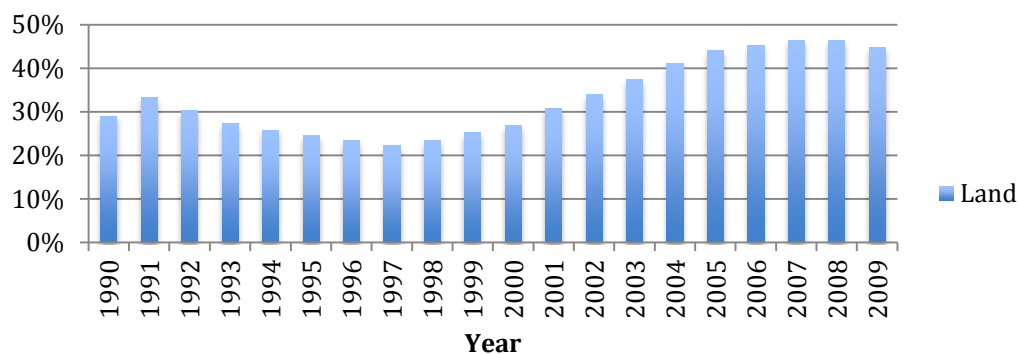
3.5 Drivers of demand

In this chapter we present factors explaining the demand for housing such as disposable income and demographic factors. We have also chosen to include unemployment rates, which can have a significant effect on disposable income. We put an extra emphasis on youth unemployment. Poterba (1984) point out the interest rate, tax deduction and expectations as central components of the user cost for housing. Data on these drivers, which are essential components of housing demand, are also presented. The rental cost can be an indicator for the value of owning a house and is therefore presented. Existing literature imply that the

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[71] BBVA (2012)
[72] BBVA (2012)

availability of credit affects house prices. Finally, we therefore present the credit development in Spain between 1997 and 2012.

Figure 22 shows the number of residential real estate transactions each quarter between January 2004 and June 2012 and demonstrates that the demand for housing dropped dramatically from the fourth quarter of 2006 to 2009 with a slower decreasing trend thereafter.

Figure 22: Number of residential real estate transactions per quarter (thousands) 2004-2012 second quarter.[73]
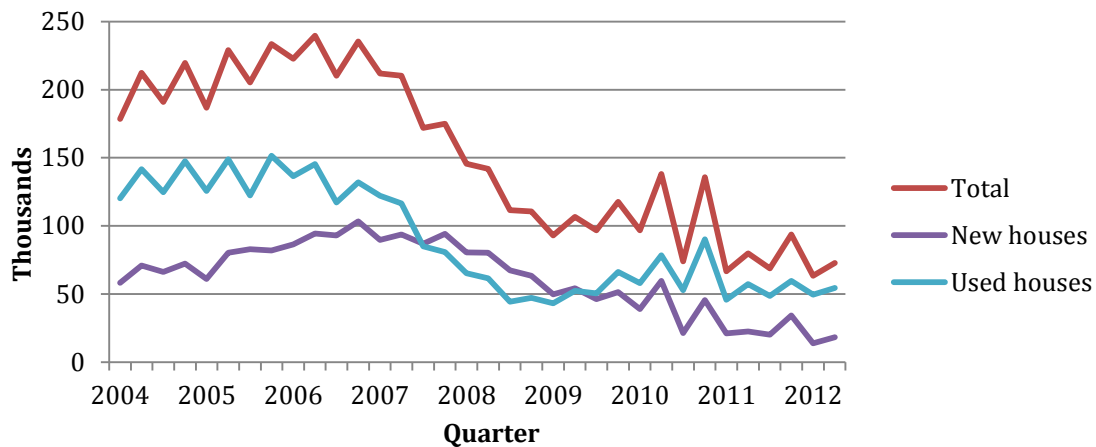
3.5.1 Income and unemployment

From the theoretical presentation we have that income might be an important driver of demand for housing. Figure 23 shows the development in real net disposable income per capita in the period 1995 to 2011.

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[73] Ministerio de Fomento (2012i)

Figure 23: Real net disposable income per capita (thousand euros) 2000-2011.[74]
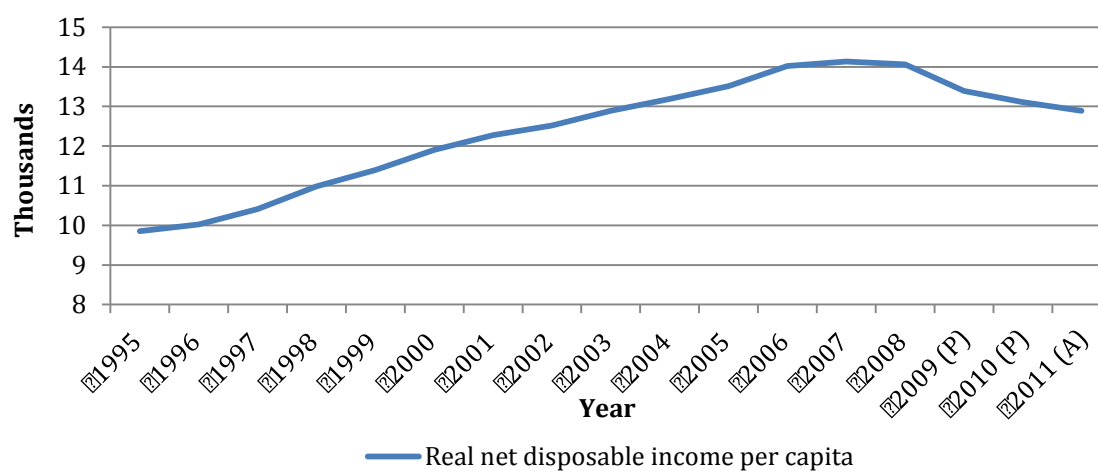
The real net disposable income increased steadily with an average annual growth rate of 3.06 % from 1995 to 2006. A reduction in the in disposable income was observed between 2007 and 2011. The average annual growth rate from 2007 to 2010 was -2.27 %, but from 2008 to 2009 a reduction of as much as 4.73% was observed.

Unemployment rate

Figure 24 shows the development in the unemployment rate from 1995 to 2011. During the first six years from 1995 to 2001, the rate declined from 19 % to 10 %. Between 2001 and 2008 the rate stabilized between 8 % and 11 %. Between 2009 and the second quarter of 2012, the rate more than doubled, going from 11 % to 25 %.

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[74] INE (2012f) The data from 2009 and 2010 are based on provisional estimates, while the data from 2011 are based on an advance estimate. We have discounted for inflation ourselves.

Figure 24: Total unemployment rate, all ages and both genders (%) 1995-2012 second quarter.[75]
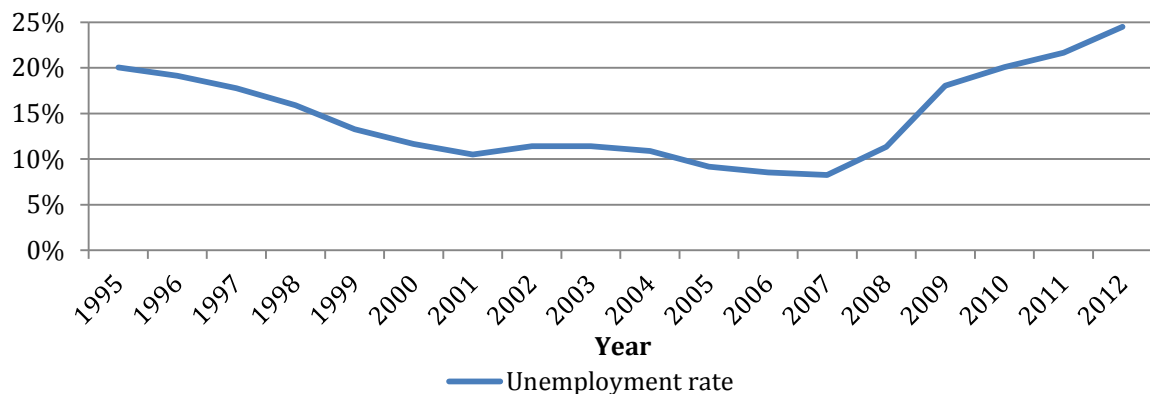
Unemployment in the start-up phase

Figure 25 shows the unemployment rate among young adults in the age group between 20-34, illustrating the differences between the groups 20-24, 25-29 and 30-34 years. Throughout the entire period, the age group 20-24 has had the highest unemployment rate. After staying at a level around 15 % between 2005 and 2007, the unemployment rate in this age group increased to around 20 % in 2008, before rising to an historic high level of 48.9 % in the second quarter of 2012. A tremendous growth of 33 percentage points was observed between the second quarter of 2005 and the second quarter of 2012. As for the age group 25-29, an increase of 21 percentage points was seen in the same period, reaching 31.1 % in the second quarter of 2012, and the rate for the 30-34 year-olds had an increase of 16.7 percentage points, ending up at 24.4 %.

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[75] Unemployment in 2012 is the avrage based on the two first quarters (OECD statistics, 2012a).

Figure 25: Unemployment rate for both genders, age groups 20-24 years, 25-29 years, 30-34 years and average rate for the age group 20-34 (%) 2005-2012 second quarter.[76]
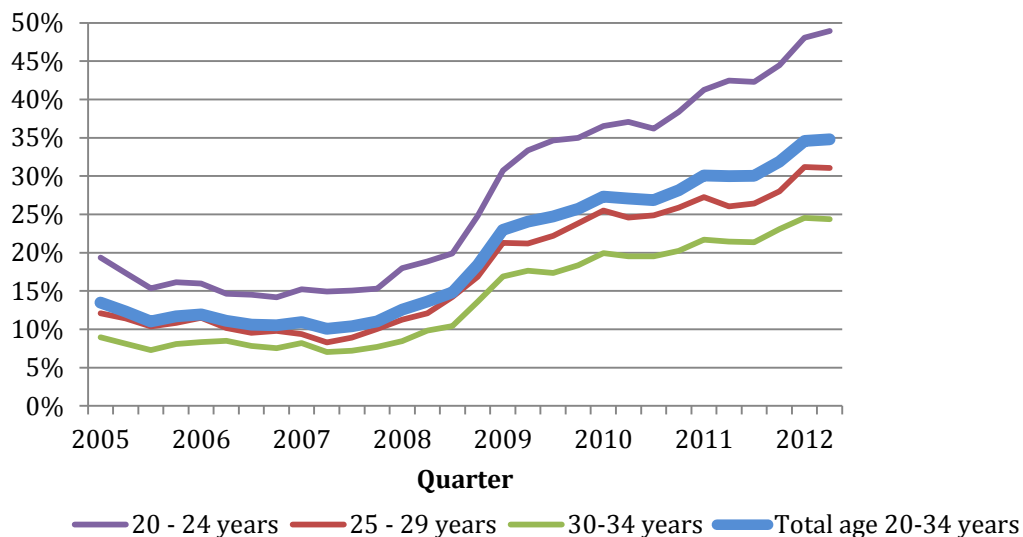
3.5.2 Demographics

A fundamental element of the demand for housing is demographics (Poterba, 1984). According to Jacobsen and Naug (2004), demographics such as total population size, population movements and the number of individuals in the start-up phase are particularly important.

Total population

The total population of Spain has had a steady yearly increase of between 0.88 % and 2.12 % going from 1998 to 2008, while in 2009 and 2010 a growth of respectively 0.59 % and 0.36 % was observed.

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[76] INE (2012f)

Figure 26: Total population (millions) May 1998-January 2011.[77]
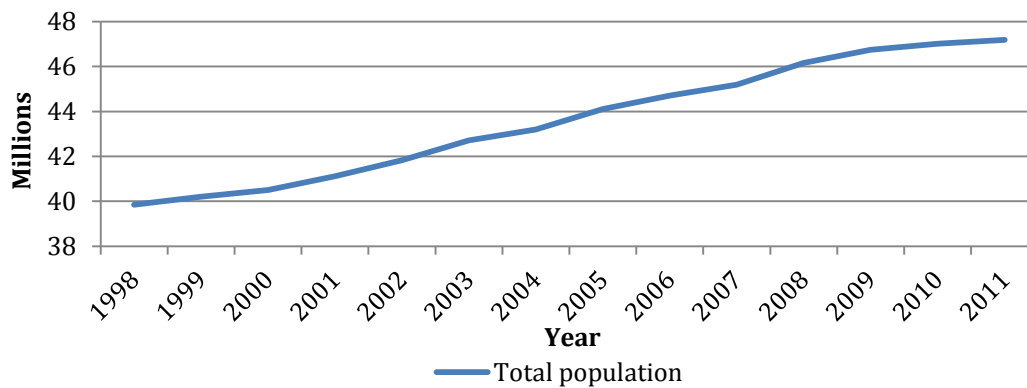
Immigrants

Immigration to Spain increased significantly after 1999. Figure 27 exhibits the development in the population growth in Spaniards and immigrants in the period from 1998 to 2010.

Figure 27: Population growth divided between Spaniards and immigrants (thousands) 1999-2010.[78]
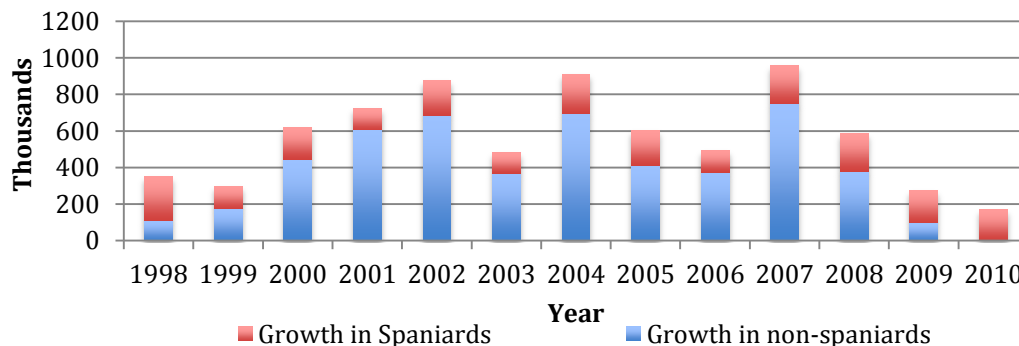
It is the period from 2000 to 2008 that sticks out with a growth in non-Spaniards near or above 400 000 every year. The highest number was in 2007 with approximately 750 000 people. During the rest of the period, 1998-1999 and 2009-2010, the growth in immigrants varied from around 110 000 in 1998 to nearly 0 in 2010.

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[77] INE (2012g). The numbers are from January apart from 1998, which is from May. Numbers from 1997 are not available in INE, because of an estimation error.

[78] INE (2012h) The graph shows the development the population from January to January each year apart from the growth in 1998, which is from May 1998 to January 1999.

Number of individuals in the start-up phase

García-Montalvo (2003) points out that the demand for housing depends on the size of the population in the start-up phase. He defines this group as individuals in the age group 20-34 years. Figure 28 shows the total number of individuals in this age group divided into Spaniards and foreigners. The graph illustrates a total increase of approximately 9 %, going from approximately 9.8 millions in 1998 to the peak in 2007, of 10.7 millions. From 2007 to 2010, however, there was a decline in the number of individuals in this age group of 5.66 %, ending up at 9.87 millions in 2010. Figure 28 also shows that the number of Spaniards in this age group is reduced between 2000 and 2011, but that foreign immigrants in the same age group represent an increasing share towards 2011.

Figure 28: Population in the age group 20-34 by Spaniards and foreigners (millions) 1998-2011.[79]
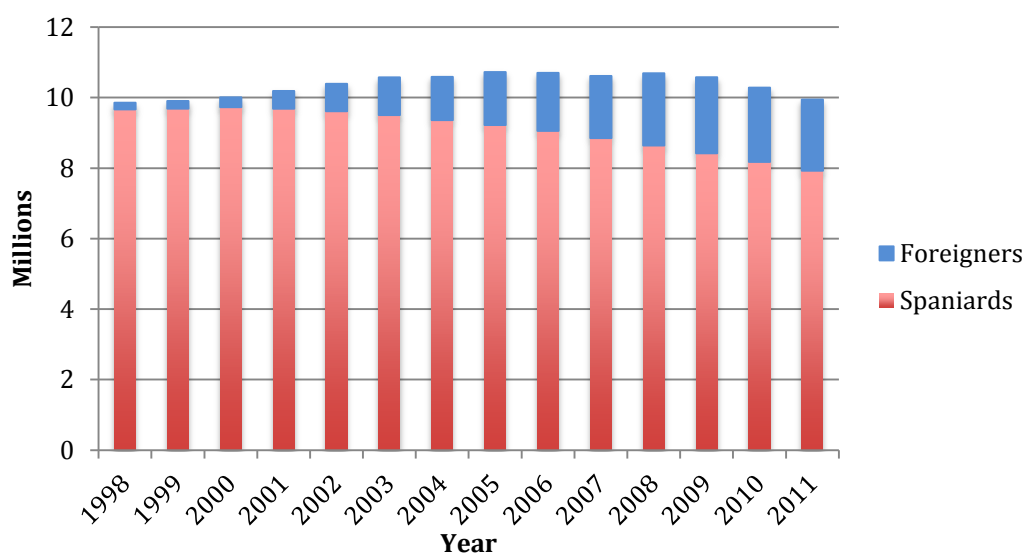
3.5.3 The user cost

The three main determinants of the user cost associated with owning a house in Spain, defined by García-Montalvo (2003) are the interest rate, the tax deduction rate and the expectations about house prices in the future. In this chapter we also present a measure of the ability of Spanish households to take on a mortgage.

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[79] INE (2012i)

Interest rate

Around 95 % of Spanish mortgages are taken out at a variable interest rate based on the EURIBOR and the IRPF (García-Montalvo, 2003). The EURIBOR is calculated by the European Banking Federation on the basis of data from European banks on the average spot interest rate associated with one-year deposit transactions in euros (Banco de España, 2012b). After joining the EMU, the EURIBOR replaced the Spanish MIBOR. The IRPF is the average monthly interest rate for mortgage loans extended by banks and savings banks. The SECA is the monthly average interest rate for mortgages and personal loans extended by saving banks (Cajas).

Figure 29: Nominal interest rates (%) 1991-2012. [80]
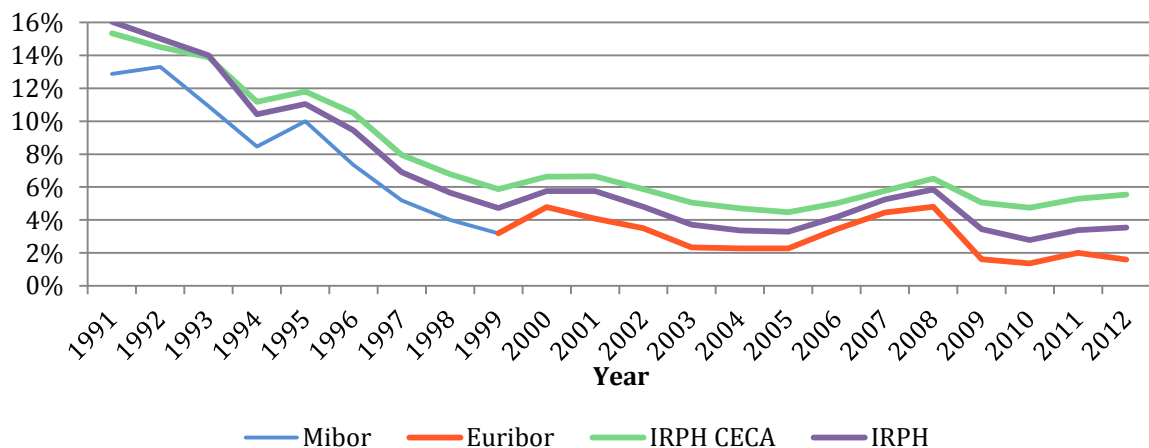
Figure 29 shows the development in the nominal interest rates between 1991 and 2012. The interest rates were reduced from between 13 % and 16 % to between 4 % and 6 % from 1991 to 1999. They remained at low levels until 2012, with minor peaks in 2001 and 2008.

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[80] Datos Macro (2012a)

Real interest rates

Figure 30: Real interest rates (%) 1991-2011.[81]
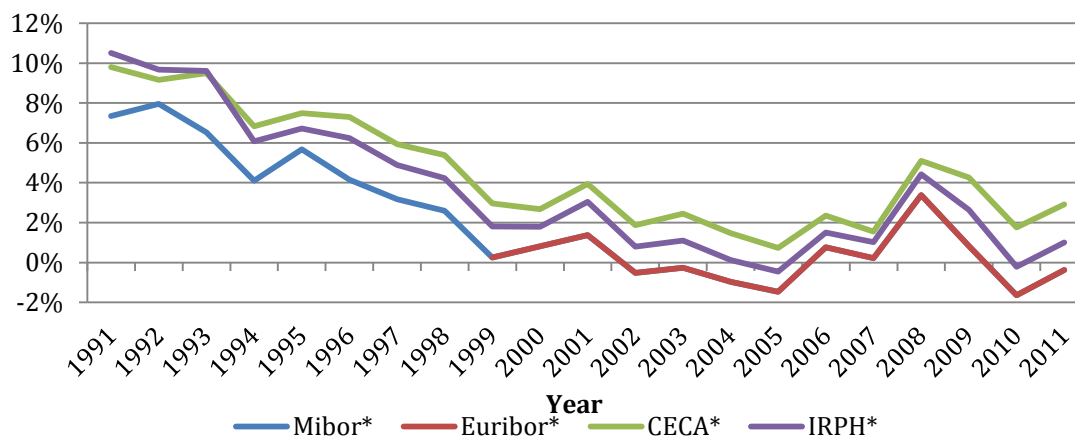
Looking at real interest rates, discounting for actual inflation, one can see from figure 30 that real interest rates went down towards 2005, to very low levels of between 1 % and -1 %. From 2005 onwards the real interest rates rose to between 3 % and 5 %, before dropping again after 2008.

Tax deduction

The deduction rate in Spain has stayed at 15 % ever since its introduction in 1978. However, the deduction base was subject to major changes in 1998.[82] In 1998 an upper limit of the annual deduction base was established at 1 500 000 pesetas (9 015 euros) and mortgage interest costs were included in the deduction base (Fuenmayor and Granell, 2010). This new legislation favored the ones lending money for house purchases. The deduction rate for mortgage installments was increased to 25 % the two first years and 20 % thereafter calculated from a maximum annual deduction base of 750 000 pesetas (4 507 euros). The remaining private equity would be deducted by 15 % until the upper limit of the deduction base of 1 500 000 pesetas (9 015 euros) had been reached (Fuenmayor and Granell, 2010). Figure 31 clearly shows the effect of the new legislation; the average deduction spiked from 369 euros to 776 euros by from 1998 to 1999. From 1999 to 1996 the number of people

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[81] Datos macro (2012a) and Inflation.eu (2012)
[82] Law 40/1998 (art 36,1) and Law 35/2006 (arts 67 68 and 69)

deducting house purchases from their taxes increased by 64 %, with an average annual growth rate of 7.3%. This is illustrated in appendix 1.

Figure 31: Average tax deduction (euros) 1983-2010.[83]
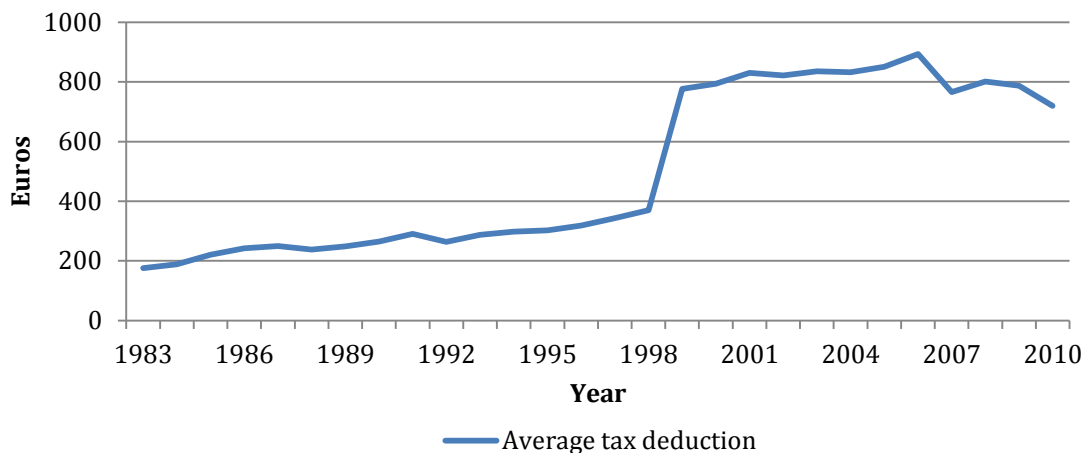
This legislation remained unchanged until the introduction of The Law of a Sustainable Economy in 2006.[84] The deduction rate on mortgage installments was now reestablished at 15 % and a minimum income requirement of 24 107.20 euros is to determine whether tax deductions for house purchase will be granted at all (Fuenmayor and Granell, 2010). For those eligible for tax deduction, the deduction rate decreases with income (Fuenmayor and Granell, 2010). Figure 31 shows that the average deduction was reduced from 900 euros to 720 euros between 2006 and 2010. The number of people deducting house purchases from their taxes reduced was by an average of 2.5 % annually (BADESPE, 2012). See appendix 1 for an illustration.

Expectations

Another determinant of the user cost is the expectations about house prices in the future. We found no specific data on house price expectations for Spain. The consumer confidence index might serve as a proxy. Consumer confidence can be defined as the degree of optimism of consumers about the overall state of the economy and their personal financial situation (Trading Economics, 2012). A consumer confidence of a 100 demonstrates maximum optimism, 0 refers to maximum pessimism and 50 represents neutrality. High levels indicate

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[83] BADESPE (2012)
[84] Law 35/2006 (arts. 67 and 79). (Tax legislation)

that consumers make more purchases, boosting the economic expansion, whereas lower levels indicate higher saving rates, prompting a contraction in the economy (Trading Economics, 2012). The Spanish consumer confidence index had high levels between 80 and 97 from 2004 towards the end of 2007. In 2007, however, the index dropped to 50 from September 2008 to April 2009. In 2010 and 2011 the index recovered somewhat before dropping again in 2012.[85] A graphic illustration of the consumer confidence index between 2004 and 2012 of Spain is shown in appendix 2.

Household ability to take on a mortgage

Banco de España and INE use an indicator called "Theoretical Effort for House Purchase" ("Esfuerzo Teórico para la Adquisición de Vivienda"). This is an indicator of household ability to take on a mortgage and is based on the mortgage cost relative to household disposable income (Banco de España, 2012c). More specifically the indicator represents the gross mortgage installments during the first year, financed with a standard loan with an LTV of 80 %, as a percentage of average disposable income of Spanish households (Banco de España, 2012c). Figure 32 demonstrates that mortgage costs represented a high share of household income in 1995 of between 37 % and 48 %. The share decreased towards 1999 to between 20 % and 30 % of household income, before rising to between 40 % and 50 % in 2008. Despite a decline in disposable income from 2008 to 2009, the share of mortgage costs dropped dramatically to between 27 % and 34 % in only one year, because of the decline in house prices. Figure 32 also demonstrates that the effect of reduced tax deductions. The difference in affordability with and without tax deductions is smaller after 2009.

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[85] "ICC has been carried out by the Official Credit Institute (Instituto de Crédito Oficial) between 2004 and 2011. From November 2011 ICC is conducted by the Center of Sociological Research (el Centro de Investigaciones Sociológicas). The indicator is based on a monthly telephone survey carried out by IPSOS Spain on a sample of 1,000 people aged over 16 who are representative of Spanish society as a whole." (Trading Economics 2012).

Figure 32: Household ability: mortgage cost relative to household income (%) 1995-2012 second quarter. [86]
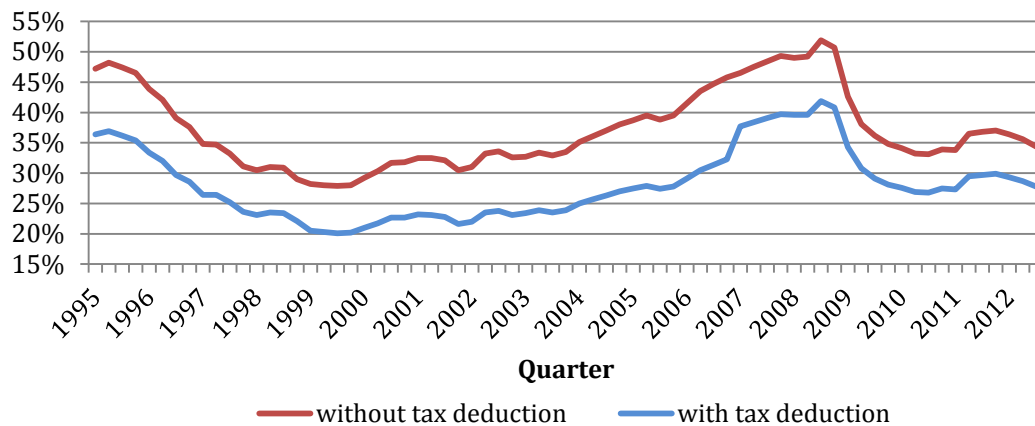
Rental costs

The framework of Poterba (1984) points out the rental cost as a measure of the value of owning: what you would have had to pay if you rented your house rather than owning it. A more precise measure of this value of owning, referred to as the imputed rent, is collected in most countries. Unfortunately all data on this indicator from before 2006 have been removed from the webpage of the National Institute of Statistics (INE) and the validity of the data from 2006 have been questioned.

Figure 33: Index of the average real rental cost (2001 = 100) (2002-2006).[87]

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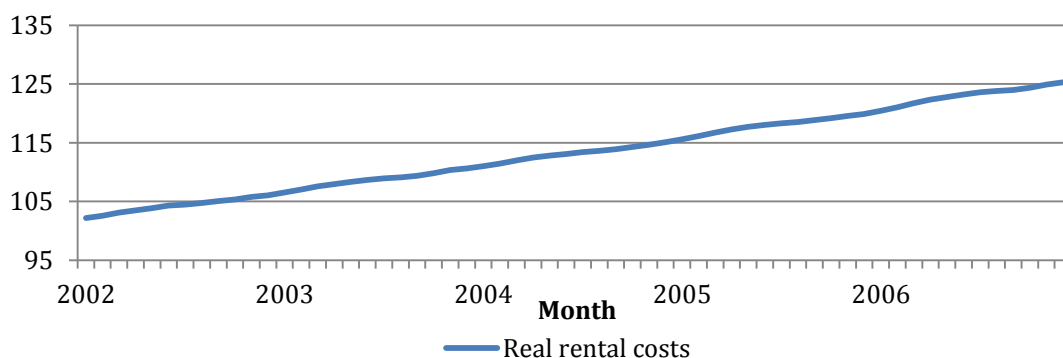
[86] Datos Macro (2012b) Datos Macro (2012c)
[87] INE (2011). The numbers from 2001 was not available.

Figure 33 shows the development in the real average rental cost in Spain from 2002 to 2006. The graph illustrates an increase of around 25%. The data of INE (2011) on the rental cost after 2006 are based on a different methodology than the one used from 2002 to 2006, however rents continued to grow and increased by 32 % between 2006 and 2011. Given that the data are compatible the average annual increase in rents was approximately 5 % between 2002 and 2011.

3.5.4 Credit development

Existing literature imply that the availability of credit affects house prices. In this chapter the development of credit is presented together with some characteristics of Spanish mortgages.

The principal share of household debt in Spain is represented by mortgages or loans to finance a house purchase, and with lower interest rates after entering the EMU, access to credit became easier for most Spaniards.[88] Figure 34 shows the development in total household debt as a percentage of GDP from 2000 to 2011, and lending for house purchase as a percentage of GDP from 1995 to 2011. Both are based on current prices (OECD statistics, 2012b; AHE, 2012; WDI, 2012c). From 1995 to 2009 there has been a tremendous growth in lending for house purchase, going from constituting 15.6 % of total GDP in 1995 to almost 64.7 % in 2010. The high correlation between total debt and lending for house purchase demonstrates that lending for house purchase can explain most of the increase in total household debt from 2001 until 2011. The difference between the two indicators lies between 16.7 percentage points and 21.4 percentage points, with the maximum gap being in 2009.

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[88] See chapter 3.5.3 about interest rates

Figure 34: Total household debt and lending outstanding for house purchase (% of GDP) 1995-2011.[89]
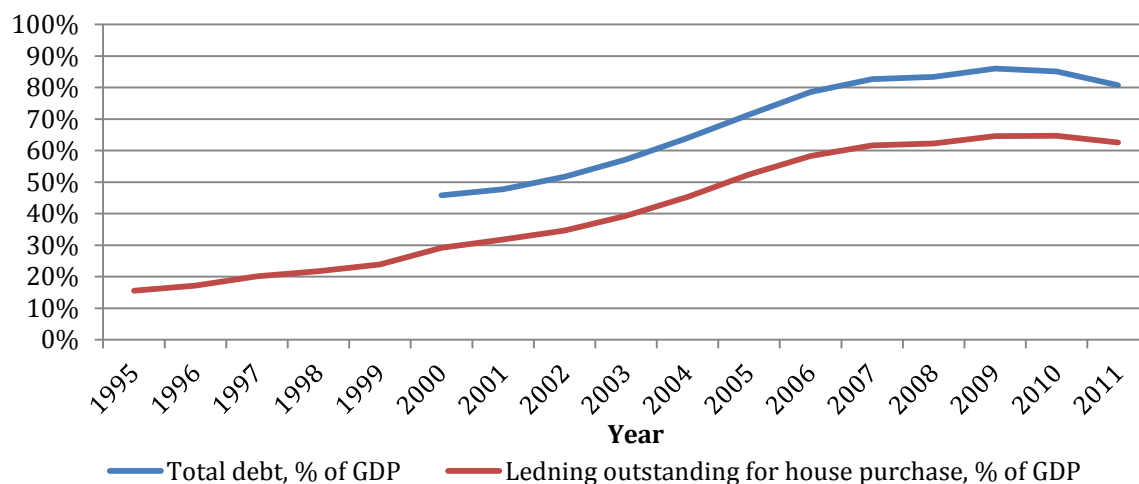
Since 2000, the growth rate in household lending to GDP has been higher in Spain than in many other European countries. This is illustrated in figure 35. The index value for Spain nearly doubled from 2000 to 2006. On the contrary, Germany hardly experienced any changes apart from a small decline in growth in household debt to GDP was seen after 2006.

Figure 35: Growth in household lending for house purchase to GDP (index) (2000 = 100) 2000 - 2012.[90]
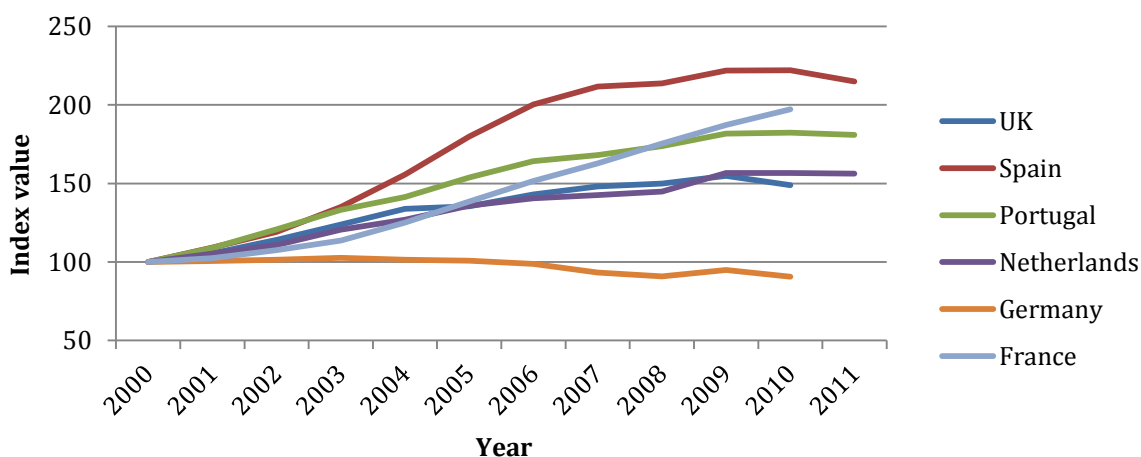
The development in the total amount and number of mortgages for dwellings issued each year from 1995 to 2011 is presented in figure 36. The index is based on nominal numbers with reference year in 2003. The data include both private and commercial mortgages. [91]

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[89] OECD statistics (2012b), AHE (2012) and WDI (2012c)
[90] OECD (2012c). 2011 values are not obtained for UK, Germany and France.

Figure 36: Number and nominal amount of mortgages issued yearly (index) (2003 = 100) 1995-2010.[92]
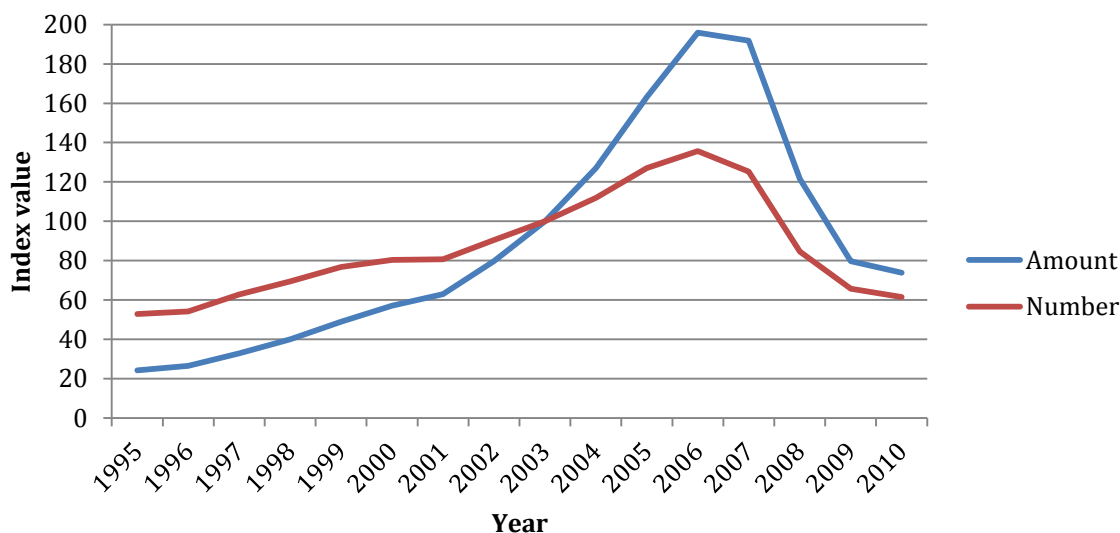
From 1995 to 2003, the number of mortgages issued doubled, and the total amount issued for mortgages nearly tripled. This indicates that the average amount issued per loan increased significantly towards 2006. Both continued to grow even more towards the peak in 2006. Looking at the development from 2003 until 2006, the total amount issued nearly doubled in only four years growing with 95.8 %. The number of mortgages issued also peaked in 2006, having increased by 35.6 % from 2003. After 2006, both the number and amount started to shrink. From 2007 to 2009, 47.5% less mortgages was issued and the amount decreased by 58.4%

Breaking down total mortgages allows us to look at different types of investments. In the figures 37 and 38 mortgage types are divided into two main categories: The first type is categorized as "Urban land", which includes "dwellings" and "other".[93] The second type is categorized as "Agricultural land" referring to farmland.[94]

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[91] The data are collected from Ministry of Infrastructure (Ministerio de Fomento), which changed its base in 2003. Both bases include year 2003, however the data from the different bases vary. Thus, the data from 1995 to 2003 and 2003 to 2011 are not comparable in absolute terms. To express an illusion of the development, an index is created with reference year 2003 in each base, then the index is merged together.

[92] INE (2012j)

[93] "Other purposes" refers to undefined land, commercial premises, garages etc. For better specification, see INE (2012l).

[94] The amount and number of mortgages issued for agricultural dwellings, which are included in agricultural land, are not obtained and therefore not presented as part of the mortgages for dwellings.

Figure 37 shows the number of mortgages issued while figure 38 displays the total nominal amount of mortgages, both in quarterly terms and in the period from 2003 to the second quarter of 2011.

Figure 37: Number of mortgages issued (thousands) 2003-2011 second quarter. [95]
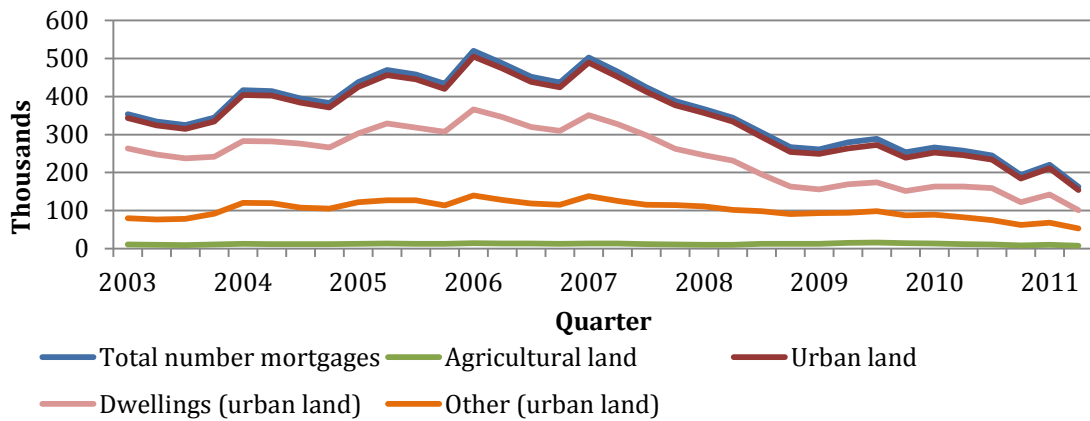
Figure 38: Total amount of mortgages issued (billion euros) 2003-2011 second quarter. [96]
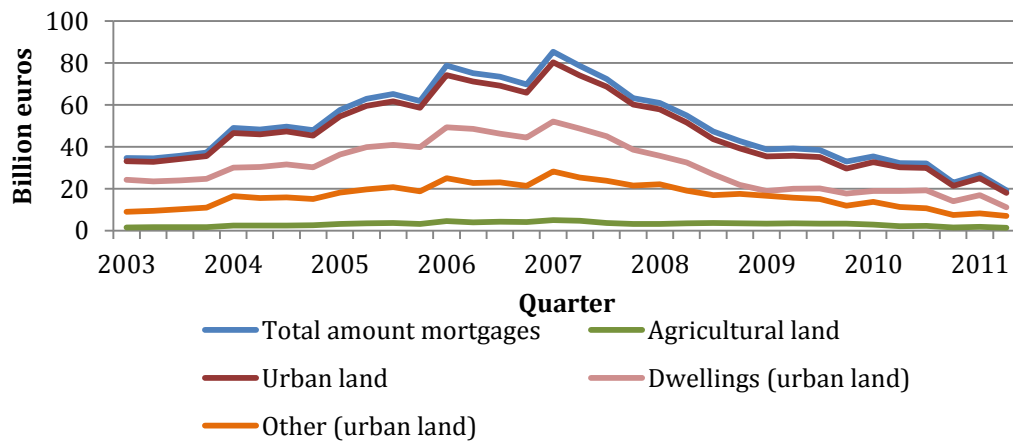
The share of mortgages issued to urban land out of the total number of mortgages varies between 94 % and 97 %, while the amount issued to urban land of the total amount varies from 89.8 % to 95.2 %. Consequently, the amount of agricultural mortgages increased relatively more than the amount of mortgages to urban land.

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[95] INE (2012j)
[96] INE (2012j)

Looking at mortgages for dwellings separately, the year- on- year growth rate in the number issued from the first quarter of 2005 to the first quarter of 2006 was 20.7 %. In the same period the total amount increased by 35.7 %. In the first quarter of 2006 the total number of mortgages issued was 366 094, worth nearly 49.3 billions.

The high growth rates altered during 2006 when the growth in numbers of mortgages was -4.1 %, and the total amount of mortgages for dwellings only grew 5.8 % from the first quarter of 2006 to the first quarter of 2007. From 2007 to the first quarter of 2008, both the growth rate in number and the total amount dropped with approximately 30 % each, while the following year they dropped 36.9 % and 47.0 % respectively. From 2009 to 2011, the reduction has not happened as rapidly.

Credit institutions

There are mainly three types of institutions that issue mortgages in Spain. In September 2011, the market share of outstanding mortgages issued by the different banks were 38 % for commercial banks, 54 % for savings banks and 7 % for cooperative banks (EMF, 2012). In addition there are other credit institutions with a total of 2 % of mortgage remaining market share. The figures 39 and 40 show the development for the different credit institutions in the number and amount of the total mortgages issued from 2003 to the second quarter of 2011. All types of mortgages are included, not only mortgages issued to households.

Figure 39: Number of mortgage issued by different credit institutions (thousands) 2003-2011 second quarter. [97]

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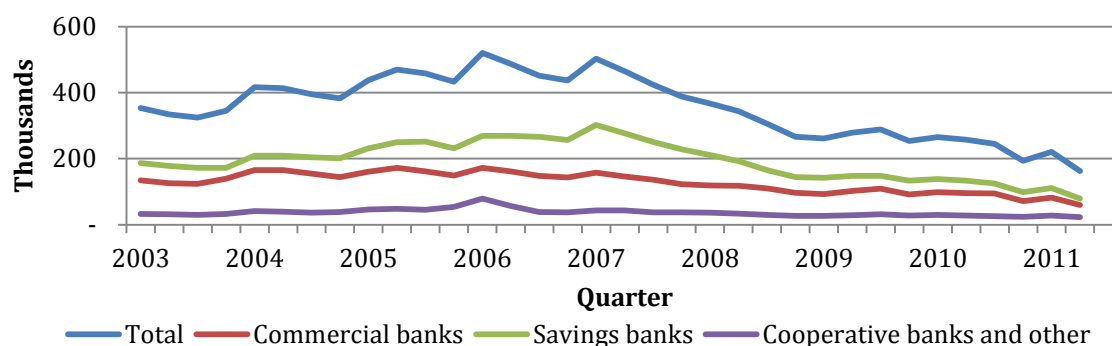
[97] INE (2012k)

Figure 40: Total amount of mortgage issued by different credit institutions (billion euros) 2003-2011 second quarter. [98]
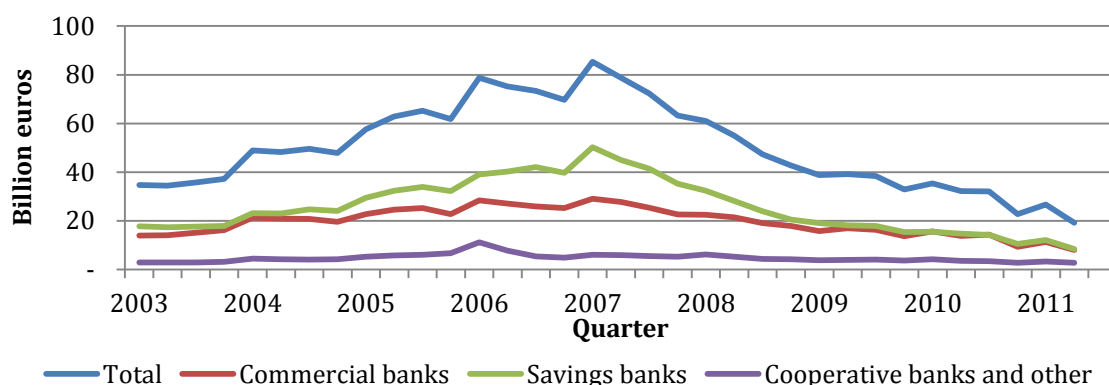
As the figures above show, the savings banks have had the biggest market share throughout the period with the highest number of mortgages issued, reaching its peak in the first quarter of 2007 with 302 226 numbers of loans issued worth approximately 50.2 billon euros. From the first quarter of 2003 to the first of 2006, the number of loans from all the institutions rose; commercial banks 28.5 %, savings banks 43.7 %, and cooperative banks and other credit institutions 142.1 %. The corresponding amount in the same period was an increase of 103.9 %, 119.4 % and 286.1 % respectively. During the following year, the growth rate in the number issued from the first quarter of 2006 to the first quarter of 2007 increased for commercial banks, cooperative banks and other credit institutions. On the contrary, savings banks issued 12.4 % more in 2007 compared to the first quarter of 2006. After the peak in 2007, for savings banks, the lending channel was tightened significantly, reducing numbers of loans issued by 52.9 % and the volume by 62.1 % in two years, from the first quarter of 2007 to the first quarter of 2009. In the same period, "commercial banks" and "cooperative banks and other" reduced the number issued by approximately 40 % each, and the amounts by 45.5 % and 36.5 % respectively. Only cooperative and other institutions were the ones not reducing the size of the loans with a higher percentage than the number of mortgages issued. Apart from a small quarterly increase from the last quarter of 2009 to the first quarter of 2010 and from the last quarter of 2010 to the first quarter of 2011, both the number of mortgages and amount issued have dropped from the beginning of 2009 until the second quarter of 2011.

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[98] INE (2012k)

Mortgage characteristics

The interest conditions in Spain vary, with variable interest rate being the most common nowadays. In 1997 the percentage of mortgages outstanding with variable interest rates was 75.5 % (Maier and Villanueva, 2011), whereas in 2009, this share had increased to 97 %. Towards 2011 the share of mortgages with variable interest rates decreased somewhat towards 2011, when a total of 81.3 % of the residential mortgages issued were in the same category (EMF, 2012).

As of September 2010 the government of Spain did not have a maximum LTV ratio (Crowe, 2011), so the government did not restrict lending. To our knowledge, this is also the case in 2012. The average LTV ratio on loans issued in 2010 was 57.4 %. In the same year, only 11.9 % of total loans were granted with an LTV above 80 % and the average LTV ratio on the residential mortgage portfolio was 62 % (EMF, 2012).

Figure 41 displays the development in the loan to value ratio from 1995 to 2011. The explanation of "first time buyers" is loans granted to people who are new in the housing market, "replacement" refers to buyers who are already in the market, whereas the average is based on an average based on the two mentioned categories in addition to loan for a second house. [99]

Figure 41: Loan to value ratio (%) 1995-2011. [100]

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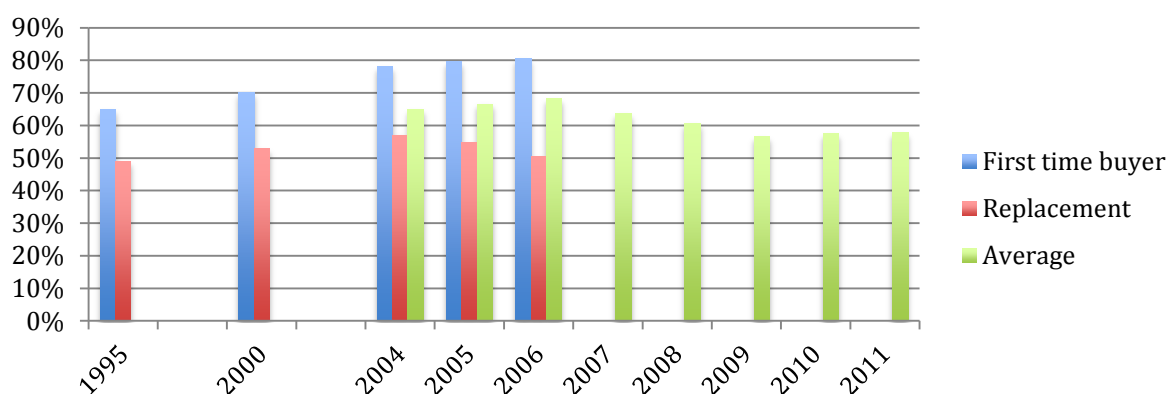
[99] Data for first time buyer and replacement were not obtained from 2007 onwards.
[100] * Incomplete time series, Gómez (2007), Ministerio de Fomento (2012j)

The LTV ratio for first time buyers increased approximately 15 percentage points from 1995 to 2006, whereas for people already in the market, the rate increased from 1995 to 2004, before decreasing in 2005 and 2006. There was a slight increase in the average LTV rate from 2004 to 2006, going from 65 % to 68 %, before declining and stabilizing around 55 % in 2009.

According to Masier and Villanueva (2011) the average maturity of residential mortgages in the beginning of the 1990s was about 15 years. Between 1996 and 2005 average maturity increased from 18 to 25 years.

4 Analysis and discussion

House prices in Spain have had a dramatic development between 1997 and 2012, with an impressive growth towards 2008 and a subsequent fall towards 2012. In the second quarter of 2012, the prices were back to their 2004-levels. With 85 % of the housing stock owned by its occupants, high levels of credit for house purchase, and 12 % of the working population in the construction sector, the price fall after 2008 has caused dramatic consequences for the Spanish population. A frequently asked question in Spain is "For how long will the prices continue to go down, and what has caused this dramatic development?" In the following chapters we will try to answer the latter question in an attempt to highlight the main drivers of house prices between 1997 and 2012.

Based on the theoretical framework provided by Poterba (1984), we analyze the effect of the drivers of supply and demand on house prices in Spain. We will not consider regional differences, as the overall development has been somewhat similar in all regions. The data provided in the previous chapter suggest that some variables, which have not been taken into account in the framework of Poterba (1984), might have been significant. We will therefore also look into some of the characteristics of the housing stock, such as a low rental share and high shares of non-residential houses. Drawing on the work of García-Montalvo (2010) and BBVA (2010) we will also look into the effect of the availability and price of land on house prices. There is high consensus regarding the fact that Spain suffered from a speculative bubble towards 2008, before the bubble burst and led to a fall in prices towards 2012. This suggests that expectations about future house prices have been important. Poterba (1984) describes the mechanism of expectations affecting house prices, but he assumes that the actors in the housing market have rational expectations and a perfect foresight about the future path of the economy. We therefore draw on the work of Shiller (2007), Piazzesi and Schneider (2009) and García-Montalvo (1984) in analyzing the effect of irrational expectations on house prices. Spain has experienced high credit growth since 2000, and based on the ideas of Anundsen and Jansen (2011), we analyze whether Spain has experienced a self-reinforcing effect between credit growth and house prices.

In the analysis we first consider drivers of supply and demand separately. Each chapter begins with a short summary of the development in the specific driver analyzed between 1997 and

2012, before discussing what the effect of this development should be based the theoretical framework. If the driver is not included in the framework, additional theories explaining this driver are used. Further we draw on other findings about the effect of the drivers, based on available literature written specifically about Spain, and in some cases empirical studies from other countries. This will provide the necessary overview to highlight the importance of each driver on the price development.

Finally, based on our knowledge about the effect of different drivers on house prices, we discuss the policy implications of our findings and consider the role of the government.

4.1 Drivers of supply

The data provided in the previous chapters describe some interesting characteristics of the Spanish housing stock, such as high shares of non-residential houses and a low rental share. We therefore look into whether these characteristics have contributed to the strong development in house prices towards 2008. The data also imply that the availability of land increased significantly after the liberalization of land regulation in 1997, and the effect of this is therefore be analyzed.

One of the peculiarities in the Spanish housing market between 1997 and 2007 is a strong positive development in house prices, while the level of new construction was higher than ever before. Construction was significantly reduced as of 2007, and prices fell dramatically after 2008. In this chapter we also look into what this high level of construction might imply for house prices and discuss whether rising construction costs may have contributed to the rise in prices towards 2007.

4.1.1 Characteristics of the Spanish housing stock

In this chapter the focus is on whether any of these characteristics could have had an effect on the price development between 1997 and 2012. Our data on the Spanish housing stock presented in chapter 3.4.1, demonstrate that the share of secondary housing remained relatively stable from 2001 to 2011 at between 30 % and 33 %. Secondary houses consist of

vacation houses and unoccupied houses. The rate of unoccupied houses has represented between 16 % and 13 % of the housing stock since 1981, while the share of vacation houses increased significantly between 1981 and 1991. This share has remained relatively stable ever since. A high share of secondary housing might have an effect on the general house price level in Spain. Nonetheless, since the share has remained relatively stable since 1991, it is likely that this was not one of the important drivers of the price development between 1997 and 2012. The rental share, however, has decreased significantly the last 50 years. The rental share of primary dwellings was approximately 43% in 1960 and decreased every decade to approximately 13 % in 2000. Data from 2001 to 2005 are not available, but according to INE (2012c), the rental share remained at approximately 13 % in 2006 and 2007 before increasing steadily to 16 % in 2010.

Some of the reasons for this low supply of rental houses might be dated back to the legislation introduced during Franco´s regime. He imposed great disadvantages for tenants and created policies, and also a mentality favoring people who owned their own homes. The liberalization of these laws, in 1985 and 1994 did not seem to increase the rental share, but rents, which were no longer bound by government restriction, increased. Our data on the real rental price between 2002 and 2006 show a steady increase of 20 % with an average annual growth rate of 4.5 %.

According to Poterba's (1984) framework the value of owning a house is described as the cost one would have had to pay if renting the house, rather than owning it (R). This value is determined in the property market – the market for real estate consumption, in which the rental market is a part (together with the market for owner-occupied houses). See figure 2 in chapter 2 for an illustration of the housing market. The rental market can have two effects on house prices: If the supply of rental houses is particularly low, this could imply higher rents for tenants, thus increasing the value of owning. Consequently, higher demand for owner-occupied housing, caused by higher rental costs, could push up the house prices. Alternatively, if the supply of rental housing is very low, the demand for owner-occupied housing might increase at a higher pace than if the supply of rentals were higher. This is because renting might not be an easily accessible alternative to owning. Both effects will contribute to increase house prices.

One way of examining these two hypotheses could be done by finding reliable data on the value of owning a house, which has been described in the literature as the imputed rent (See Ozanne, 2012). Most countries have data on this indicator. Studying the correlation between imputed rent and rental costs could give an understanding of the attractiveness of owning compared to renting a house. This could give a more detailed analysis of how the rental market affects the housing market and whether there is an effect at all. Unfortunately all data on this indicator from before 2006 have been removed from the webpage of the National Institute of Statistics (INE) and the validity of the data from 2006 have been questioned. We have therefore chosen not to include imputed rent in our analysis.

Most of the existing literature on rental costs and house prices consider the price to rent ratio in order to determine a potential overvaluation of house prices. However, there are few studies, to our knowledge, that consider how rental prices and a low rental share can influence house price developments. García-Montalvo (2010) studies the determinants of growth in house prices at the municipal level in the regions of Madrid and Barcelona from 2001 until 2005. Several variables are included in the regression; variables indicating land use regulation, population, immigration, employment and the rental share. The results implied that only the variable indicating the rental share showed a statistically significant effect on house prices. When including this variable, the goodness of fit increased significantly and the parameter is statistically significant at a 10 % level. This result indicates that a higher rental share (larger rental market) will have a negative effect on the house price development. However, when including a last variable indicating the initial house price level in 2001, only this parameter is statistically significant. Furthermore, the goodness of fit is higher than in the previous regression. This result suggests that house prices have grown faster in municipalities where the initial house prices were lower, and that this effect overshadowed the one of the rental share on house prices.

Let us first consider the first hypothesis which suggested increased rents caused by a small supply of rental houses could have had an effect on house prices in Spain. The rents increased steadily at an average rate of 5 % between 2002 and 2006, so they might be able to explain some of the increase in house prices. Nonetheless, the question of causality arises: Did higher rents cause house prices to go up, or were rental costs driven up by increased house prices? Given that the rental market is very small compared to the housing market, it is not likely that rents were an important driver of house prices.

Let us consider the second hypothesis, which suggests that a small supply of rental houses increases the house price due to reduced possibility to choose other arrangements than owner-occupancy. The rental share was reduced significantly towards 2000, but this reduction could have been driven more by demand factors: If a latent demand for rental houses existed, limited by a small supply of rental houses, the rental share after the liberalization of the rental laws in 1985 should have increased instead of declining. The mentality created during Franco's dictatorship might still have been present, impeding the increase in both demand and supply of rental houses. Nonetheless, whether the reduction in rental houses was driven by supply or demand, it is likely that it had an effect on house prices.

However, only one study by García-Montalvo (2010), with inconclusive results regarding the effect of the rental share on house prices, is not enough to determine that this effect exists. In the case of Spain, we can therefore not disregard the possibility of a decreasing rental share being a driver of the house price development between 1997 and 2008, but we cannot measure the effect nor even determine that the effect exists.

The rental share increased after 2006, as house prices declined, however, we do not have enough information to determine whether this contributed to the reduction in house prices, or whether the rental share increased because of declining house prices.

4.1.2 New construction

As previously mentioned, both a strong growth in the house prices as well as increased supply of new houses were seen from 1997. The data in chapter 3.4.2 show that the construction of new houses was reduced in 2007, before the fall in prices. In this chapter we look into what the level of new construction should imply for house prices and discuss whether construction costs can have contributed to the house price development in the period analyzed.

From 1997 to 2005 house prices increased significantly more than construction costs. However, the growth in house prices and construction costs from 2005 to 2008 were strongly correlated. The gap between the growth in house prices and construction costs then grew bigger as the house prices fell while costs remained relatively stable throughout the period.

The number of initiated and completed houses peaked in 2006 before declining, while the number of unsold houses peaked in 2009, having increased dramatically from 2004.

Considering the model of Poterba (1984), the supply of new houses provided by the construction industry depends on house prices relative to the construction cost. If the market value of the house is higher than the replacement cost, investment in housing is profitable. Construction in the short run is considered fixed, thus the housing stock is also fixed in the short run. The isolated effect of an increase in the new construction will cause an outward shift in the supply curve, decreasing the house price. Consumers will respond by increasing demand and gradually a new long-term equilibrium, with higher supply and prices, will be reached. The isolated effect of rising construction costs will reduce the profitability of new construction. This will cause an inward shift in the supply curve reducing new construction and increasing house prices.

García-Montalvo (2008) estimated the demand for housing in the period from 2000 to 2007 to an average of between 350 000 and 400 000 houses each year. The corresponding construction in the same period was approximately 625 000 new houses each year. An oversupply in the housing stock was created every year.

Firstly, we consider the relationship between house prices and construction costs. According to Moro and Nuño (2011), house prices more than doubled between 1997 and 2007[101], whereas construction costs grew only by 40 %. This can explain some of the surge in new construction towards 2007 given that new construction became increasingly profitable towards 2007. Moro and Nuño (2011) did an empirical analysis on the US, UK, Spain and Germany studying whether differences in total factor productivity (TFP) in the construction sector relative to the rest of the economy could have an effect on construction costs, and to what extent this would affect house prices. If the TFP in the construction sector grows more slowly than in the overall economy, the relative cost of construction is assumed to go up. They found that the rise in construction costs in Spain and the UK is not due to differences in TFP and that construction costs account for a small part of the surge in house prices.

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[101] Moro and Nuño (2011) use data from Ministerio de Vivienda (Ministry of Housing) and therefore obtain another increase in the house prices than what the data we obtained from Ministerio de Fomento (Ministry of Infrastructure) display. The data of Ministerio de Fomento show that house prices tripled between 1997 and 2007.

Normally, the construction costs have to be paid before the housing structure is completed. Keeping this in mind, the constructors must believe that the sales price will be higher than the costs when they initiate the house project. Assuming a lag of approximately two years between the start of constructing and the sale, projects launched by 2006 were profitable, and projects initiated in 2007 or later were an affliction for the contractors as house prices dropped severely from 2008. The number of initiated houses in 2007 was reduced after the peak in 2006, which could implicate that the market predicted a reduction in house prices after 2008 already in the beginning of 2007. One must keep in mind that some of the houses are sold before construction is finished and that the cost index does not include land prices.

When considering the supply of new houses, we see that from 2004 an oversupply was created as the number of unsold houses increased. This should lead to a reduction in house prices, however, this was not the case. Two factors could explain this. There could have been irrationally high expectations about future house prices, or imbalances in the market. A combination of the two factors is also possible. The market imbalances refer to an oversupply of new construction in regions where demand is not high, or a supply of houses not responding to the type of demand present. An example could be the supply of secondary housing or vacation houses where there is a demand for dwellings. This market failure implies that construction of new houses not has been a significant driver of the prices since an increase in new construction should have reduced the house prices. Considering that construction costs continued to rise after the fall in house prices in 2008 suggests that the assumption of Moro and Nuño (2011) about the construction costs not being an important driver of house prices is correct.

As the number of unsold houses increased, a quick decline in the initiation of new construction was observed due to a strong reduction in demand starting in 2007. The change happened quickly with prices dropping more rapidly from 2008 than the increase prior to this year. This indicates that the reduction process of construction is not as time consuming when responding to a reduction in demand as when demand increases. The supply response to a reduction in demand is asymmetric as Corder and Roberts (2008) suggest. Obtaining building permits takes time, but they are permissions, not obligations to construct. Reducing the number of employees is also less time consuming than hiring workers. This makes it easier to cut production more rapidly when demand is sinking. Prices continued to drop towards 2012,

while the construction costs have increased, making it less profitable to construct. This explains to some extent the very abrupt decline in the construction from 2008 to 2009.

In sum, construction costs have not been an important driver of the house price development between 1997 and 2007 and the increased level of production towards 2006 should have reduced house prices. After the bust of the housing market in 2008, the supply of new construction was reduced and the isolated effect of this should have been an increase in prices. This implies a market failure in the Spanish housing market and emphasizes the importance of demand factors both in the surge of house prices towards 2008 as well as the decline towards 2012.

4.1.3 Regulation and the price of land

Land is an important component of a house. Therefore the price of a house should be affected by the price of the land on which it is built. One of the most apparent shortcomings in Poterba's (1984) model is the omission of the cost of land in the output function of the construction sector (Poterba, 1984). In analyzing how the price and regulation of land might have affected the house price development between 1997 and 2012 we will draw the studies of García-Montalvo (2010), Garriga (2010) and BBVA (2010).

The data presented in chapter 3.4 show that the price of land increased at a significantly higher pace than house prices between 1997 and 2007. While the house prices nearly tripled, the price of land increased eightfold. From 2004 the price of land for construction increased from 206 euros per square meter in the first trimester of 2004 to 285 euros in the second trimester of 2007 before dropping to 169 euros in the first trimester of 2011. The price of land increased to around 195 euros towards the second trimester of 2012. This shows us that the price development in the price of land after 2007 has been somewhat correlated with the development in the house prices.

From the presentation of land regulation in chapter 3.2 we know that Spanish land has been divided into three different categories between 1975 and 1998: Rural land, urban land and developable land. The policies since Franco´s regime up until 2007 favored the expansion of urban land and developable land at the expense of rural land. In 1998 this expansion was

intensified when a new law allowed all land, which was not yet urbanized, to be considered designated for building if there were no reasons for preserving it. This is why the supply of developable land increased significantly after 1998. In 2007, however, the government introduced a new law, with stricter regulations, to decrease the supply of land.

García-Montalvo (2010) analyzes the determinants of growth in house prices at the municipal level, examining the regions of Madrid and Barcelona. This is one of the first papers considering the correlation between land use regulation and house prices in Spain. The indicator, measuring land use regulation, is the ratio of developable land over total land, minus "especially protected land" in the two regions. We must keep in mind that this indicator for land use regulation is based on the law introduced in 1998. The results of the regression had counter-intuitive results. Higher supply of land is believed to decrease the price of land and thus reduce house prices. However, the results from the regression in the study of García-Montalvo (2010) indicate that the municipalities with higher supply of land available for construction experienced a higher increase in house prices between 2001 and 2005. Nonetheless, the parameter is not statistically significant.

Garriga (2010) developed a quantitative model to account for the change in the level of house prices in Spain from 1997 to 2007. He considered residential investment, immigration, current account deficits, and the elimination of regulation of land as driving forces behind the housing boom. Garriga (2010) decomposes the contribution of land to house prices both to an increase in the price of land, which tripled, and to an increase in the supply of land, which increased by 28 %. He found that the isolated effect of increased supply was a decline in the price of land of 21 %. This effect, however, was not enough to compensate for the increased price of land caused by higher demand. Consequently the contribution on house prices associated with the liberalization of land regulation was very small.

In another study the BBVA (2010) analyzes the total capital invested in housing between 1997 and 2007. They find that the total value of the housing stock increased by 288 % from 1997 to 2007. 83.9 % of the total increase can be explained by the increase in house prices, and 16.1 % is explained by the expansion of the housing stock. The expansion in the housing stock is expressed in square meters of the total surface of the property, referring to the size and the number of houses.

The increased value of the total housing stock between 1997 and 2007 caused only by prices (83.9%) can be decomposed further into the effect of the price of land and the price of housing structures. Given that the price of land increased at a much higher pace than house prices the BBVA (2010) finds that the surge in house prices between 1997 and 2007 is mostly due to the increased price of land. The BBVA (2010) argues that as much as 83.6 % of the house price development can be attributed to the price of land. The remaining 16.4 % can be explained by the increased price of housing structures. Figure 42 sums up the results of the analysis of BBVA (2010).

Figure 42: Decomposition of the price and surface effect
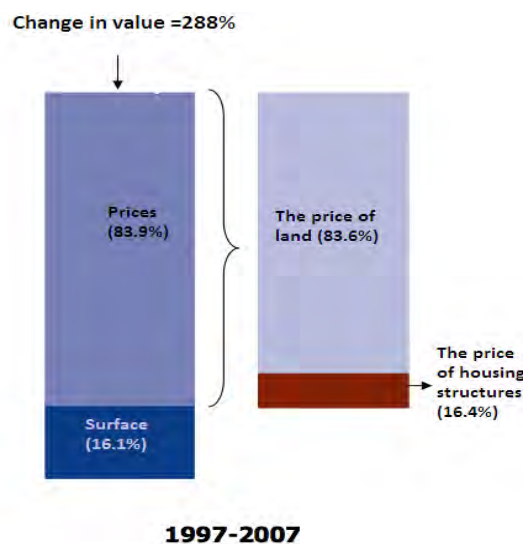
Many Spaniards claim that the price of land is the driver of house prices. However, in a lecture given at the University of Pompeu Fabra García-Montalvo (2007a) argues that this assumption is false. He suggests that the causality is reversed and that increased demand for housing and thus increased house prices has driven the price of land not vice versa.

The deregulation of land after 1998 increased the supply of land and might explain the sharp increase in the construction of new houses. Garriga (2010) finds that the isolated effect of increased supply should reduce the price of land by 21%. However, because of the simultaneous increase in both supply and demand, the overall effect on land prices is found to be small. BBVA (2010) finds that most of the increase in house prices is associated with the increase in the price of land. However, we cannot determine whether the price of land is a

driver of house prices or whether the assumption of reversed causality between house price and land, suggested by García-Montalvo (2007a), is correct.

4.2 Drivers of demand

The demand for housing was particularly high from 1997 to 2007, while the dramatic fall in residential real estate transactions fell dramatically after 2007 towards 2012. Demographics and income growth are important drivers of housing demand. We therefore analyze the effect of these on the house price development between 1997 and 2012. The changes in tax subsidies together with low real interest rates seem to have a significant effect on the user cost for housing. We therefore also look into the effect of reduced user costs on the house price development. Another important determinant of the user cost is the expectations about house prices in the future. Drawing on the papers of Shiller (2007), Piazzesi and Schneider (2009), and García-Montalvo (2006) we discuss the impact of expectations on house prices, which Poterba (1984) considers to be rational. Poterba (1984) does not consider the accessibility of credit in his model. We therefore draw on the work of Anundsen and Jansen (2011) and discuss whether there has been a self-reinforcing effect between credit growth and house prices.

4.2.1 Income and unemployment

The general level of income has an effect on the purchasing power of the consumers. This enables them to pay higher prices for housing and can thus affect house prices.

As demonstrated in chapter 3.5.1, Spain experienced a yearly increase of 3.96 % in real net disposable income per capita from 1995 until 2007. After 2008, a period of three years of decline was awaited. As for unemployment, the total rate went down from 18 % in 1997 to 8 % in 2008. This reduction in unemployment faced a dramatic turn after 2008, and by 2012 the total unemployment rate had reached 25 %. Among the population in the start-up phase, the age group 20-34, the unemployment was particularly high, reaching 35 % in 2012.[102] After

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[102] For this age group we do not have data prior to 2005.

2007, the employment in the construction sector decreased significantly, and between 2007 and 2012, the employment in this sector went from 14 % to 7 %.

According to the framework of Poterba (1984), a reduction in disposable income due to reduction in wages or unemployment will cause an exogenous inward shift of the demand curve as the consumer´s purchasing power decreases. From a strictly macro perspective a change in employment could also alter the supply side, given that a high share of the working population is employed in the construction sector. When the number employed in this sector decreases, an oversupply of skilled construction workers is created. This might lead to lower construction costs if wages are reduced, and hence lead to higher revenue. However, data obtained on labor cost imply no such change in wages, so this mechanism will not be further discussed.

García-Montalvo (2008) found that between 25 % and 40 % of the changes in house prices could be explained by the unemployment rate in the period from 1999 to 2007.[103] In the same study, he found that changes in the GDP explained approximately 50 % of the changes in house prices. This is in line with the results of García-Montalvo (2003) who found that the gross disposable income explains 41.1 % of the changes in house prices in the period from 1987 to 2001.

Sosvilla (2008) also found a positive correlation between real income and demand for housing using an inverted model for housing demand.[104] The income elasticity of demand for housing services is found to be 1.74 in the period 1995 to 2007, which suggests that an increase in income of 1, rises the demand for housing by 1.74.

When disposable income rises, people tend to spend more, affecting the demand for housing. Moreover, increased house prices can also have a positive wealth effect for homeowners: When the value of capital invested increases, an increased feeling of wealth might occur. This again may lead to higher investment. As many people have a big part of their wealth invested in housing, a rise in the house prices might lead to increased demand for

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[103] The regression analysis used is inspired by García-Montalvo (2007b) and is based on real GDP, unemployment (also youth employment is tested without much different results), interest rate, population, real construction costs and rentability on IBEX (Iberia Index).

[104] Based on the housing stock, population, real income, rental cost of housing (estimated user cost) and the income and price elasticities of demand for housing.

even more expensive houses, as people feel they may afford it. The wealth effect, though, is only applicable for consumers that already own a house.

When comparing disposable income with the demand for houses measured by the sales of houses, we see that they are correlated and both increasing from 1997 until 2006. Therefore, the increase in disposable income might rationalize some of the rise in the prices from 1997 to 2006. The correlation between increasing disposable income and house prices is in accordance with the findings of Sosvilla (2008).

If income is reduced, however, people may save more because of the uncertainty the reduction in income brings. This should lower the house prices. Morevoer, with decreasing house prices, the wealth effect diminishes, reducing demand even further. Unemployment and income affect one another, so with increasing unemployment rates from 2008, income was also reduced. Unemployment increased especially among young inhabitants in the start-up phase, who are believed to have a greater effect on demand for housing. This suggests a more rapid reduction in prices as demand decreased faster.

Based on the study of Sosvilla (2008), it is likely that the increase in disposable income between 1997 and 2007 can account for some of the surge in house prices. House prices and wealth also have a reinforcing effect, as surge in house prices can have an effect on the homeowner's sensation of wealth. Lower unemployment rates towards 2007 also contribute to increasing average disposable income.

When considering the fall in house prices after 2008, it is difficult to determine the causality of reduced income and employment in relation to house prices. After 2008, unemployment went up reducing disposable income, and this could have contributed to drive house prices down. Alternatively, considering that a relatively large part of the Spanish working population is employed in the construction sector, and that a high share of household wealth is invested in housing, the decline in house prices might also have contributed to a reduction in both employment and disposable income. It could be suggested that demand was reduced first, as the number of unsold houses increased severely in the years prior to 2008. This implies that the turning point in house prices was not mainly driven by disposable income. However, it is likely that the reduction in disposable income and high unemployment rates, regardless of causality, contributed to keep prices on a downward trajectory after 2008

4.2.2 Demographics

Demographic changes could be a possible driver of the house prices as they have effects on both supply and demand. In this chapter we will consider the effect of demographics on the house prices in the period investigated, with special emphasis on immigrants and young adults in the age group 20-34.[105] This age group is as previously mentioned believed to have a particular impact on demand.

In Spain, the growth in the total population from 1998 to 2011 has been steady every year, with a slightly reduced growth rate towards the end of the period. We do not have data on the years 1997 and 2012, but we assume that the population growth in these years follow the same path. Immigrants have represented a bigger share of the growth in certain years, especially between 2000 and 2008. The number of people in the start-up phase, in the age group 20-34, increased by 9 % from 1998 to 2005. A minor decline was seen between 2005 and 2007 before the reduction intensified between 2008 and 2011 with a decline of 7.5 %. The share of immigrants in this age group has represented an increasing share after 1998, also in the years after 2008.

According to the theoretical framework presented in this thesis, the housing stock is constant in the long-term equilibrium, under the assumptions that income growth and population growth are constants. Increased population growth in the short run will cause an exogenous shift of the demand curve resulting in higher prices and higher levels of new construction. In a growing economy Poterba (1984) assumes that house prices will grow as a function of GDP and population growth.[106]

In a 2010 study, Garriga develops a quantitative theory explaining the change in the level of house prices from 1995 to 2007. The model considers a small open economy with two productive sectors, each producing consumer goods and residential investments respectively. The price of land, interest rates and different demographic factors are considered key

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[105] There are more factors that could have affected demographics. Examples are the baby boom in the 80s and increased divorce rate in later years, however, this is not discussed here.
[106] See footnote 22

elements.[107] When decomposing the contributions from each factor he finds that immigration alone accounted for 33 % of the house price development between 1995 and 2007. However, Garriga (2010) points out that this single-factor decomposition analysis disregards the interaction of combined effects. Combining the effect of low interest rates and immigration rather than considering them separately provided an additional effect of 22 % on house prices. It is, however, important to mention that this model does not include financial frictions but consider a complete market.[108]

The results of Garriga (2010) are in line with the findings of Gonzalez and Ortega (2009). They did research on the inflow of immigrants in regions and how they affected new construction and house prices between 1998 and 2008. Only immigrants in the working age population were considered. The results of Gonzalez and Ortega (2009) depended on the outflow of Spaniards in the regions, whether the immigrants started to work in the construction sector and whether the immigrants rented or bought their houses. They found that, apart from increasing demand for housing, immigration also had a positive effect on supply: The large inflow of immigrants, particularly males, contributed to making housing supply significantly less inelastic due to a higher workforce the in construction sector. Gonzalez and Ortega (2009) found that the total effect of immigration, both on supply and demand for housing, accounted for 30 % of the price increase in the period from 1998 to 2008. More specifically, a 1 % increase of immigrants led to a 3.2 % increase in the house prices.[109]

According to García-Montalvo (2008), the increase in the prices from 1999 to 2007 is not caused by a demand shock due to population growth. Based on a regression analysis by García-Montalvo (2007b)[110], he argues that only 5 % of the increase in prices may be explained by changes in the population. This lower effect is claimed to be due to the fact that both the demand and the supply increased at the same time.

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[107] The effect of regulation of land on land prices, as well as the effect of current account deficits on interest rates are also taken into account
[108] The significance of this is that the model also considers people not being able to take on a mortgage. In other words, everybody that wants to buy a house will do so even if they do not qualify.
[109] Based on an average house prices throughout the period.
[110] Based on real GDP, unemployment (also youth employment is tested without much different results), interest rate, population and IBEX (Iberia Index).

It is natural to believe that a change in the number of people in the start-up phase will alter the demand for houses to a greater extent than what changes in the rest of the population would. This age group typically has a more immediate need for housing compared to those under 20, who can still live with their parents, and to those over 34, who probably already have a house. As the number of Spaniards in this population group decreased from 2005, it is likely to believe that it had a particular impact on the demand for housing. From 2005 the share of immigrants increased, while young Spaniards left the country, still the population in this age group grew. This could imply that the effect on the house prices until 2008 due to Spaniards leaving was lower than the total effect of the immigrants arriving.

As the population increased together with a strong increase in supply, García-Montalvo´s (2008) proposition of demographics being a less important driver of house prices, seems reasonable. However, one must keep in mind the fact that immigrants were a big part of both the construction sector and the increase in prices (Garriga, 2010; Gonzalez and Ortega, 2009). As new workers tend to be fired first, it is likely to believe that the increase in the unemployment rate due to reduction in construction affected the immigrants first. This could explain the reduction in the inflow of immigrants after 2008. Fewer immigrants and a smaller population in general, coupled with an increased outflow of young Spaniards, are likely to reduce the prices even more.

All the studies mentioned are based on different assumptions, so comparing them directly would be inadequate. It seems, however, that the increased growth in population prior to 2007 had an effect on the demand for housing. The number of young Spaniards leaving Spain accelerated from 2005, however prices increased until 2008. This indicates that the effect of the younger population group was lower than that of the immigrants. However, the fact that supply and demand grew simultaneously implies that the effect of population growth on house prices is not the most important driver of house prices prior to 2008.

4.2.3 The user cost

The user cost is an important determinant of the demand for housing. In chapter 3.5.3 data on factors such as the interest rate, inflation and tax deduction for homeowners are presented

together with an estimate of consumers' expectations about the general economy in Spain. The focus in this chapter is to analyze the effect these factors have on house prices.

According to Poterba's (1984) framework, a reduction in the user cost will push house prices up. The framework presented in chapter 2, shows that the annual user cost must equal the annual imputed rent (value of owning) in the short-term equilibrium. In the long run a reduction in the user cost will lead to a greater demand for housing. The demand curve will shift out and increase house prices. Gradually, the sector for new construction will react by increasing the supply until reaching a new long-term steady state where supply equals demand. The new steady state will have higher levels of supply represented by a bigger housing stock, and higher house prices than the level in the initial steady state.

The interest rate and inflation

The interest rate is an important component of the user cost. A reduction in the interest rate reduces the user costs and increases demand for housing. There is high consensus around the fact that the interest rate is a likely driver of house prices. According to Poterba's (1984) model, the effect of inflation on the user cost is uncertain. Inflation increases house prices, implying a lower user cost, which again increases the expected capital gains. Higher inflation can also contribute to an increase in the user cost since inflation increases nominal interest rates.

Comparing our data on inflation and house prices from chapters 3.1 and 3.3 one can observe that while inflation has remained at historically low levels after 1994, house prices rose dramatically from 1997 to 2008. Actual inflation is therefore not a likely driver of house prices.

From chapter 3.5.3 we show that nominal interest rates stabilized at historically low levels after the entry into the EMU in 1999. After having fallen from 13 % in 1992, the nominal interest rate stayed at a level between 2 % and 5 % between 1999 and 2012. Discounting the nominal interest rate for inflation does not change the overall trend. The real interest rate went down towards 2005. Between 1999 and 2005, the level of the real interest rate was particularly low between 1 % and -1 %. From 2005 onwards the real interest rate rose to between 3 % and 5 %, before dropping again after 2008. Considering this significant increase

from 1999 to 2008, it seems likely that lower interest rates might have been a driver of this development. However, interest rates cannot explain the sudden drop in prices after 2008.

The development in the interest rate in Spain should be seen in the context of the profound impact of the entry into the EMU in January 1999 described in more detail in chapter 3.1. In the mid-1990s the traditionally high inflation rates, monetary shocks caused by devaluations of the peseta, and high budget deficits were replaced by lower inflation and a more solid fiscal policy. The convergence criteria for entering the EMU were met and Spain was able to join from the beginning in January 1999. The monetary policy of the entire union was now in the hands of the European Central Bank.

Lis and Herrero (2010) point out that the process related to the entry to the EMU was beneficial for the Spanish economy through a significant reduction of risk premium, particularly those related to inflation and currency risk. This can be reflected in the real interest rate, which moved from levels of between 5 % and 6 % in the beginning of the 1990 to around zero after the entry into the EMU in 1999. The European Central Bank fixed the nominal interest rate to levels which were consistent with the average conditions in the euro area. This implied very lax monetary conditions for the Spanish economy resulting in a strong expansionary impact (Lis and Herrero, 2010). Lis and Herrero (2010) draw a link between this expansionary impact to domestic credit growth and the surge in house prices after 1999.

This is in line with the findings of Ayuso, Blanco and Restoy (2006). They study the correlation between real interest rates and house prices in Spain between 1987 and 2004. Their findings imply that the real interest rate is a key variable for the development in house prices between 1987 and 2004. Using the ex-post real interest rate, which is the nominal interest rate minus actual inflation, they find that almost all the movement in house prices can be attributed to changes in the real interest rate. However, they also find that the ex-post real interest rate is not a good proxy for the actual real finance cost. During the late 1990s and the beginning of the 2000s, there was a lot of uncertainty regarding the success of the nominal convergence to the EMU. Consequently ex-ante real interest rates in this period seem to be higher than actual ex-post real interest rates. This implies that the actual finance cost might have decreased significantly less than what the ex-post real interest rate should suggest. This paper does not cover the price development after 2004, however, it demonstrates the

importance of expected inflation when looking at real interest rates. Considering the turbulent history of the Spanish economy this might be significant.

Aspachs-Bracons and Rabanal (2009) study the drivers of Spanish housing cycles in the period 1996 to 2008. They point out that the two main factors behind the housing boom from 1997 to 2007 have appeared to be the reduction of nominal interest rates and demographic factors. The strong synchronization between these shocks and the housing boom has led many economists to draw a causal relationship between them. Aspachs-Bracons and Rabanal (2009) execute a formal analysis estimating the importance of these drivers using a New Keynesian model of a currency area. The model contains a rich set of supply, demand, and monetary shocks and the relative importance of each shock is studied. The results contradict most other findings and suggest that the nominal interest rate shock was of minor importance and only relevant in 2006 and 2007 when the ECB increased the nominal interest rate from 2 % to 4 %. However, it must be pointed out that one of the shortcomings of their model is that their estimations implied that the reduction in interest rates occurred between 1996 and 1999 and that house prices peaked in 2004. This reduces the reliability of their findings. However, the fact that the nominal interest rate shocks had an insignificant effect on the house price development raises the question whether the role of the interest rate in the house price development has been overestimated.

In light of the framework used in this thesis and the additional literature on the correlation between house prices and the interest rate, it is still likely to believe that the interest rate has been an important driver of the house price development between 1997 and 2008. One must, however, keep in mind that the ex-post real interest rate, discounted for actual inflation, which is the one we are operating with in this thesis, serves as a proxy for the ex-ante real interest rate, based on expected inflation. Ayuso, Blanco and Restoy (2006) point out a certain undervaluation of the real interest rate using the actual ex-post real interest rate, making the reduction in user cost appear significantly higher than it really is. Nonetheless, it is likely to believe that the uncertainty regarding the success of the Spanish integration into the EMU was reduced in the years after the 1999. Therefore the undervaluation of the effects of the real interest rates was reduced towards 2006. Poterba (1984) eliminates this problem in his framework by assuming that all actors in the market have perfect foresight about the future path of the economy. In his framework the expected inflation is a perfect proxy for actual inflation.

In sum, based on the framework of Poterba (1984), and additional literature, it is likely that the interest rate has been an important driver of the house price development between 1997 and 2007, and that the entry into the EMU was significant. However, it is also likely that the effect of the real interest rate has been overestimated in earlier studies due to discrepancies between actual and expected inflation. Interest rates increased somewhat between 2007 and 2008, before stabilizing at lower levels. As previously mentioned, it is, however, difficult to determine the effect of interest rates on the decline of house prices after 2008.

The tax deduction

Another important component of the user costs is the tax benefits associated with buying a house. According to Poterba's (1984) model a higher tax deduction rate reduces the user cost. All else being equal both the demand for housing and house prices will increase eventually.

As presented in chapter 3.5.3 the tax deduction rate in Spain remained at 15 % until 1998. A new law introduced in 1998 allowed for the inclusion of interest payments in the deduction base. This new law favored the ones lending money for house purchase. As of the new tax law of 1998 the deduction rate for mortgage installments increased to 25 % the two first years after the acquisition of the house, and to 20 % thereafter. If the house purchase was financed fully through private equity, the deduction rate would remain at 15 %. Our data clearly show the effect of this legislation: The average annual deduction more than doubled in one year, from 369 euros in 1998 to 766 euros in 1999. From 1999 to 2006 the number of people deducting taxes from house purchase increased by 64 %. This is consistent with our data on the number and amount issued in the period. The amount of mortgages issued after 2001 increased towards 2006 and the number of mortgages increased significantly, though at a lower rate. This tax legislation remained unchanged until the introduction of The Law of a Sustainable Economy in 2006. The deduction rate on mortgage installments was now reestablished at 15 %, and the number of people with the right to deduct house purchases from their taxes was reduced significantly as income requirements were to determine whether deductions should be granted at all. The average deduction was reduced from 900 euros to 720 euros between 2006 and 2010 and the number of people deducting house purchases from their taxes was reduced by an average of 2.5 % annually.

The significance of the tax deductions on the user cost can also be seen in figure 32 showing household ability to take on a mortgage. This ability to take on a mortgage is expressed as the ratio of total mortgage payments over household disposable income, and it is presented both with and without the tax deduction. The graph demonstrates that the tax deduction has reduced this ratio by between 7.5 % and 13 % the since 1998.

Unfortunately there is no available literature on the effect of the tax legislation alone on house prices in Spain. However, both the framework of Poterba (1984) and the data obtained on the effect of the tax legislation indicate a significant effect on the user cost. The fact that the average annual tax deduction more than doubled from 1998 to 1999, increasing the number of tax deductions substantially, indicates that the new tax laws of 1998 have had a significant effect on the demand for housing. It is therefore very likely that the increased tax deduction has been an important driver of house prices between 1998 and 2007. As for the sudden drop in house prices; it is difficult to determine the importance of the reduced tax deductions after 2006 on the negative house price development after 2008.

Expectations

The user cost function in Poterba's (1984) model demonstrates how expectations about future house prices affect the user costs. The rationale is that one would avoid a future potential loss by selling a house that is expected to lose some of its value. In this case, the expectations about future house prices would increase the cost of owning. On the contrary, if one expects the value to go up, keeping the house would ensure future potential capital gains, reducing the cost of owning. The model therefore explains the mechanism of how expectations affect the user cost, and thus demand for housing.

In the long-term demand function, however, Poterba (1984) assumes that all actors in the market have perfect foresight about the future path of the economy, and the expected nominal house price appreciation is assumed to be equal to real house price appreciation plus inflation. In the demand function, the real price appreciation is therefore a function of actual inflation, not expectations. Poterba (1984) thus assumes that people's expectations are perfectly rational.

There is high consensus around the fact that Spain experienced a speculative bubble in the housing market that burst in 2008 followed by a dramatic fall in house prices. Poterba's (1984) assumptions about rational expectations and perfect foresight into the future path of the economy are therefore inaccurate. When considering the role of expectations in the development in house prices between 1997 and 2012 we will therefore draw on the ideas of Shiller (2007), Piazzesi and Schneider (2009), García-Montalvo (2006) and Kahn (2008). We will also look into how some of the fundamental drivers such as the interest rate and demographics might have contributed to further create and further inflate this speculative bubble.

As pointed out in the presentation of theories, Robert Shiller (2007) argues that expectations alone can affect the price of assets: if everybody expects house prices to rise, the prices can go up only because more people choose to buy now hoping for capital gains in the future. This phenomenon is what is referred to as a speculative bubble defined as a "self-fulfilling surge in prices, significantly more than warranted by fundamentals" (Grytten, 2012).

In chapter 3.5.3 we presented data on the Spanish consumer confidence index from 2004 to 2012. Comparing this with the development in house prices, we see very high levels of consumer confidence from 2004 to 2006, when house prices were rising. In fact, the consumer confidence was close to 100, which implies maximum optimism. A fall in consumer confidence, to almost 50, is observed towards the end of 2007 before the dramatic fall in house prices in 2008. The consumer confidence rose slightly in 2010 and 2011, while house prices continued to fall. In 2012, the consumer confidence index dropped to even lower levels of around 40.

From 2000 to 2005 García-Montalvo (2006) carried out a survey of 1500 people who were planning to buy a house in 2005. The participants were selected from 5 different cities with different levels of growth in house prices relative to the average.[111] Approximately 82 % of the participants were planning on buying a main dwelling, while the remaining 10.7 % was buying a secondary residence. The results of the survey were consistent with the existence of irrational expectations in the Spanish housing market:

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[111] Coruña (Significantly lower than average) , Madrid, Barcelona (Close to the average, but a little lower) , Murcía (close to the average but a little higher) and Valencia (Sinificantly higher than the average.

- 65 % of the participants considered the capital gains associated with buying a house as either "very important" or "fairly important".

- 37.2 % of the participants knew someone who sold a house with a profit.

- The most important motivation for buying a house was the fear of not being able to afford a house in the future, due to increasing prices.

This information underlines the importance of future capital gains as a motivation on the decision to buy a house, and thus the importance of the speculative aspect of the house as an asset.

- 95 % of the participants believed that house prices were overvalued: 40 % considered the overvaluation to represent as much as 50 % of the house prices. Still, they expected that the prices would increase by 23.4 % annually the following 10 years.

The expectations about future house prices were clearly very optimistic and seem to be based on recent experience. This supports the theory of Piazzesi and Schneider (2009) who argued that expectations are driven by momentum. Another interesting finding is that even though the perception among the participants implied a significant overvaluation of house prices, they still projected prices to rise further the following 10 years. This paradox in consumer behavior has been observed in other countries experiencing speculative bubbles (Piazzesi and Schneider, 2009 and Kahn, 2009).

In addition to being driven by momentum, expectations can also be affected by productivity-swings in the economy. As mentioned in chapter 2, Kahn (2008) attributes the price fluctuations since the 1960s to economic factors arguing that productivity swings can determine the price of housing through income growth and long-term income expectations. Spain experienced strong economic growth towards 2008, before the global financial crisis. This upturn towards 2008 can thus contribute to explain the creation and inflation of the bubble, while the productivity slowdown after 2008, crushed the expectations about future income growth and, hence, busted the housing bubble in Spain.

There are different methods used for analyzing a potential bubble in housing markets. Some methods imply the econometric estimation of the fundamental house price, based on fundamental drivers of supply and demand. The difference between the estimated fundamental price and the actual price demonstrates the overvaluation. Using this method, Banco de España estimated an overvaluation of house prices of between 24 % and 35 % in 2006 (García-Montalvo, 2006). Another method used implies analyzing the development in

price to rent ratios. The price to rent ratio is calculated by dividing the house prices by the annual rental cost, demonstrating the attractiveness of owning versus renting. If this ratio increases significantly over time, it might be an indication of a housing bubble. A third method is to measure the bubble component of house prices by extracting information regarding expectations directly through surveys. Table 2 provides an overview of different estimations on the size of the Spanish housing bubble explaining the degree to which irrational expectations have influenced house prices.

Table 2: Estimations of the size of the Spanish housing bubble (2002, 2003, 2005, 2006).[113]

Institution	Date	Estimation	Method
BBVA	December 2002	28 %	Regression
FUNKAS	April 2003	28.5%	Price to rent ratio
The economist	July 2003	30 % - 52 %	Price to rent ratio
Banco de España	September 2003	8 % - 20%	Regression
PwC[112]	January 2005	20 % - 30 %	Survey
Banco de España	2006	24 % - 35 %	Regression

Different institutions have executed the estimations and all three methods are represented in the table. Although the results vary to some extent, they all indicate the presence of a housing bubble from 2002 to 2006. Comparing these results in an attempt to determine the development in the size of the bubble over time is difficult, given that different methods have been used.

García-Montalvo (2006) argues that the low interest rates, coupled with the extensive credit growth have contributed to inflate the housing bubble. The rationale is that lower interest rates permit consumers to pay a higher price for a house and maintain the same level of expenditure on the mortgage. Given a self-reinforcing relationship between credit growth and house prices, consumers become more able to take on larger mortgages as house prices continue to grow. Consequently, financial institutions reduce credit restrictions and create an

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[112] PriceWaterhouseCoopers
[113] The data were obtained in from García-Montalvo (2006)

excess of liquidity allowing the bubble to continue to grow.[114] The correlation between housing bubbles and low interest rates is in line with the findings of Hott and Jokipii (2012). In an empiric study of several countries in Europe, including Spain, they find that there is a strong link between low interest rates and the creation of housing bubbles. Their findings further imply that impact is especially strong when interest rates are "too low for too long". Studying housing markets in the US, Myrmo (2012) finds that a sharp increase in population, which implies a steep rise in demand, can cause house prices to exceed extensively from their fundamental values creating a housing bubble.

Both the consumer confidence index, as well as the survey carried out by García-Montalvo (2006), support the suggestion that expectations have played a major role in the development in house prices in Spain from 1997 to 2012. The somewhat irrational expectations identified in García-Montalvo's (2006) survey from 2000 to 2005 can contribute to explain the impressive increase in house prices towards 2006. In addition, the drop in consumer confidence in the end of 2007 also coincides almost perfectly with the following fall in house prices in 2008. Furthermore, estimations of the size of the housing bubble in 2002, 2003, 2005 and 2006 done by different institutions using different methods, support the fact that irrational expectations have been an important, perhaps the most important driver of house prices from 1997 to 2012. The additional literature suggests that the low interest rates, high credit growth and sharp increase in population after 1997 have contributed to the inflation of the housing bubble.

In sum, it is likely that expectations have played an important, and perhaps the most important role, in the development in house prices between 1997 and 2012. It is also likely that low interest rates and high credit growth coupled with a sharp increase in population had an effect on the bubble. These drivers can therefore be considered even more important in the presence of irrational expectations.

4.2.4 Credit development

As previously mentioned, most Spaniards take on a mortgage to finance their house purchase. In this chapter we focus on the impact of the credit development on the house price

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[114] See chapter 4.2.4 for a more thourough description of this effect.

development between 1997 and 2012. The credit availability has increased significantly in Spain during the entire period, and the evolution has been one of the hastiest in Europe. A large part of this development can be related to low interest rates, discussed in more detail in chapter 4.2.3.

The rapid increase in credit is mainly due to an upturn in lending for house purchase. The amount issued from 1997 to 2003 nearly tripled. In only four years, from the first quarter of 2003 to the first quarter of 2007, the total amount of mortgages issued for dwellings increased with approximately 130 %. From 2007 onwards, a dramatic change was seen and the amount of the loans issued was back at the 2003 level in the first quarter of 2010. The average LTV ratio increased towards 2006 before declining and stabilizing at levels between 55 to 58 % the past three years. We do not have information about the average maturity of residential mortgages after 1996, but from 1996 to 2004 an increase from 18 to 25 years was observed.

Poterba (1984) does not consider credit conditions in his model, however, other studies suggest that they are important. By using a model based on the price to rent ratio, Duca, Muellbauer and Murphy (2009) find that there is an effect of mortgage credit standards on house prices in the US: American house prices were driven by the LTV ratio for first time buyers in the period from 2002 to 2005. Moreover, Anundsen and Jansen (2011) explain how house prices and mortgages in Norway from 1986 to 2008 have a self-reinforcing effect, creating a financial accelerator.

Using a vector error-correction model, Gimeno and Martínez-Carrascal (2006) studied the interactions between house prices and loans for house purchases in Spain over the period 1985 to 2004. Excluding the effect of the interest rate on mortgages in the short run, they found that in the short run the self-reinforcing effect was present. They also suggest that if the credit level is above its long-run equilibrium, a decrease in both credit and house prices should be seen. This might be caused by credit institutions not being willing to issue more loans when the credit level is high due to risk.

According to these findings, we see that the level of credit issued for house purchase has had an effect on the house prices in Spain from 1985 to 2004. This effect also seems to be present in the period from 1997 to 2006. Based on the data in section 3.5.4 the issuing of new mortgages increased significantly between 1997 and 2006 at the same time as house prices

reached historic heights. With growing house prices, the value of the property increases, thus the collateral value of the house grows. This again gives the homeowner the ability of taking out an even higher loan, thus pushing prices up, and creating a financial accelerator. For the banks, a higher collateral value also signifies less risk associated with lending, resulting in a desire to issue more credit. This could be one reason for which the house prices increased in the period from 1997 to 2008. Figure 43 demonstrates the correlation between house prices and the size of mortgages.

Figure 43: Correlation between house prices and average mortgage size for dwellings (index) (2003 = 100) (2003-2011 second quarter).[115]
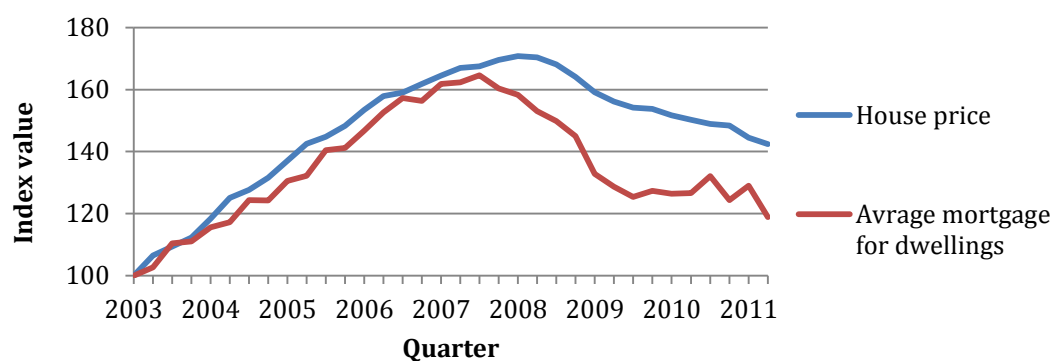
On the contrary, with prices declining the collateral value is reduced, giving credit institutions a lower willingness to grant loans as the household wealth shrinks relative to their debt. Supply of credit is reduced, which again reduces household liquidity and thus resulting in lower house prices. This may also explain the reduction in prices as the average amount of mortgages issued in the period after 2007 was reduced. The reduction of the average size of mortgages, however, started before the house prices declined, so the market could possibly have sensed a turn before the drop in prices started in 2008. It is important to mention that this self-reinforcing effect is only applicable to investors who already are in the real-estate market. The effect for tenants is a change in rental price, not their lending abilities, as they do not own the house themselves and cannot use it as a collateral value.

As for the LTV ratios, an increasing ratio for first time buyers is seen together with the appraisal of the house prices towards 2006, and a reduction for people already in the market.

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[115] House prices: Ministerio de Fomento (2012c), Average mortgage for dwellings: INE (2012j)

The reason the ratio is decreasing for the segment that already owns a home might be explained by the reduced need of credit as house prices increases. As the value of your home increases the surge in prices will give an automatic reduction in the LTV ratio. The fact that these buyers often have been in the market for a period of time and have already amortized on their mortgage, often over several years, also needs to be taken into account and reduces the LTV ratio even more. Allowing a high LTV ratio enables first time buyers to take on higher loans and pay higher prices for housing. Thus the rise in LTV can have affected the house price development. However, the LTV ratio might have increased for first time buyers as a result of higher house prices. If credit institutions considered housing a safe investment, they might have increased the LTV ratio in order to enable first time buyers to invest in housing, even though prices were rising. This may be a result of the house prices increasing more rapidly than overall inflation. The incomplete data on the LTV ratios from 1995 to 2004, and lack of specific data on the different segments from 2007 onwards make it difficult to determine the LTV ratio as a driver of house prices.

The average maturity of mortgages in Spain, which increased from 18 to 25 years between 1996 and 2005, can also have had an impact on the development in credit and house prices. Longer maturity of mortgages implies that consumers can take on higher loans, enabling them to pay higher prices of housing. It is, however, difficult to determine whether the average maturity affected house prices, or whether it increased as a result of the surge in house prices.

In this part of the analysis it is discussed how credit affects house prices and vice versa. It is important to mention that there are multiple drivers that affect the credit development in Spain not mentioned here. Some keywords for further reading on the credit development from the banks´ side are for instance the impact of securitization on the supply of credit.[116] From the consumers´ perspective relations to the bank can also be significant as it might be that banks have a higher propensity to issue loans to customers they already know. Furthermore default ratios, and interest rates are other important factors not discussed in this part.[117]

Although we have not considered all factors that affect the credit development, a strong relationship between the credit and house prices is found. However with regard to loan to

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[116] See Jiménez et. al (2011)

[117] See Hetland and Mjøs (2012) for reading on bank relations and Blanco and Gimeno (2012) for information on default ratios. See 4.2.3 for a more thorough review of the interest rate.

value ratio and average maturity, we cannot determine whether these two factors have a direct impact on house prices, or if they simply are a result of the banks desire to issue more credit towards 2006.

4.3 Supply and demand

In order to get a more holistic picture of the drivers of house prices, supply and demand factors must be considered simultaneously. House prices increased significantly towards 2008 in spite of the oversupply provided by the sector for new construction. Given that there was an oversupply of housing, this should have had a negative effect on house prices. The price of land had grown at a much higher rate than house prices towards 2007 and is considered the most important supply factor of the house price development. However one must keep in mind a possible reversed causality where house prices have been the driver of land prices and not vice-versa. The particularly low rental share in Spain in 2000 can also have contributed to the increase in demand for housing and hence house prices. Whether the small rental share is due to a low supply or a low demand for rental housing, it is likely that the house price development would have been less intense if renting was a more easily accessible alternative to buying. Alternatively, the mentality favoring homeownership can have incentivized the purchase of housing regardless of the price of housing. However, we do not have empirical evidence supporting this hypothesis, and can therefore not determine whether the low rental share has been a driver of house prices.

In spite of an oversupply of houses and increasing prices, demand remained at high levels until 2006. This underlines the significance of the drivers of demand and implies some kind of market failure in the Spanish housing market in the period prior to 2008. High population growth, especially among people in the start-up phase as well as immigrants, can be considered an important driver of demand. However, the oversupply of housing suggests that this has not been the most important driver of house prices. Disposable income, which increased steadily towards 2008 coupled with low levels of unemployment towards 2007, improved the purchasing power of the Spanish population, and kept demand at high levels in spite of the high house price level. The average tax deduction, which more than doubled between 1998 and 1999, together with very low real interest rates after the entry into the EMU in 1999, have contributed to reduce the user cost. Consequently demand has increased

together with house prices. All these drivers of demand have had a certain influence on house prices, but their relative importance and especially the effect of low interest rates, might have been overrated in the past. The most important factor reducing the user cost seems to be the irrationally high expectations about future house prices in the Spanish market. Some attribute as much as 40 % of the price development to this driver alone. The increased credit growth towards 2007 has increased the liquidity of Spanish consumers and kept demand at high levels even in the presence of a housing bubble. The reinforcing effect between credit growth and house prices, combined with very low interest rates and high population growth are factors that can contribute to create and further inflate housing bubbles. So in the presence of irrational expectations, these drivers can be considered even more important.

In 2007 the demand for housing was reduced significantly along with the level of new construction, followed by stagnation in the house price development and an abrupt decline after 2008. This is in line with the reduction in the price of land and the fact that the rental share increased steadily from 2006 to 2011. It is, however, difficult to determine whether these supply factors were drivers of the reduction of house prices, or whether they declined as a consequence of reduced house prices. After 2006, the level of new construction increased along with construction costs, which should imply higher house prices. Therefore, the decline in house prices after 2008 also seems to be driven mostly by demand factors. The significant rise in unemployment rates and reduction of disposable income are both factors that should lead to a reduction of demand for housing. However, considering the fact that a large proportion of people's wealth is invested in housing and the high share of employment in construction, the development in these factors might also be a result of reduced house prices. The reduction in tax deduction after 2007, coupled with increasing real interest rates between 2007 and 2008 should contribute to reducing house prices. The reduction in the average amount of credit, seen after 2007, should have a negative effect on house prices and might therefore have been drivers of house prices after 2008. However, once again, the reinforcing effect between house prices and credit growth might also suggest a reversed causality where falling house prices are driving the reduction in credit growth.

The importance of all these demand factors and the causality between them and the house price decline is difficult to determine. It is therefore likely that expectations about future house prices were the most important driver of both the surge and decline in house prices. The consumer confidence index dropped dramatically towards the end of 2007 implying that

expectations represent the most important driver of the house price decline after 2008. It is, however, likely that the other demand factors, regardless of causality, have contributed to keeping house prices at lower levels after the decline in expectations.

Looking back on the model of Poterba (1984) and reconsidering its applicability for the Spanish housing market, we see that many of the most important drivers are considered. The interest rate, tax deduction, construction costs and expectations are all included in the framework. The areas in which Poterba's (1984) model fails to describe the house price development in Spain between 1997 and 2012 are related to the assumption of rational expectations in the housing market, and the omission of the price of land in the output function of the sector for new construction. The framework also fails to describe the effect of credit growth on house prices. These have all been pointed out previously as clear shortcomings of the model. During this analysis we have determined another potential weakness in the model of Poterba (1984): Disregarding the level of supply of rental houses and their potential effect on house prices might be a significant shortcoming, especially in the Spanish case.

4.4 The role of the government

In determining the policy implications of the findings in this thesis one must distinguish the drivers which are influenced by the government from market-based drivers.

The irrational expectations represent a market failure, which is not directly controlled by the government, but expansionary policies can give a signal to the public that the economy will continue on an upward track. The policies regarding tax deductions are set by the government. Although the interest rate is both under government and market influence, the entry into the EMU, which was a decision made by the government[118], seems to be the driving force behind the very low interest rates after 1999. Poterba (1984) also points out increased construction costs as a driver of house prices. The labor component of construction costs is usually under government influence. However, since we have considered construction costs to be a less important driver of house prices between 1997 and 2008, this will not be further discussed.

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[118] This decision was taken with high consensus in the population.

The same can be said about government regulation of immigration. García-Montalvo (2010) points out land regulation as a possible driver of house prices. This factor is highly influenced by the government. In this thesis we point out that the low rental share in Spain might have been a driver of the house price development during the housing boom (1997-2007). Whether demand or supply driven, this low rental share seems to be influenced by the legislation and the mentality created during Franco's dictatorship and can therefore be considered a policy driver of house prices.

In sum, we see that the government might have influenced the house price development and four government drivers stand out as potentially important: In discussing the government influence on the house price development we emphasize tax benefits associated with house purchase, the entry into the EMU, the regulation of land and rental laws.

Tax deductions

The tax deductions considered in this paper have two effects on the demand for housing. The first is associated with the deduction on the mortgage payments or on the equity used to buy the house. The second effect is associated with the deduction of mortgage interest payments, which was introduced in 1998. This tax policy favored the people borrowing money for house purchase with higher tax deduction rates. Both policies have a positive effect on the demand for housing, incentivizing consumers to invest in housing rather than renting a house or investing their money in other financial assets. The tax deduction on the house purchase has remained relatively stable since 1975. However, the new laws of 1998 had a significant effect, both on the amount and number of tax deductions. In only one year, tax deductions doubled. In this paper we have determined that this new law was an important driver of demand until 2007. The law of 1998 did not only increase the demand for housing, it is also likely that it contributed to increase lending for house purchase. As for the new law of 2006, which reduced the supply of land, the effect on house prices in uncertain.

The entry into the EMU

After the entry into the EMU, the interest rates were set based on the average conditions of the entire union. Consequently, Spain experienced a very lax monetary policy resulting in an

expansionary effect on the Spanish economy. Garriga (2010) points out the importance of monitoring every single lending institution in situations like this, and also to supervise the national system as a whole to avoid correlated risk. The lack of sufficient supervision might have allowed for the self- reinforcing effect between credit growth and house prices. The fact that tax deductions for those borrowing money for housing were increased in 1998, and that the lending conditions towards 2006 were not restricted with regard to the LTV ratio, and to the maturity of mortgages, demonstrates the failure of Spanish housing policies after having lost the interest rate weapon.[119]

Regulation of land

Many Spaniards point out the deregulation of land introduced in the land law of 1997 as one of the main causes of the crisis in the housing market. The aim of this law was to increase the supply of land and facilitate new construction, in order to reduce house prices. In the analysis we found that the negative effect on house prices as a consequence of the deregulation of land was strongly outweighed by the high demand for housing. Thus, the deregulation of land failed at reducing house prices. Instead, it allowed for construction to further increase, beyond sustainable levels.

Rental laws

Even though the rental laws of Franco were introduced several decades ago they might still have an effect on the Spanish housing market. In spite of the liberalization of these laws in 1985, incentivizing the supply of rental houses, the rental share continued to decrease towards 2000. The explanation might be that the mentality of owner-occupancy being the ideal living situation, promoted by Franco's regime, still had an influence on the Spanish society affecting both supply and demand. Alternatively the increased attractiveness of buying versus renting, with high deduction rates, low interest rates and lax lending conditions, has kept demand for rental houses low. Liberalizing rental laws in 1985 hoping to increase the rental share and at

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[119] Dynamic provisioning was introduced in Spain in order to counteract the pro-cyclicality in credit markets. Allthough they might have contributed to limit the credit growth to some extent, it was not sufficient in order counteract the extensive credit growth towards 2007. More information about this can be found in Lis and Herrero (2010).

the same time incentivizing owner-occupied housing through tax deductions, demonstrates the lack of consistency in Spanish housing policies.

After the housing boom (1997-2007), both land regulation and tax policies were revised in relation to the Law of a Sustainable Economy. Even though expectations are considered one of the most important drivers in the house price development, the significant increase of credit growth, low interest rates and lack of supervision of lending institutions coupled with higher tax deduction, might have kept demand at high levels, even in the presence of a housing bubble. Based on the findings in this thesis, we therefore suggest that the role of government policy, both during the dictatorship and in the late 1990s was quite significant for the house price development from 1997 and 2012.

5 Conclusion

The aim of this thesis is to determine the main drivers of the rise and fall in house pries in Spain between 1997 and 2012[120], and to determine to what extent the government has influenced this house price development. We use a theoretical framework presented by Poterba (1984), as well as the critique of the framework in a quantitative analysis of possible drivers of house prices in Spain in this period. When determining the importance of each driver, our results are related to empirical evidence provided by others.

We find that the price of land is the most important supply factor in the rise of house prices towards 2008. However, due to a possible reversed causality it has not been determined whether this factor has been a driver or whether it increased as a result of higher house prices. The particularly small rental share in Spain is also emphasized as a possible driver of house prices, but with no empirical evidence this cannot be verified. Our results suggest that demand factors such as disposable income, unemployment, interest rates, favorable tax policies for homeowners, and access to credit were important drivers of the surge in house prices towards 2008. However, the causality of all these drivers is uncertain with regard to the subsequent decline in house prices. A large share of the house price development cannot be attributed to fundamental values. We therefore suggest that the most important driver between 1997 and 2012 is the presence of irrational expectations. This factor can explain both the surge and fall in house prices.

Demand remained at high levels until 2007 in spite of an oversupply and increasing prices. After the decline in prices from 2008, demand for housing continued on a decreasing trend towards 2012. This underlines the importance of demand factors in the development of house prices and suggests a market failure in the Spanish housing market. Existing theories on speculative bubbles and empirical evidence from Spain suggest that consumers in the Spanish housing market are pro cyclical and shape their expectations based on momentum and productivity swings in the economy. Thus, the market failure can be explained by the speculative housing bubble caused by irrational expectations.

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[120] More spesifically between 2007 and the second quarter of 2012.

The government cannot directly control expectations, but expansionary policies can give a signal to the public that the economy will continue on an upward track. We find the influence of government policy to be important in the inflation of the housing bubble in Spain. In this thesis we emphasize how low interest rates after the entry into the EMU, and the introduction of more favorable tax policies for homeowners in 1998 have enabled people to pay high prices for housing even in the presence of a speculative bubble. Furthermore, a lack of lending restrictions for credit institutions, and a self-reinforcing effect between house prices and credit have enabled Spaniards to take on even bigger loans, incentivizing investment in houses.

Interest rates, tax policies and a self-reinforcing effect between house prices and credit, described above, are already emphasized in existing literature as factors that can create and further inflate housing bubbles. In this thesis we further suggest that the small rental share in Spain can also be a possible driver of the surge in prices towards 2008. This might be dated back to the dictatorship of Franco, when a mentality idealizing the homeowner was created. The strict rental laws introduced in this period have been revised, however, it seems like this mentality still remains. We therefore propose the idea that general attitudes favoring homeownership have contributed to further inflate the housing bubble. These attitudes might have incentivized Spaniards to choose homeownership regardless of the price of the house and the amount of debt they had to take on.

In 1997 Spanish land was deregulated with the aim of reducing the prices. However, the effect of increasing supply was strongly outweighed by higher levels of demand, partly caused by favorable tax policies, and a lack of supervision of credit institutions after entering the EMU. Thus, the government contributed to increase both supply and demand for housing. Consequently both house prices and construction increased, beyond sustainable levels. This shows that the failure of the housing policies might be related to their lack of consistency.

Lessons learned from Spain

The ongoing economic crisis in Spain demonstrates the importance of the housing market for the general economy. Relative to other countries, Spain has been particularly vulnerable with regard to the housing market. The entry into the EMU had a strong expansionary impact on

the Spanish economy and the government had no ability to change the interest rate in order to stabilize fluctuations. Moreover, the construction sector played an important role in the general economy both in terms of GDP as well as employment, and the owner-occupancy rate in Spain was one of the highest in Europe.

All of these factors can explain why the crisis in the Spanish housing market had such catastrophic consequences for the general economy. Nonetheless, many countries have the same characteristics as Spain with regard to the self-reinforcing effect between credit and house prices, the high share of household wealth invested in housing, and the high share of residential mortgages relative to GDP. Furthermore, considering that housing is a necessity for a well-functioning society, all countries are somehow exposed with regard to the housing market. Even though Spain was in a particularly vulnerable situation, the country's experiences the past 15 years serves as an example of the importance of monitoring the credit development and having prudent tax benefits for homeowners in order to avoid the creation of housing bubbles.

6 Appendices

Appendix 1: The Number of annual tax deductions (million deductions) (1983-2010)[121]
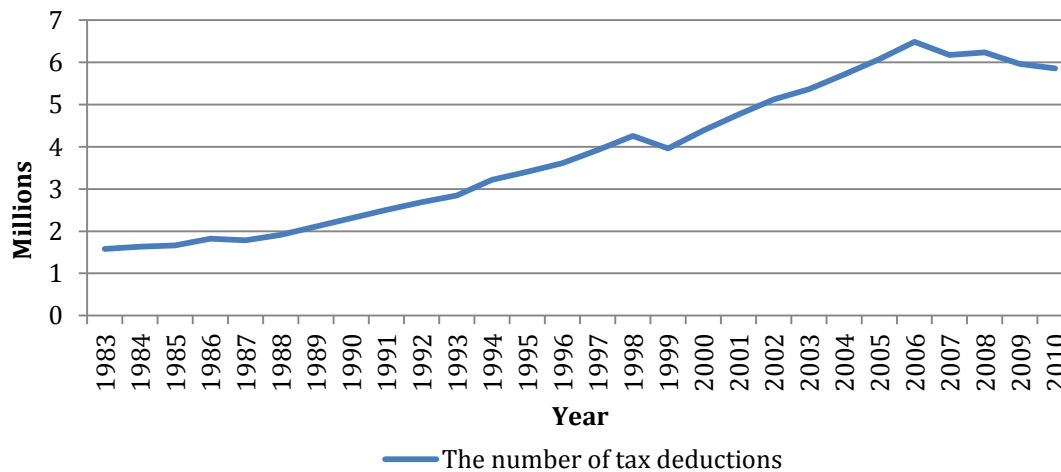
Appendix 2: Monthly Spanish Consumer Confidence Index (0 = maximum pessimism, 50 =neutral, 100 = Maximum optimism) (2004-2012)[122]
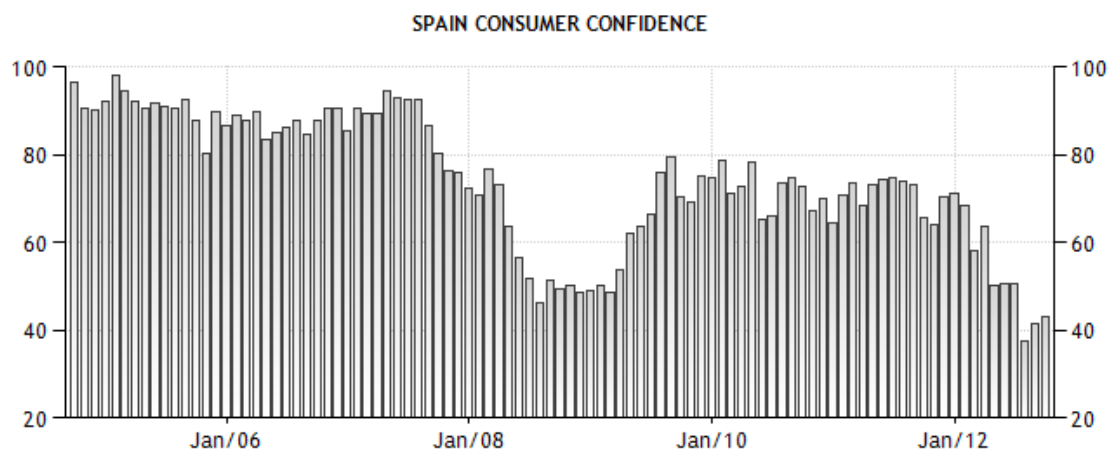
"ICC has been carried out by the Official Credit Institute (Instituto de Crédito Oficial) between 2004 and 2011. From November 2011 ICC is conducted by the Center of Sociological Research (el Centro de Investigaciones Sociológicas). The indicator is based on

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[121] BADESPE(2012)
[122] Trading Economics (2012)

a monthly telephone survey carried out by IPSOS Spain on a sample of 1,000 people aged over 16 who are representative of Spanish society as a whole." (Trading Economics, 2012). A consumer confidence of 100 represents maximum optimism, 0 is maximum pessimism and 50 represents neutrality.

Appendix 3: Rental share in Spain (2006-2010)[123]

	Owner-occupied	Rental	Other	Total
2006	81.3	13.6	5.1	100
2007	81.2	13.8	4.9	100
2008	80.4	14.5	5.1	100
2009	79.4	15.6	5.1	100
2010	78.4	16.1	5.5	100

[123] INE (2012c)

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