MORTGAGE SYSTEMS AND THE ADAPTATION OF MORTGAGE SYSTEM IN TURKEY: ANALYZING THE HOUSING LOANS

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ABSTRACT

MORTGAGE SYSTEMS AND THE ADAPTATION OF MORTGAGE SYSTEM IN TURKEY: ANALYZING THE HOUSING LOANS

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An efficient housing finance system has significant importance both in meeting the housing needs of individuals and in reinforcing the development of the construction, finance and other related sectors of an economy. Today, developed countries have advanced housing finance systems in which funds flow from savers to home-buyers by the mortgage markets. On the other hand, despite its recognized economic and social importance, housing finance often remains under-developed in developing countries mainly due to the lack of macroeconomic stability. Turkey, being a developing country, has made an important step towards the development of a mortgage system with the passage of the new Mortgage Law by the Parliament. Accordingly, the purpose of this thesis is to examine the applicability of mortgage system in Turkey. For this purpose, housing finance systems of some developed and developing countries are reviewed, and the housing finance system in Turkey is explained. Further, causality between the total amount of housing loans issued, inflation and nominal interest rates in Turkey is analyzed with the Toda-Yamamoto VAR approach. VAR analysis shows the negative impact of nominal interest rates on the total amount of housing loans issued in Turkey. To sum up, considering its

economic and social environment, Turkey has adapted best international experiences, and it is possible for a mortgage system to develop in the country by the new mortgage legislation combined with the lower interest rates as inflation declines.

Keywords: Housing finance, mortgage, mortgage markets, Toda-Yamamoto, VAR

ÖZ

MORTGAGE SİSTEMLERİ VE MORTGAGE SİSTEMİNİN TÜRKİYE'YE UYARLAMASI: KONUT KREDİLERİNİN ANALİZİ

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Etkili bir konut finansman sistemi hem bireylerin konut ihtiyacının karşılanması hem de inşaat, finans ve ekonominin diğer ilgili sektörlerinin gelişiminin pekiştirilmesi açısından çok önemlidir. Bugün, gelişmiş ülkelerin ileri konut finansman sistemleri vardır ve finansman fonları mortgage piyasaları aracılığıyla tasarruf sahiplerinden konut alıcılarına aktarılmaktadır. Diğer taraftan, gelişmekte olan ülkelerde, konut finansmanı, genel kabul görmüş ekonomik ve sosyal önemine rağmen, temelde makro ekonomik dengenin eksikliğinden dolayı, genellikle az gelişmiştir. Gelişmekte olan bir ülke olan Türkiye, yeni mortgage yasasının kabul edilmesiyle birlikte, mortgage sisteminin oluşturulması yönünde önemli bir adım atmıştır. Dolayısıyla, bu tezin amacı, mortgage sisteminin Türkiye'de uygulanabilirliğini incelemektir. Bu nedenle, gelişmiş ve gelişmekte olan bazı ülkelerin konut finansman sistemleri tekrar edilmiş ve Türkiye'deki konut finansman sistemi açıklanmıştır. İlave olarak, Türkiye'deki, verilen toplam konut kredileri, enflasyon ve nominal faiz oranları arasındaki nedensellik ilişkisi Toda-Yamamoto VAR yaklaşımına göre incelenmiştir. VAR analizi, nominal faiz oranlarının verilen toplam konut kredileri üzerindeki negatif etkisini göstermiştir.

Sonuç olarak, Türkiye, kendi ekonomik ve sosyal çevresini dikkate alarak, en iyi uluslararası deneyimleri uyarlamıştır ve yeni mortgage yasasının, enflasyon düştükçe azalan faiz oranlarıyla birleşmesiyle birlikte, ülkede bir mortgage sisteminin gelişimi mümkündür.

Anahtar kelimeler: Konut finansmanı, mortgage, mortgage piyasaları, Toda-Yamamoto, VAR

To My Family

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

An efficient housing finance system has significant importance both in meeting the housing needs of individuals and in reinforcing the development of the construction, finance and other related sectors of an economy. International experience suggests that, the widespread availability of residential mortgages has favorable impact on poverty alleviation, quality of housing, infrastructure, and urbanization (Erbaş and Nothaft, 2005).

Today, developed countries have advanced housing finance systems in which funds flow from people with fund surpluses to the ones that are in need of them by the aid of mortgage markets. On the other hand, despite its recognized economic and social importance, housing finance often remains under-developed in developing countries mainly due to the lack of macroeconomic stability.

Turkey, being one of the developing countries, has been facing housing shortages since the 1950s, and the country still lacks a well-functioning housing finance system. As a matter of fact, housing is a problematic issue for Turkey. The demand for housing is increasing due to young population growth and family size reductions. As marriages increase between young people, and as families get smaller, the need for new housing becomes more apparent. In addition, migration from rural areas to large cities accelerates urbanization, and the demand for housing in urban cities gets harder to meet.

Moreover, Turkey's housing sector consists of unauthorized housing added to its unplanned and unhealthy urbanization. Akın (2008) states that, in Turkey, public

sector and financial institutions that use mortgage markets have been unable to facilitate affordable housing due to unfavorable macroeconomic climate resulting from high inflation and high interest rates, and lack of institutional infrastructure. Therefore, the demand for housing in Turkey has been met by the construction of unauthorized dwellings in squatter settlements.

An important step has been made towards the development of an advanced housing finance system that is the mortgage system with the passage of the new Mortgage Law by the Parliament as of February 21, 2007 in Turkey. Accordingly, the purpose of this thesis is to examine the applicability of mortgage system in Turkey. For this purpose, mortgage systems of some developed and developing countries are reviewed, and the housing finance system in Turkey is explained. Furthermore, the causality between inflation, nominal interest rates and the total amount of housing loans issued in Turkey is investigated empirically by the Toda-Yamamoto (1995) VAR approach.

It is important to see the relationships of inflation, nominal interest rates and the total amount of housing loans issued in Turkey, because as inflation declines long-term investment in the Turkish financial markets would get possible, and the availability of long-term funds for issuing housing loans would increase. Currently, Treasury bills dominate the capital market of Turkey, and commercial banks have limited access to capital due to the crowding-out effect of the public sector borrowings with the Treasury bills. As inflation declines, poor market confidence and crowding out caused by the Turkish Treasury would decrease, and it would get easier for commercial banks to access capital to fund their housing loans. Further, commercial banks in Turkey are faced with the maturity mismatch problem, because they currently fund the housing loans from their deposit base. In other words, the deposit financing route is used in the institutional housing finance system of Turkey. Karakaş and Özsan (2005) stated that, the average term of savings deposits is less than two months whereas mortgages should be long term

such as between 15 to 30 years. So in this situation, for instance mortgages with even 5 to 8 years maturity create an enormous amount of risk load on bank's balance sheets. This prevents the issuance of mortgages. For instance, today lenders do not extend housing loans to low and middle income people who have high default risks, because commercial banks are faced with the maturity mismatch problem and they don't have means to hedge this risk. However, as inflation declines, long term investment would get possible and funding would be eased, and accordingly maturity mismatch problem would be reduced and the total amount of housing loans issued by commercial banks would increase. Then, it would get possible for commercial banks to create mortgage portfolios, if at the same time, standardization of housing loans, mortgage specialization, and a standardized appraisal system is achieved. After that, as stated by Karakaş and Özsan (2005), if outstanding mortgage portfolios reach a sufficient level of quality and magnitude, then commercial banks in Turkey could issue mortgage bonds as the government's domestic debt requirement is expected to diminish.

The literature about mortgage markets agrees upon the fact that macroeconomic instability is one of the main inhibiting factors on the growth of mortgages. Macroeconomic stability is a must for a mortgage market to develop and to grow. High nominal interest rates negatively affect the demand for housing loans by the house purchasers. There are other factors that affect the demand for housing and the demand for housing loans such as increases in population, number of households, income level, employment rate, and house prices. However, rises in inflation and accordingly in interest rates creates an instable macroeconomic environment which negatively affects the number of housing loans issued both due to the high cost for the borrowers and low availability of funds for lenders in such a situation.

Existing studies about housing finance are mainly descriptive and highly informative. For instance, the study by Boleat (1985) provides a broad view of a range of housing finance systems used in developed and developing countries.

Housing finance systems in specific countries are described separately in the author's book. Green and Wachter (2005) describes the historical evolution of the American mortgages, compares the structure of American residential mortgages with those in other countries and talks about the future of the American mortgage. The study of Wyman (2003) provides a comparative analysis of mortgage markets across Europe using a number of consistent indicators to compare price and cost levels, product ranges and profitability. In addition, the study evaluates the benefits that could be derived from the greater financial integration of mortgage markets in Europe. Diamond and Lea (1992) investigates the special circuits, which are created by governments to fund flows, in five developed countries that are Denmark, France, Germany, United Kingdom and United States. The authors discuss the evolution of these circuits in the 1980s and the decline of these circuits with the move towards integration of housing finance with capital markets. Boleat (2008) provides a comprehensive description of the housing market in Britain. Lea (1994) explains the concept and types of secondary mortgage markets, reviews the experience with secondary mortgage markets in developed countries and assesses the applicability of secondary mortgage markets in developing countries. Chiquier et.al (2004) reviews the experience of introducing mortgage securities in emerging markets and summarizes the lessons learned from these experiences. Renaud (2005) tries to designate the important structural differences between developed and developing economies in terms of their mortgage finance systems.

As an example to the studies that use empirical analyses, Warnock and Warnock (2008) analyzes the determinants of the extent of housing finance emprically with a regression analysis in a sample of 62 countries that includes both developed and a wide range of developing countries. Also, Wolswijk (2005) investigates the fiscal aspects of mortgage debt in the European Union (EU). The paper includes an empirical part in which real mortgage debt growth is analyzed for 15 EU countries using pooled regressions. Hillebrand and Koray (2008) analyze empirically the relationship between residential mortgages and volatility in mortgage rates for the

period 1971:02 through 2003:03 in the United States. Tsatsaronis and Zhu (2004) use a common empirical framework to analyze the main forces that drive aggregate house prices across a number of developed countries.

Considering Turkey, the studies on the housing finance system of the country are also mainly descriptive and highly informative, with less formal empirical analysis (see Karakaş and Özsan, 2005; Özsan and Karakaş, 2005; Gürbüz, 2002; Akçay, 2003; Alp, 2000; Alp and Yılmaz, 2000; Aydın, 2006; Uludağ, 1997; Teker, 2000; Demir and Palabıyık, 2005; Berberoğlu and Teker, 2005). In terms of empirical studies, Binay and Salman (2008) uses simulations in their study and they argue that the first comprehensive study on real estate markets in Turkey is their study which discusses issues of real estate price bubble, the extent of wealth effects, affordability, financial deepening and credit market risks. Their simulations indicate that given current wealth levels, cost of credit and maturity, average homes are not affordable by average consumers. The market requires further reduction in the cost of credit and extension of maturity to manage a significant demand shift in the real estate market. Akın (2008) reviews comprehensively the housing market characteristics between 1987 and 2006 in Turkey, and on the basis of these characteristics, the paper develops an estimation of quarterly housing wealth series. Eryiğit (2008) gives empirical evidence by simple linear regression approach that there is negative linear relationship between the amount of housing loans used and the housing expenditure index in Turkey.

This thesis summarizes comprehensively the concepts of mortgage systems, provides a review of mortgage systems from some developed and developing countries, and describes the situation of the housing finance system in Turkey. Mortgage system is relatively a new concept for Turkey, and it is important that the terms about this system and the experience of some other countries with this system are well understood. It is important to see the overall picture of the housing finance system in Turkey and provide some future prospects. On the other hand, the studies

about the housing finance system of Turkey are rather informative and lack any formal empirical analysis. This is mainly due to the lack of data about the system. For instance, there is no readily available house price data in Turkey. This study is different, because it empirically shows the relationships of inflation, nominal interest rates and the total amount of housing loans issued in Turkey. It is important to see the causality between the total amount of housing loans issued, inflation and interest rates in Turkey, because high inflation rates and accompanied high nominal interest rates affects both the availability of funds for housing loans and the cost of the loan for the borrower, and a well-functioning institutional housing finance system cannot be established without the significant issuance of housing loans.

The following chapter, chapter 2 describes the types of housing finance systems in general. Chapter 3 defines the terms about the mortgage systems. Chapter 4 gives examples of mortgage systems from some developed and developing countries. Then, chapter 5 first explains the socio-economic and macroeconomic structure of Turkey, secondly describes the housing finance system in Turkey by giving the general structure of the housing finance in the country, and lastly investigates the adaptation of mortgage system in Turkey in the context of the new Mortgage Law passed through the Parliament. After that, chapter 6 contains the empirical analysis on the relationships of inflation, nominal interest rates and the total amount of housing loans issued in Turkey. Finally, chapter 7 concludes the thesis by giving the general summary and discussions of the whole study.

CHAPTER 2

HOUSING FINANCE SYSTEMS

Housing finance is basically the process of gathering funds to use in the purchase of houses. Due to this fact, housing finance methods are designed to provide the transfer of funds from people without productive investment opportunities to the ones who have.

A sign of financial sector development is the funding of owner-occupied housing by formal financial institutions as contrasted with informal funding from relatives or landlords. These institutions can be private sector entities or mutual organizations or special circuits. As economies develop, provision of housing finance often moves away from extensive reliance on special circuits towards integration of housing finance into the broader financial markets (Lea, 1994).

According to Boleat (1985), there are four main types of housing finance systems as the direct route, the contractual route, the deposit financing route, and the mortgage bank-secondary mortgage market route.

2.1 The Direct Route

In this method of housing finance, funds are directly obtained from people with fund surpluses. In other words, financial intermediation is not used in the direct route and therefore it is an informal way of housing finance. Usually fund suppliers are relatives or friends of the households. In some cases, households borrow some money to add to their own savings in order to purchase a house.

It is clear that this method is an ineffective method of obtaining funds due to the lack of financial intermediation. Financial intermediaries are important because they reduce transaction costs through their expertise and economies of scale, reduce the exposure of investors to risk through diversification and solve information problems. Nevertheless, in the absence of any alternative, the direct route is one which is used in less developed countries and also in the more developed countries by those who are not able to use established financial mechanisms (Mishkin and Eakins, 2009; Boleat, 1985).

2.2 The Contractual Route

The contractual method is a formal way of housing finance which provides funds for the part of the housing purchase. In this system, investors invest their money to special institutions which use formal contractual systems at an interest rate below the market level. Then, these investors are allowed to take a loan again at an interest rate lower than the market rate. Hence, in this method the savings of people for a period of years supplies low cost funds for the others in the system.

2.3 The Deposit Financing Route

The deposit financing route is the formal way of giving loans by the deposit taking institutions. In this system, savings of households deposited in financial institutions are transferred to homebuyers as loans by the aid of financial intermediation.

There are several types of deposit taking institutions, including commercial banks which offer a complete range of banking services, savings banks which deal largely with the household sector, and specialist housing finance institutions (building societies in United Kingdom or savings and loan associations in the United States)

which focus their lending primarily on housing (Lea, 1994). All of these institutions operate by raising deposits and then lending these deposits in a variety of ways. The important point is that the deposit taking comes first and then the institution has to decide what to do with the funds. This means that housing loans may be competing with loans for other purposes and if the interest rate is not at an appropriate market level, then shortages may well occur (Boleat, 1985).

According to Lea (1994), the deposit financing route can be referred to as a retail approach, because in this system institutions deal directly with the public in their fund borrowing and fund lending processes.

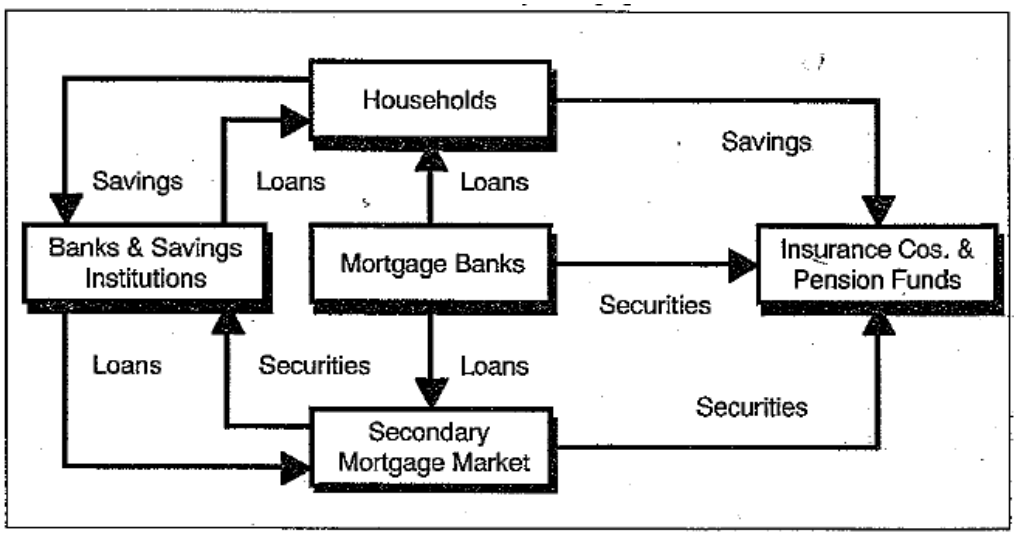
2.4 The Mortgage Bank - Secondary Mortgage Market Route

Mortgage bank system is a formal method of housing finance which is largely used by developed countries. In this system, a specialized institution called the mortgage bank grants loans to house buyers and funds these loans by selling the securities that they issue in the capital markets. As a matter of fact, this system requires well-functioning capital markets. The securities are the liabilities of the mortgage bank and the main purchasers of the securities are the financial institutions with long-term sources of funds.

Lea (1994) stated that, the mortgage bank system is the combination of retail and wholesale approaches. Its wholesale character comes from its way of fund raising as funds are obtained primarily from institutional sources through the capital markets rather than directly from the public. In other words, mortgage banks are not entailed to collect deposits in order to grant mortgage credits.

A changed form of the mortgage bank system is the secondary mortgage market approach. In a secondary mortgage market, mortgages are sold to an institutional

investor, having previously insured them or obtained a government guarantee. In this case the mortgage bank just grants and services the loans and then it sells the loans to investors instead of raising funds from them (Boleat, 1985). Figure 2.1 below shows the housing finance system with a secondary mortgage market route.



Source: Lea, 1994.

Figure 2.1 Housing Finance with a Secondary Mortgage Market

CHAPTER 3

MORTGAGE SYSTEMS

In this chapter, after the explanation of the types of housing finance systems, the terms about the mortgage system, which is the most advanced type of housing finance systems, is explained. Mortgage system is used mainly in developed countries, which includes mortgage banks or secondary mortgage markets. A properly structured mortgage market can provide significant benefits. It increases availability of funds for housing, decreases cost of mortgages through a more efficient allocation of risk, economies of scale and improved competition, and improves affordability of housing finance for borrowers through lower rates, longer maturities and alternative mortgage types. So, it is important that the terms about this well-functioning housing finance system to be well understood.

3.1 Mortgages and Mortgage Markets

A **mortgage** is a long-term loan secured by the collateral of some specified real estate property. In other words, it is an agreement that the property will be sold by the lender if the debt is not paid by the borrower through a series of payments as agreed (Mishkin and Eakins, 2009; Fraser, Gup, and Kolari, 1995; Fabozzi, 2001). The term mortgage comes from the Old French, and it literally means **death vow**. This refers not to the death of the borrower, but to the "death" of the loan (McDonald and Thornton, 2008). "Death" of the loan means that the payments of the mortgages are completed at their fixed time to maturity.

First examples of mortgages were used in the England at the beginning of the 1190s

and then they came into use in the Europe. At that time, when lenders gave credit for the purchase of a house, they also transferred the title of the property to themselves in order to guarantee their payment by selling the house if the borrower defaulted on the loan. Then, at the beginning of the 19th century, mortgage system started to spread throughout the United States (US) due to the migration from Europe. Today, US have the most developed secondary mortgage market.

Mortgages can be used to finance both residential and nonresidential properties. For example, a family can purchase a home with a mortgage financing. This is a residential property and it can be financed with a mortgage. On the other hand, the construction of nonresidential properties such as an office building or a hotel can also be financed with a mortgage. In either case, the loan is amortized which means that the borrower pays off the loan over time in some combination of principal and interest payments that results in full payment of the debt by maturity (Mishkin and Eakins, 2009).

The interest rate that borrowers pay the lenders in exchange for having the money today is a very important factor when borrowers make their decisions about which mortgage to obtain. Additionally, mortgage contracts are detailed documents that contain several financial and legal terms to mitigate the possible risks that can be faced by mortgage lenders. One of them is the lien that is placed against the real estate property. Another one is the down payment that necessitates the borrower to pay a part of the purchase price. Borrowers should also qualify for the mortgage and be ready to buy private mortgage insurance as a guarantee for a case of a default.

On the other hand, the term **mortgage market** refers to a place where people can borrow funds to finance their real estate property. A mortgage market consists of group of institutions and individuals who are involved with mortgage finance in one way or another (McDonald and Thornton, 2008). A mortgage market can also be separated into two as the primary mortgage market and the secondary mortgage

market. Primary mortgage market is the one where new mortgages are sold for the first time. In a secondary mortgage market, existing mortgages are traded. According to Fabozzi (2001), primary market provides the actual loan to a borrower, whereas the secondary market channels liquidity into the primary market by way of purchasing packages of loans from lenders.

A mortgage market involves many participants and according to Fabozzi (2001), the industry can be categorized into four groups as mortgage originators, mortgage servicers, mortgage insurers and mortgage investors. A mortgage originator is the original lender of the mortgage. Commercial banks, thrift institutions, mortgage banks, life insurance companies, pension funds are the mortgage originators. After a mortgage is granted, a mortgage originator can hold the mortgage in its portfolio, sell the mortgage to an investor who will either hold the mortgage or who will add the mortgage in a pool of mortgages to be used as collateral for the issuance of mortgage-backed security, or use the mortgage as collateral for its own issuance of a mortgage-backed security (Fabozzi, 2001).

Many mortgage originators are also mortgage servicers, and mortgage servicers are the ones who complete the loan-servicing job in return for a servicing fee (a certain percentage of the total loan amount). The loan-servicing agent; 1) collects payments from the borrower, 2) passes the principal and interest on to the investor, 3) keeps required records of the transaction, and 4) maintains reserve accounts for tax and insurance payments on behalf of the borrower (Mishkin and Eakins, 2009).

Another group is the mortgage insurers who are the ones that provide insurance for the loan to protect the lenders.

Finally, mortgage investors are the government sponsored enterprises or several private companies or investors who purchase mortgages from mortgage originators, and the ones with fund surpluses who invest in mortgage-backed securities.

3.2 Types of Mortgages

There a number of types of mortgages available in the market (Mishkin and Eakins, 2009). Fixed rate, fully amortized, level payment mortgages are the predominant form of financing residential properties (Fraser, Gup, and Kolari, 1995). Alternative mortgage instruments are mortgages other than the standard, fixed-rate, 30-year, amortizing loans (Clauretie and Webb, 1993).

In this section, types of mortgages will be explained under three different classifications as insured and conventional mortgages, fixed and adjustable rate mortgages, and other types of mortgages. Other types of mortgages that will be discussed here, which are the principal types of alternative mortgage instruments, includes the following: graduated payment mortgages (GPMs), growing equity mortgages (GEMs), shared appreciation mortgages (SAMs), equity participation mortgages, second mortgages, reverse annuity mortgages (RAMs), and price level adjusted mortgages (PLAMs) (Mishkin and Eakins, 2009).

3.2.1 Insured and Conventional Mortgages

One classification of mortgages can be made as insured mortgages and conventional mortgages. Insured mortgages are originated by banks or other mortgage lenders but are guaranteed by either the Federal Housing Administration (FHA) or the Veterans Administration (VA). Applicants for FHA and VA loans must meet certain qualifications, such as having served in the military or having income below a given level, and can borrow only up to a certain amount. One important advantage to a borrower who qualifies for an FHA or VA loan is that only a very low or zero down payments is required (Mishkin and Eakins, 2009).

On the other hand, conventional mortgages are originated by the same sources as

insured loans but are not guaranteed. Therefore, most lenders require the borrower to obtain private mortgage insurance on all loans with a loan-to-value ratio exceeding 80 percent (Mishkin and Eakins, 2009).

3.2.2 Fixed and Adjustable Rate Mortgages

As Mishkin and Eakins (2009) state, in standard mortgage contracts, borrowers agree to make regular payments on the principal and interest they owe to lenders. In fixed rate mortgages (FRMs), the interest-rate and the monthly payment do not vary over the life of the mortgage.

On the other hand, adjustable rate mortgages (ARMs) differ from fixed rate mortgages in that they are designed to adjust in one or more ways to changes in economic conditions (Brueggeman and Fisher, 2008). An ARM is a type of mortgage in which the interest rate adjusts periodically according to a previously determined index, such as Treasury bill rates, and a margin. This adjustment results in the mortgage payment either increasing or decreasing. Limits, called caps, can be set on the amount by which interest rates or payments can change (Clauretie and Webb, 1993).

Mishkin and Eakins (2009) stated that, borrowers tend to prefer fixed-rate loans to ARMs because ARMs may cause financial hardship for them if interest rates rise. However, fixed-rate borrowers do not benefit if rates fall unless they are willing to refinance. Lenders, by contrast, prefer ARMs because ARMs lessen interest rate risk. Because lenders prefer ARMs and borrowers prefer FRMs, lenders must attract borrowers by offering lower initial rates (teaser rates) on ARMs than on FRMs.

Another characteristic of an ARM is negative amortization. To the extent the interest in a given period exceeds the periodic payment; the difference in interest

may be compounded at current rates and added to the outstanding loan balance. When additions to the outstanding loan balance are allowed in the loan agreement, such amounts are referred to as negative amortization. Moreover, an ARM borrower has a right to convert to a FRM. Depending on the agreement, this conversion option may be exercised by the borrower at will or only after a specific period of time. Lenders also may charge a fee for this option.

3.2.3 Graduated Payment Mortgages

Graduated payment mortgages (GPM) are created by lenders in order to deal with the problem of inflation and its impact on mortgage interest rates and monthly payments. In a GPM, mortgage payments are lower than they would be with a standard mortgage loan in the initial years of the loan. Because borrower incomes are expected to rise over time, the payments in GPM gradually increase at a previously determined rate. With a GPM, it is possible reduce the tilt effect to some extent by diminishing the burden faced by households when paying their mortgage payments from their current income in an inflationary environment (Brueggeman and Fisher, 2008).

The advantage of the GPM is that borrowers will qualify for a larger loan than if they requested a standard mortgage loan. On the other hand, the disadvantage is that payments rise whether the borrower's income does or not (Mishkin and Eakins, 2009). Negative amortization occurs in this type of mortgages because the initial monthly payments are very low in GPMs.

3.2.4 Growing Equity Mortgages

Growing equity mortgage (GEM) is a type of mortgage in which annual increases in

monthly payments are used to reduce the outstanding loan balance and shorten the term of the loan (Clauretie and Webb, 1993).

Mishkin and Eakins (2009) gave an example about GEMs. For example, a typical contract may call for fixed payments for the first two years. The payments may increase by 5 percent per year for the next five years, and then remain the same until maturity. The result is to reduce the life of the loan from 30 years to about 17.

GEMs are popular among borrowers who expect their incomes to rise in the future. It gives them the benefit of a small payment at the beginning while still paying back the loan balance early. Although the increase in payment is required in GEMs, most mortgages have no prepayment penalty (Mishkin and Eakins, 2009). Annual increases in the monthly payments go to reduce the principal balance of the loan.

3.2.5 Shared Appreciation Mortgages

In a shared appreciation mortgage (SAM) agreement, borrower agrees to share in the increased value of the property (usually 30 percent to 50 percent) with the lender in return for a reduction in the fixed interest rate at the time the loan is made. The increased value of the property is decided at the time the property is sold. Loan agreement does not include sharing a decline in value (Fraser, Gup, and Kolari, 1995).

Mishkin and Eakins (2009) stated that lenders had created the SAMs to help borrowers qualify and to keep loan volume high when interest rates are high. When interest rates are high, the monthly payments on mortgages are also high, and this prevents many borrowers from qualifying for loans. The authors added that, as interest rates and inflation fell in the late 1980s and into the 1990s in the US, the popularity of these loans also diminished.

3.2.6 Equity Participation Mortgages

An equity participation mortgage is different from a shared appreciation mortgage in the way that in a shared appreciation mortgage, the lender shares in the appreciation of the property, whereas in an equity participation mortgage, an outside investor rather than the lender shares in the appreciation of the property. This third-party investor will either provide a portion of the purchase price of the property or supplement the monthly payments. In return, the investor receives a portion of any appreciation in the property (Mishkin and Eakins, 2009).

The benefit for the borrower in this type of loan is similar to the shared appreciation mortgage that is the borrower gets able to qualify for a larger loan than without such help (Mishkin and Eakins, 2009).

3.2.7 Second Mortgages

A second mortgage is a type of mortgage that is made in addition to the first mortgage and that uses the same property as collateral. Second mortgages are usually used by homeowners when they need funds for business or some other purpose. Second mortgages usually have short maturities, like 3 to 5 years, but some have maturities of 12 years or more. In foreclosure, second mortgages have a subordinated claim to property (Fraser, Gup, and Kolari, 1995). This means that if a default occurs, the second mortgage holder will be paid only after the original loan has been paid off and if sufficient funds still remain (Mishkin and Eakins, 2009).

One purpose of second mortgages is to give borrowers a way to use the equity they have in their homes as security for another loan as stated above. Another purpose of the second mortgage is to take the advantage of tax deductions. The interest on mortgages is tax deductible in the US. No other kind of consumer loan has this tax

deduction (Mishkin and Eakins, 2009).

Another version of a second mortgage is a wraparound mortgage. Wraparound mortgage emerges when a house is sold. In a wraparound mortgage, the new loan includes the first mortgage and a second mortgage is 'wrapped around' the first mortgage. Generally, the second mortgage has a higher interest rate and longer maturity than the first mortgage. Under a wraparound plan, the lender often assumes the payments on the existing mortgage, and then issues another mortgage to the new buyer. The lender's profit comes from the difference between the two rates. In addition, the potential gain from the sale of the financed property is also a source of profit for the lender (Fraser, Gup, and Kolari, 1995).

3.2.8 Reverse Annuity Mortgages

Reverse annuity mortgage (RAM) is a financing arrangement where a lender pays the borrower a fixed periodic payment based on a percentage of the property's value (Clauretie and Webb, 1993). RAM is designed for retired people who own their houses and want to increase their incomes by borrowing against the equity in their houses. In this case, the lender pays the property owner a fixed annuity based on a percentage value of the property. The owner would not be required to repay the loan until his or her demise, at which time the loan would be paid from the proceeds of the estate, or until the house is sold. The interest rate on the loan may be adjustable and the loan may have a refinancing option (Fraser, Gup, and Kolari, 1995).

3.2.9 Price Level Adjusted Mortgages

Price level adjusted mortgage (PLAM) is an alternative mortgage instrument that provides the lender with a real rate of interest in the form of a contract rate and

inflation premium through an adjustment of the mortgage balance by the most recent amount of inflation (Clauretie and Webb, 1993).

The determinants of mortgage interest rates are expected rate of real interest, risk premium, and expected inflation. Among these variables, expected inflation is the most difficult one to predict. Lenders originate mortgages at interest rates that include expectations for the real interest rate plus a risk premium for the likelihood of loss due to default on the mortgage (Brueggeman and Fisher, 2008).

In a PLAM, after estimating initial values of the real interest rate and a risk premium, the loan balance would be adjusted up or down by a price index. Payments would then be based on a new loan balance that is adjusted for inflation. This would shift the risk of changes in market interest rates caused by inflation to borrowers and relieve lenders of the difficult task of forecasting future inflation, because the payments on a PLAM would be based on an interest rate that includes only anticipations for the real interest rate and a risk premium, but they would be adjusted periodically based on the inflation adjusted new loan balance (Brueggeman and Fisher, 2008).

Clauretie and Webb (1993) stated that, the low interest rate in PLAMs makes the loan more affordable for the borrowers. Because inflation need not be anticipated with the PLAM, there is no tilt effect. The borrower only pays the inflation premium through an upward adjustment of the loan balance after the inflation has occurred.

However, it should also be noted here that the increase in the borrower's income should be approximately same with the increase in the rate of inflation. On the other hand, one drawback of the PLAM besides its complexity is the negative amortization included in the loan. Negative amortization occurs through the adjustment of the balance for recent inflation (Clauretie and Webb, 1993).

3.3 Subprime Mortgages

Subprime mortgages are mortgages that are made to borrowers who don't qualify for loans at the usual market interest rate either because of a poor credit rating or because of their demand of a loan that is larger than the one justified by their income (Mishkin and Eakins, 2009).

Laderman (2001) stated that, subprime mortgages are typically made to borrowers with high credit risk, that is, the risk that the borrower will not fully repay the lender. A borrower presents a high level of credit risk when the borrower's credit history is impaired or not very long, or when the borrower carries a large amount of debt relative to income. Credit scoring models statistically analyze the historical relationships between these characteristics and defaults. According to data from the Mortgage Information Corporation (MIC) that shows Fair Isaac Company (FICO) credit scores of borrowers whose loans were included in secondary market mortgage pools, the average score for borrowers in subprime pools was 605, where the same score was 721 for the lower risk, prime mortgage borrowers (in the FICO system, scores of 620 or below represent unacceptable levels of credit risk for lenders in the prime mortgage market).

To compensate for the added credit risk, lenders tend to charge much higher interest rates and fees on subprime loans than on prime mortgages. Subprime loan contracts are also more likely to include penalties associated with the prepayment risk. The risk of prepayment is probably higher in the subprime mortgage market than in the prime mortgage market, due to the greater scope for improvements in the borrower's financial condition that make it advantageous for the borrower to prepay (Laderman, 2001).

Subprime mortgages tend to have other characteristics besides being generally risky. It appears that most are not mortgages for purchasing a home but are, rather,

home equity loans. Home equity may serve as a financial reserve that can be used as needed at a lower cost than most other forms of credit. Subprime mortgages also tend to be first lien loans, meaning that the first mortgage has been paid off and the subprime lender has the first claim to the home over any other lenders should the borrower default (Laderman, 2001).

Bernanke (2007) stated that, having emerged more than two decades ago, subprime mortgage lending began to expand seriously in the mid-1990s in the US, and the expansion fostered in large part by innovations that reduced the costs for lenders of assessing and pricing risks. The expansion of subprime mortgage lending has made homeownership possible for households that in the past might not have qualified for a mortgage and has thereby contributed to the rise in the homeownership rate since the mid-1990s in the US.

3.4 Risks Involved in Mortgages

Lenders and investors of mortgages are concerned about various risks undertaken when making loans and investments, in addition to expected inflation. They are concerned about whether interest rates and returns available on mortgages compensate adequately for risk (Brueggeman and Fisher, 2008).

In this section, four main risks that are the default risk, the interest rate risk, the prepayment risk, and the liquidity risk which are affecting mortgages will be explained.

3.4.1 Default Risk

Default risk can be defined as the risk that borrowers will default on obligations to

repay interest and principal. It varies with the nature of the loan and the creditworthiness of individual borrowers. The possibility of default by a borrower means that, lenders must charge a premium, or higher rate of interest, to offset possible loan losses (Brueggeman and Fisher, 2008).

The likelihood that a borrower's income may fall after a loan is made and accordingly the receipt of future mortgage payments gets risky is the situation of default risk. Similarly, loan balance could get higher than a property's value at some future time and that can make the borrower default on payments (Brueggeman and Fisher, 2008).

3.4.2 Interest Rate Risk

Investors and lenders could also face with the risk that the interest rate charged on a particular loan gets insufficient when there is a large change in the economic conditions after a loan is made. The magnitude of these changes may have necessitated a higher interest rate when the loan was made. Therefore, interest rate risk can be defined as the uncertainty about what interest rate to charge when a loan is made. The possibility that too low an interest rate was charged at the time the loan was made is a major source of risk to the lender. Hence, a premium for this risk must also be charged or reflected in the market rate of interest. Interest rate risk affects mainly the fixed-rate mortgages. Adjustable rate mortgages are designed to reduce the interest rate risk for the lenders (Brueggeman and Fisher, 2008).

As an example, Chiquier et.al (2004) stated that, savings and loan associations in the United States (US) had faced with substantial interest rate risk associated with making long-term fixed rate mortgages funded by short term deposits. While adjustable rate mortgages reduce the interest rate risk for lenders, they increase it for borrowers, which may lead to high default by borrowers in volatile economies.

3.4.3 Prepayment Risk

Homeowners have the option to prepay their mortgage in whole or in part at any time they want. Typically, a penalty is not imposed on the homeowner for prepaying the mortgage unless it is stated contractually. Hence, an investor in a mortgage cannot be certain of the cash flow because of the prepayment option granted to the homeowner. The uncertainty about the cash flow due to the prepayment option is called as the prepayment risk. An investor is exposed to prepayment risk for an individual mortgage and for a pool of mortgages. Consequently any security backed by a pool of mortgages exposes an investor to prepayment risk (Fabozzi, 2001).

One of the reasons why a homeowner wants to prepay the loan is the decline of the current mortgage rate by a sufficient amount below the contract rate. If loans are prepaid when interest rates fall, lenders must forgo the opportunity to earn interest income that would have been earned at the original contract rate. As funds from the prepaid loans are reinvested by lenders, a lower rate of interest will be earned. However, when interest rates increase, the loan is not as likely to be prepaid (Brueggeman and Fisher, 2008).

Other reasons why prepayment might occur were stated by Fabozzi (2001). First, homeowners prepay the entire mortgage when they sell their home. The sale of a home can result from 1) a change of employment that necessitates moving 2) the purchase of a more expensive home 3) a divorce in which the settlement requires sale of the marital residence. Second, in the case of homeowners who cannot meet their mortgage obligations, the property is repossessed and sold. The proceeds from the sale are used to pay off the mortgage in the case of a conventional mortgage, and for those that are insured the balance is paid by the insurer. Third, if property is destroyed by fire, or if another insured catastrophe occurs, the insurance proceeds are used to pay off the mortgage balance.

3.4.4 Liquidity Risk

Liquidity risk is the risk that an asset may not be easily and rapidly sold for cash at its current value (Clauretie and Webb, 1993). Securities that can be easily sold and resold in well-established markets will require lower premiums than those that are more difficult to sell (Brueggeman and Fisher, 2008).

Chiquier et.al (2004) stated that liquidity risk can arise in mortgages due to the long term nature of these loans. Individual mortgages may not be readily converted into cash, and the money can be needed before it is due. A lender faced with short term and unstable sources of funds may not make mortgages due to the risk that it cannot meet cash outflow needs by selling its loans. Illiquid assets that are pledged for mortgages which cannot be pledged as collateral for short term borrowings also increase the liquidity risk of mortgages.

3.5 Securitization of Mortgages

A primary mortgage market is a place where mortgages are originated for the first time, whereas a secondary mortgage market is a place in where existing mortgages are bought and sold. Mortgages are originated by intermediaries such as commercial banks. Some intermediaries then sell these loans on the secondary mortgage market. By definition, the owner of a mortgage that was purchased on the secondary mortgage market did not originate the loan. Investors that purchase mortgages on the secondary market most often raise the funds required for the purchase by issuing bonds or other types of debt instruments. They will pledge the mortgages as collateral for the debt that they issue. The debt issue is termed as a mortgage related security because it is collateralized by mortgages. Mortgage related securities are considered as part of the secondary mortgage market because they are bought and sold in the secondary markets (Clauretie and Webb, 1993).

Mishkin and Eakins (2009) stated that, intermediaries faced several problems when trying to sell mortgages. The first was that mortgages are usually too small to be wholesale instruments. Many institutional investors do not want to deal in such small denominations. The second problem with selling mortgages in the secondary market was that they were not standardized. They have different times to maturity, interest rates, and contract terms. That makes it difficult to bundle a large number of mortgages together. Third, mortgages are relatively costly to service. The lender must collect monthly payments; often pay property taxes and insurance premiums, and service reserve accounts. Finally, mortgages have unknown default risk. Investors in mortgages do not want to spend a lot of time evaluating the credit of borrowers. These problems inspired the creation of the mortgage backed security.

As an alternative to selling mortgages directly to investors, a new security, backed by a large number of mortgages assembled into a mortgage pool, was created. A trustee, such as a bank or government agency, holds the mortgage pool, which serves as collateral for the new security. This is called as securitization (Mishkin and Eakins, 2009).

There are many types of mortgage related securities that have been developed in recent years. In this section, the major types of mortgage backed securities listed as follows will be discussed: 1) Mortgage-backed bonds (MBBs) 2) mortgage pass-through securities (MPTs) 3) mortgage pay-through bonds (MPTBs) 4) collateralized mortgage obligations (CMOs).

3.5.1 Mortgage-Backed Bonds

One approach to mortgage securitization that has been used by private mortgage originators has been to issue mortgage-backed bonds (MBBs). When issuing MBBs, the originator establishes a pool of mortgages which usually includes residential

mortgages. The issuer, then, issues bonds to investors from this pool. The issuer retains ownership of the mortgages, but they are pledged as security and are usually placed in trust with a third-party trustee. This trustee makes certain that the provisions of the bond issue are keeped on behalf of the security owners (Brueggeman and Fisher, 2008).

MBBs are usually issued with fixed-coupon rates and specific maturities. Moreover, the issuer usually overcollateralizes the bond issue to assure investors that the income from mortgages will be sufficient to pay interest on the bonds and to repay principal on the maturity date. Overcollateralization is done by placing mortgages in the pool with outstanding loan balances in excess of the dollar amount of the securities issued (Brueggeman and Fisher, 2008).

MBBs are rated by rating agencies such as Standard and Poor's and Moody's. They consider a number of factors in their rating as follows: 1) the quality of the mortgages in the pool 2) the interest rate spread between that on the mortgages and that on the MBBs 3) the likely rate of prepayments of the mortgages 4) the geographic diversification of the mortgages in the pool, and 5) the amount of overcollateralization (Clauretie and Webb, 1993).

3.5.2 Mortgage Pass-Through Securities

Mortgage-pass through securities (MPTs) are the most common type of mortgage-backed securities. MPT is a security that has the borrower's mortgage payments pass through the trustee before being paid to the investors (Mishkin and Eakins, 2009). That is why the securities are called pass-through, because cash flows are passed through to the investors by the trustee.

Mortgage pass-through securities are issued against a specific collateral pool subject

to cash flow matching (Chiquier et.al, 2004). They are issued by a mortgage originator and represent an undivided ownership interest in a pool of mortgages. Each mortgage placed in the pool continues to be serviced by its originator or an approved servicer. A trustee is specified as the owner of the mortgages in the pool and ensures that all payments are made to individual investors. Cash flows from the pool, which consists of principal and interest, less servicing and guarantee fees, are distributed to security holders (Brueggeman and Fisher, 2008).

Mortgage pass-through securities are typically not the liability of the issuer and feature credit enhancement through a variety of techniques. They may be issued by lenders or conduit institutions. The best known pass-through securities are the ones that are guaranteed by Ginnie Mae and those issued by Fannie Mae and Freddie Mac in the US (Chiquier et.al, 2004).

Clauretie and Webb (1993) stated that, investors are attracted to pass-through securities due to their relatively high yield, liquidity, and risk-free quality. However, many investors do not like the uncertainty of the timing of the cash flows, because of the unpredictable prepayments of mortgages (Clauretie and Webb, 1993).

Some pass-through securities are rated by the rating agencies. Rating agencies review the credit risk of the collateral and the loan-to-value ratios. They will also rate the capability of the issuer to make cash advances to cover the principal and interest on delinquent and defaulted properties (Clauretie and Webb, 1993).

3.5.3 Mortgage Pay-Through Bonds

Mortgage pay-through bonds are mortgage related securities that can be considered between pass-through securities and mortgage-backed bonds in terms of their

characteristics. Similar to mortgage-backed bonds, the issuer retains ownership of the pool of mortgages and issues the mortgage-pay through bonds as a debt instrument. As with a mortgage pass-through security, the cash flows to the investor are based on the coupon rate of interest, while principal from amortization and prepayments is passed through as received from the pool mortgages (Clauretie and Webb, 1993).

Agencies also rate mortgage pay-through securities, based on the same factors associated with mortgage-backed bonds. However, the extent of overcollateralization in mortgage pay-through bonds is less than with mortgage-backed bonds due to the fact that in mortgage-pay through bonds scheduled amortization of the mortgages and prepayments is passed through to investors to reduce the principal of the bonds (Clauretie and Webb, 1993).

3.5.4 Collateralized Mortgage Obligations

Collateralized mortgage obligations (CMO) are similar to MBBs because they are also issued using a pool of mortgages for collateral. On the other hand, CMOs are different than MPTs because in the MPT securities, investors own an individual interest in the entire pool, where the investors in a CMO invest in the bonds issued by the owner of the mortgage pool. However, like mortgage-pass through securities and mortgage-pay through bonds, the CMO is a pay-through security in that all amortization and prepayments are passed through to investors. This means that the security holder continues to assume prepayment risk. However, CMO, differently from other mortgage-backed securities, modifies how the prepayment risk is allocated, because CMOs are securities issued in multiple classes against the same pool of mortgages. These securities may have a number of maturity classes, such as three, five, or seven years. Such maturities are chosen by the issuer to meet the investment needs of various classes of investors (Brueggeman and Fisher, 2008).

Mishkin and Eakins (2009) stated that when principal is repaid, investors in the first class are paid first, then those in the second class and so on. Investors choose a class that matches their maturity requirements. For example, if they will need cash from their investment in a few years, they purchase class 1 or 2 CMOs. If they want the investment to be long-term, they can purchase CMOs from the last class. As a matter of fact, even when an investor purchases a CMO, there are no guarantees about how long the investment will last. If interest rates fall significantly, many borrowers will pay off their mortgages early by refinancing at lower rates.

3.6 Benefits of Secondary Mortgage Markets

A properly structured secondary market can provide significant benefits to a housing finance system, and ultimately to the entire economy. The benefits of secondary markets were listed by Lea (1994) as follows:

- A secondary mortgage market increases the availability of funds for housing by overcoming the geographic mismatch between the suppliers and demanders of funds.
- A secondary mortgage market can overcome an institutional mismatch between institutions wherein the capacity or inclination to hold and originate long term assets differs. By expanding the pool of funding options available to primary market lenders, there is less pressure on governments to provide direct (and often subsidized) credit to homebuyers.
- A secondary mortgage market can lower the cost of mortgage credit through a more efficient allocation of risk. Through matching of long term mortgages with long term sources of funds with a secondary mortgage facility, interest rate risk allocation can be improved. Through nationwide diversification, credit risk can be lowered. Through expansion of funding opportunities for primary lenders, liquidity risk may be reduced.

- A secondary mortgage facility can reduce the transactions costs of mortgage lending and investment through standardization of mortgage loan documentation, underwriting and servicing and creation of standardized securities.
- Expansion of the secondary mortgage market and functional specialization can reduce costs through economies of scale.
- A secondary mortgage market, by expanding the funding sources for mortgages improves the competitive environment which can lead to cost reductions for participants and borrowers.
- A secondary market can improve affordability of housing finance for borrowers through lower rates, through the offering of longer maturity mortgages and alternative mortgage instruments.
- An active secondary market enhances the marketability of the securities, reducing the risk of investment and ultimately mortgage rates. Not only will improved marketability lower the relative costs of mortgage securities, it can also be a catalyst for the development of the overall bond market.

Mishkin and Eakins (2009) stated that, mortgage-backed securities have been a very important development in the financial markets in recent years. These new debt instruments compete for funds with government bonds, corporate bonds, and stocks. Securitized mortgages are low-risk securities that have higher yields than comparable government bonds and attract funds from around the world. The authors further stated the side effect of the development of securitized mortgages as that the mortgage rates are now more open to national and international influences. As a result, mortgage rates are more volatile than they were in the past.

CHAPTER 4

MORTGAGE SYSTEMS IN SOME DEVELOPED AND DEVELOPING COUNTRIES

4.1 Mortgage Systems in Developed Countries

Developed countries have advanced housing finance systems. Generally they have well-functioning financial institutions and funds flow from people with fund surpluses to the ones who need them in order to buy a house. They have secondary mortgage markets in which they can reduce the risks of the mortgage lenders.

According to Renaud (1999), the advanced housing finance systems found in the developed countries have grown out of the two main traditions going back to the 19th century. He says that there is the thrift tradition of Anglo-Saxon systems where the building societies of the United Kingdom and the savings and loans institutions from the United States are mutual forms of housing finance. On the other hand, there is also the mortgage bank tradition of continental Europe where term funding was mobilized through bond markets. Particularly strong in northern European countries such as Denmark and Germany, institutions based on this model exist in most of the continental Europe. Today, the mortgage market share of these special housing finance circuits is decreasing as financial systems evolve and converge steadily due to financial innovation, the digital revolution and the globalization of capital markets. As a matter of fact, the emphasis is shifting from specialized institutions to specialized financial services in what is today a remarkable dynamic mortgage finance industry.

In this section, some examples of advanced mortgage systems from developed

countries are reviewed. Firstly, some information related with the general economic and demographic background of the countries is given and then the general characteristics of their mortgage systems are explained. The data related with the economic and demographic indicators of all the countries are collected from the web site of the Organization for Economic Cooperation and Development (OECD) and all of the data are as of 2007 in order to be able to make possible comparisons between the numbers. Mortgage systems of the United States and some developed countries from the European Union are explained in order to understand their experiences and come up with ideas that could be successful in the establishment of the Turkey's mortgage system.

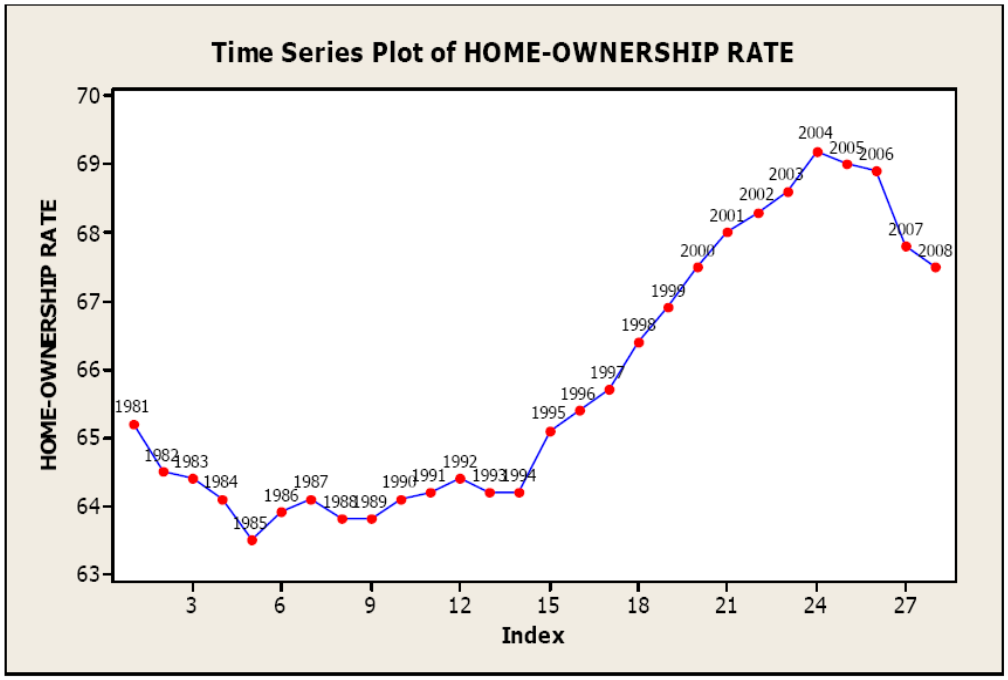
4.1.1 United States: General Characteristics of the Mortgage System

According to Boleat (1985), housing finance system in the United States (US) deserves particular attention for a number of reasons listed as follows:

a. The US is the biggest economy in the world, and developments in the US economy, for example, with respect to interest rates, affect other economies.
b. There has been a tendency for developments in financial institutions in the US to be followed by similar developments in other countries.
c. The US housing finance system is the most developed, particularly in respect of the secondary market.

The US is the largest economy in the world with a gross domestic product (GDP) of 13,742 billion US dollars in 2007. The average GDP growth rate for the country is 3.43 percent, proving the high standard of living in the country. Again as of 2007, the population of the US was 301,621,000 which is approximately 5 percent of the world population. The country has a fairly rapid rate of average population growth that is 1.20 percent.

US have a tradition of owner-occupation and home-ownership is frequently referred to as being the American dream. By 1930, 47.8 percent of housing units were owner-occupied, but the proportion fell to a low point of 43.6 percent in 1940. Then, owner-occupation increased markedly in the 1940s, and in 1980, 65.6 percent of units were owner-occupied (Boleat, 1985). Home-ownership rate had grown to 69 percent in 2004 from 65.6 percent in 1980. Since the peak in 2004, it had rapidly declined. As of the end of 2008, home-ownership rate in the US was 67.5 percent. Figure 4.1 below shows the trend of the home-ownership rates in the US from 1981 to 2008.



Source: U.S. Census Bureau

Figure 4.1 Home-Ownership Rates in the US

The increase in the home-ownership rate starting from 1994 till 2004 in the US is potentially attributable to many factors. There were changes in the availability of mortgage products, such as low down payment loans and subprime loans. There were also demographic changes and low interest rates that would affect demand.

Finally, the introduction and tightening of federal housing goals for Fannie Mae and Freddie Mac may have also played a role (Frame, Lehnert, and Prescott, 2008).

Owner-occupied housing and mortgages used to finance it are currently the single largest asset and liability on the US households' balance sheet (Lehnert, 2005). Mortgage debt to GDP ratio in the US was 69 percent in 2004. This ratio had increased to 74.7 percent in 2007.

Considering the development of the mortgage system in the US, it can be said that, there has been a long tradition of government intervention in the US mortgage market beginning in the 1930s when institutions were established to facilitate the flow of funds back into the residential mortgage market which was largely disappeared by the Great Depression. First, Federal Housing Administration (FHA) was created to insure mortgages, increasing investor confidence in mortgage assets and fostering the acceptation of the long-term, self-amortizing mortgage instrument (Diamond and Lea, 1992). Then, the securitization of mortgages and their trading on the secondary mortgage market began in the 1930s with the creation of Fannie Mae. Other major milestones in securitization included the establishment of GNMA in 1968 and of Freddie Mac in 1970. Congress created the three federal agencies that are Fannie Mae, Freddie Mac, and GNMA to enhance secondary mortgage markets and therefore they are called as the government sponsored enterprises (GSEs). GSEs are dominant players in the secondary mortgage market of the US (Follain and Zorn, 2000).

Until the early 1970s, housing finance in the US was quite simple. Loans were made at fixed interest rates over 25 or 30 years. The main lenders were specialist savings and loan associations, mutual savings banks and commercial banks. However, in the 1970s, a secondary market greatly expanded, which led to the growth of the mortgage system, consisting of institutions which made and serviced loans but did not hold them, and which also permitted institutional investors to

invest in the mortgages. So, the nature of the market has changed radically. The main change has been the decline in the market share of the savings and loan associations, matched by a sharp rise in the market share of the institutional investors (Boleat, 1985).

The reason for the change in the nature of the market in the US in 1970s was the savings and loan crisis. In 1950, one-half of all the mortgage debt (residential and commercial) was held by depository institutions like commercial banks or savings and loan associations. By 1960, this ratio had increased to 56 percent. These institutions were particularly vulnerable to interest-rate risk due to the fact that they issued 30-year, fixed rate mortgages. This risk occurs when there is a large difference between the maturity of an institution's assets and liabilities. This is called a maturity mismatch (Clauretie and Webb, 1993).

Between 1945 and 1966, yields on three-month treasury bills never rose above 4 percent, and in those days fixed rate mortgages typically paid between 5 and 6 percent in the market. So, depository institutions could raise capital from depositors who could get a safe-government protected yield and a higher return than Treasury bills by putting their money in a depository institution (Green and Wachter, 2005). Therefore, maturity mismatch problem was not obvious in the 1950s. However, partially as a result of the Vietnam War, the rate of inflation increased during the 1960s, and problems of maturity mismatch started to occur for the depository institutions. The yields on three-month Treasury bills got higher than 4 percent, and depositors started to withdraw their funds from these institutions and invested in the Treasury bills. Furthermore, Regulation Q, issued by the Federal Reserve Board in the 1930s, placed a limit on the rates that commercial banks could pay on deposits. Hence, depository institutions couldn't increase their deposit rates as a response to increasing Treasury-bill rates. Withdrawal of funds from the intermediaries in these conditions was called disintermediation (Clauretie and Webb, 1993). Unfortunately, this also led to lack of funds for mortgage borrowers in the depository institutions.

One of the responses to this event was the 1968 splitting of Fannie Mae into two pieces as the Government National Mortgage Association, known as Ginnie Mae, and the new Fannie Mae, which would now be privately held and would be able to buy and sell non-governmental-backed mortgages to raise additional funds for the loans (Green and Wachter, 2005).

As a matter of fact, what Congress did in 1968 was to move aggressively to develop a secondary market for mortgages, which is a market in which depository institutions could sell mortgages that they had originated to other investors. Following these events in 1970, the Federal Home Loan Bank Board (FHLBB) created the Federal Home Loan Mortgage Corporation (later known as Freddie Mac), with a mandate to buy loans from members of the Federal Home Loan Bank system (Gerardi, Rosen, and Willen, 2007). In other words, Freddie Mac securitized mortgages originated by savings and loan associations. On the other hand, the mortgage insurance function was kept inside the government through Ginnie Mae for two reasons as to continue to provide a full-government-backed guarantee of timely payments of FHA-foreclosed mortgages to the lender and to be able to package and securitize FHA loans (Green and Wachter, 2005). This period also saw the emergence of the mortgage-backed security, a bond whose cash flows are backed by homeowners' mortgage payments. The first mortgage-backed security of Ginnie Mae was issued in 1970, and Fannie Mae and Freddie Mac followed shortly thereafter (Gerardi, Rosen, and Willen, 2007)

Continued instability and high interest rates in the late 1970s initiated the final phase of the reinvention of housing finance in America (Gerardi, Rosen, and Willen, 2007). The decade of the 1970s began with a 6 percent rate of inflation and ended in 1979 with prices rising at 13.3 percent annually. In addition to the maturity mismatch problem for the thrifts, the high rates of inflation and interest caused housing affordability problems for the home buyers (Clauretie and Webb, 1993). In fact, the withdrawal of funds from thrifts led to a crisis in the savings and loan

industry, a major structural change in US mortgage markets and ultimately, a transformation of the housing finance system (Green and Wachter, 2005). The commercial banking industry was not nearly as affected since, unlike savings and loans associations, which by statute invested in mortgages, banks were able to invest in a variety of assets (Green and Wachter, 2005).

Legislation responded to the new environment and removed deposit ceilings and allowed savings and loans to invest in adjustable-rate mortgages (Green and Wachter, 2005). After this, when a borrower demanded an adjustable-rate mortgage, the lender kept the loan because the borrower was taking the interest-rate risk. On the other hand, if the borrower demanded a fixed-rate mortgage, then the lender sold it to Fannie Mae, Freddie Mac, or Ginnie Mae. These institutions pooled the mortgages that they bought and sold them to investors. In addition, their balance sheets were more suitable for holding fixed-rate long term loans than the depository institutions' balance sheet. Thus, the American mortgage market transformed from a largely deposit-financed system to a largely capital markets-financed system (Gerardi, Rosen, and Willen, 2007).

The savings and loan crisis in the US made clear the dangers of funding short-term liabilities with long-term assets in markets with volatile interest rates. Depository institutions can hold fixed-rate mortgages only when nominal interest rates are low and stable, as they were in the 1950s and 1960s. With securitization, long-term assets can be funded through accessing capital markets (Green and Wachter, 2005).

Today, the most important part of the housing finance in the US is done through the secondary mortgage markets. Mortgages are originated by a variety of institutions, including the traditional depository institutions (commercial banks and thrifts), the mortgage bankers, and the mortgage brokers. In addition, loans to targeted groups of borrowers may be made by a special lending program within any of these institutions (Lehnert, 2005).

On the other hand, borrowers can choose from a large menu of mortgage options that allow them to select both the interest rate and the amortization characteristics. In addition, majority of these mortgages allow free prepayment. Typically, mortgage rates can be fixed for one to ten years before converting to an adjustable rate mortgage, or the borrower can choose to have a standard 15 or 30 year fixed rate mortgage (Lehnert, 2005). Fixed rate mortgages are available at all maturities in the US. American borrowers can also obtain residential mortgages at attractive terms with very low down payments. The maximum loan to value ratio in US in 2005 was 97 percent (Green and Wachter, 2005).

Originators of mortgages can sell almost any type of mortgage into a well developed secondary mortgage market in the US. The secondary market consists of many different institutions, including government-sponsored enterprises (GSEs), mortgage conduits, investment banks, and pools of managed assets. Mortgages that satisfy certain legally mandated restrictions on credit risk and size are most often securitized by Fannie Mae or Freddie Mac. Large mortgages, those with higher than normal credit risk, and mortgages with adjustable rates are likelier to be securitized by private entities (Lehnert, 2005). Many mortgage backed securities are held by insurance companies, mutual funds, and many other domestic private entities. There are also many foreign holders of GSE mortgage backed securities. Large banks hold at least 20 percent of publicly traded mortgage backed securities (Passmore et al., 2006).

As a matter of fact, GSEs enhance secondary markets mainly through mortgage securitization. On the other hand, they also issue debt to finance the purchase of their own mortgage backed securities. Purchasers of their debt assume that the government provides the GSEs with a government guarantee, even though Congress has made no explicit promise to guarantee such debt. The difference between the interest rates paid on private corporate debt and the rates paid by the GSEs is a measure of the implicit subsidy. Investors' perception of a government guarantee

suggests absence of market discipline in GSE senior debt financing and a supernormal return on equity for GSEs (Passmore et al., 2006).

Actually, Green and Wachter (2005) stated that utilizing lower than market rate financial capital raises the risk that society will invest an inefficiently high amount in housing, and also the risks of that investment are being underpriced by the market. But obviously an explicit removal of the implicit government guarantee would also eliminate the funding advantage that allows Fannie Mae and Freddie Mac to create large pools for their mortgage-backed securities as a safe haven in times of financial distress. However, both Fannie Mae and Freddie Mac clearly failed to perform one of the most basic functions of a publicly traded company that is to report earnings correctly and according to generally accepted accounting practices. At the center of these reporting problems is accounting for the derivatives that they issue and use to manage their interest rate and duration risks.

To hedge against interest rate changes and to reduce the volatility of duration, mortgage-backed securities in the United States are sliced using one of four broad derivative types: 1) sequential tranches; 2) planned amortization class (PAC) and companion bonds; 3) interest only (IO) and principal only (PO) strips; and 4) floaters and inverse floaters. These financial instruments are crucial to the ability of the United States to finance its unusual mortgage structure, because they allow investors to manage the complicated interest rate risk included in the US mortgages. The derivative markets increase investment demand for mortgage-backed securities, thus supporting liquidity and delivering low-cost funding, even in times of financial distress, for the mortgage market (Green and Wachter, 2005). However, one problem with the derivatives is about their disclosure. Fannie Mae and Freddie Mac's disclosure practices do not satisfy the requirements of a publicly traded company. Their derivative transactions are not transparent. According to Green and Wachter (2005), Fannie Mae and Freddie Mac carries the risk that they will fail in a way that will either cost the federal government a lot of money, or lead to a

systemic crisis in U.S. financial markets, or both. They said that the risk is real, but the benefits from the current U.S. system of mortgage finance for borrowers and macroeconomic stability are also real and should not be lightly discarded.

Unfortunately, the risk occurred in the U.S. In the mid-summer of 2008, as the US housing market continued to weaken, concern about the solvencies of Fannie Mae and Freddie Mac had increased. Market analysts concluded that the agencies were poorly capitalized. This amplified doubts about the agencies' ability to support the US housing market, further increasing the negative outlook for the US economy. Towards the end of the summer in 2008, stress at Fannie Mae and Freddie Mac, and the failure of Lehman Brothers were followed by severe difficulty in the global interbank funding network and widespread institutional distress. On September 7, 2008, Fannie Mae and Freddie Mac were placed into conservatorship by the Federal Housing Finance Agency, and given access to capital and funding from the US Treasury in order to avoid unacceptably large dislocations in the financial sector and the economy as a whole. While that action reduced the expectation of default on agency unsecured debt and securitizations, it caused losses for the agencies' equity and subordinated debt holders (Bank of England, 2008).

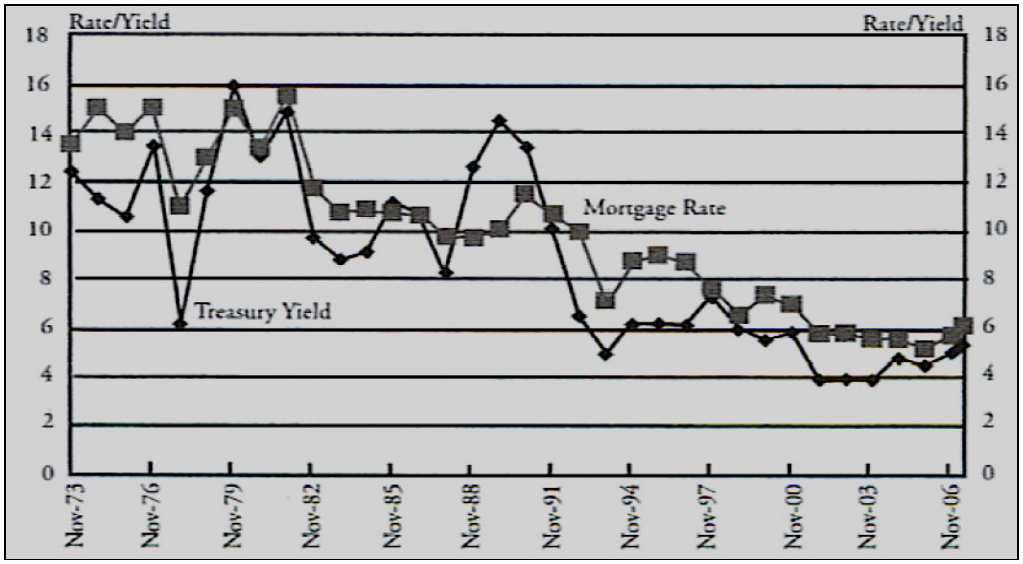
It is also important here to note that the instability that occurred in the global financial system towards the end of the summer in year 2008 was rooted in the weaknesses within the financial system that developed during an extended global credit boom; rapid balance sheet expansion; the creation of assets whose liquidity and credit quality were uncertain in less benign conditions; and fragilities in funding structures (Bank of England, 2008).

4.1.2 United Kingdom: General Characteristics of the Mortgage System

United Kingdom has a well established mortgage system that has evolved in

response to changing situations over a period of around 150 years. The system does not result from the specific actions of the government and there has been no general government policy towards the development of the system. Nevertheless, the experience of United Kingdom is valuable for other countries because, in terms of its experience in its mortgage system development, the country shows that mortgage lending will increase if there are the right macroeconomic, legislative and regulatory conditions, and if the mortgage lending is seen as a normal banking function (Boleat, 2004).

Considering the macroeconomic background of the United Kingdom, the country had a GDP of 2,168 billion US dollars in 2007. The country had an average GDP growth rate of 3.40 percent (OECD). In addition, according to Green and Wachter (2007), a major decline in interest rates in the United Kingdom linked the housing finance in the country to the global capital markets. In other words, the decline in the cost of market funding led to the move to market based financing in the country. Figure 4.2 below shows the decline in mortgage rates in the United Kingdom with the decline in the treasury yields.



Source: Green and Wachter, 2007

Figure 4.2 Treasury Yields and Mortgage Rates in the United Kingdom

Looking at the demographic characteristics of the country, the population of the United Kingdom was 60,975 thousand in 2007. In addition, the average population growth rate of the country was 0.26 percent (OECD). The total number of dwellings was estimated at 25.3 million in 2004, with the average household size steady at 2.4 people (Aydın, 2006). According to the EMF 2007 Factsheet about the United Kingdom, high levels of inward migration and falling household size as a result of the aging population and relationship breakdowns, creates strong demand for housing in the country.

Owner-occupation rates have increased substantially over the past 25 years in the country. The main reasons for this increase were the significant transfer of social housing to private ownership under Right to Buy and similar initiatives. Social housing still accounts for the majority of rental property, but the increase of private landlords associated with the buy-to-let lending has reversed the long-term decline in the private rental sector (EMF, 2007-c).

The Right to Buy legislation was one of the most important policies applied by the Conservative Party that came to power at the end of 1979, introducing the new economic program aiming at the liberalization of the economy which affected the housing in the country. This legislation gave most local authority tenants the right to buy their dwellings at substantial discounts. According to this legislation, local authority housing was privatized either by selling them to tenants or transferring them to housing associations, trusts and private companies for renting or resale (Aydın, 2006).

On the other hand, buy-to-let is a form of residential investment in the United Kingdom where a borrower buys a property, usually with the aid of a mortgage, and then rent the property out. The 1988 Housing Act made investment in residential property more attractive to landlords when it introduced a new type of tenancy giving landlords more control over their properties and there has been a modest

recovery in the private rented sector since then. The increased availability of loans at attractive rates of interest for buy-to-let purchasers has also increased the appeal of owning rental property (http://www.cml.org.uk, 2009).

As Stephens (2003) states and as it can be understood from the explanations above, owner-occupation rose gradually until the 1980s in the United Kingdom. But, starting from the 1980s, owner occupation was boosted in the country by the disounted sales of social rented housing to sitting tenants. According to the Hypostat 2007 of EMF, the owner-occupation rate in the United Kingdom in 2005 was 70 percent where the average owner occupation rate for the 27 European Union countries was 70.4 percent.

According to the EMF 2007 Factsheet about the United Kingdom, United Kingdom has overtaken Germany to become the largest residential mortgage market in the European Union (EU). Residential mortgages account for a high percentage of the personal sector debt. In 2007, the percentage of residential mortgage debt to GDP was 86.3 percent in the country where the average residential mortgage debt to GDP ratio for the 27 EU countries was 50.1 percent. The total value of mortgages in the United Kingdom in 2007 was 1,745,790 million Euros. But the early months of 2008 have shown a marked decline in lending levels. Continued funding constraints for lenders have reduced the availability of mortgages and tightened the lending criteria. Consumer confidence in the housing market has deteriorated as a result of both general credit market conditions and events surrounding specific lenders. This has decreased the demand for mortgages (EMF, 2007-d).

Considering the development of the mortgage system in the United Kingdom, it can be said that, building societies have been central to the mortgage market in the country. Building societies date back to the late 18th century. They were originally small groups of people who got together to pool their human and financial resources to build themselves homes. When all the members had been an owner of a house,

the building society was closed. In the 19th century, building societies gradually developed into permanent retail finance institutions. They found that the process of providing each of their members with homes could be speeded up if money was borrowed from other people who did not want a home. Interest had to be paid on these deposits and accordingly interest had to be charged on loans (Boleat, 2008).

Traditionally, building societies raised all their funds through the retail markets. Since the early 1980s building societies have also had access to the wholesale markets and they have raised a significant proportion of their funds from bank deposits, synidicated loans, eurobonds and other capital market sources (Boleat, 2008). Today, a building society may not raise more than 50 percent of its funds from the wholesale markets. The average proportion of funds raised by building societies from the wholesale markets is 30 percent (http://www.bsa.org.uk, 2009).

The standard mortgage instrument of the building societies was variable rate mortgages. Variable rate mortgages was necessary for the building societies, because they were funding their mortgages mainly with retail deposits and variable rate mortgages allowed them to withstand the more volatile interest rates in the 1970s and 1980s. However, it should also be noted that the rapid increases in mortgage rates were uncomfortable for many borrowers (Boleat, 2008).

Diamond and Lea (1992) stated that, the integration of housing finance with the capital markets occurred more quickly in the United Kingdom than in the United States. The authors said that, in 1980, soon after the Conservatives came to power in the country, the commercial banks were freed from credit controls which permitted them to compete with the building societies in mortgage lending. Commercial banks saw the mortgage and long-term savings markets as the ones in which they should be operated in given their large customer base, substantial branch networks and expertise in financial markets (Boleat, 2008). By 1982, commercial banks had a share which was more than one third of the market. Since the 1990s

some of the commercial banks have acquired former building societies. Further, Diamond and Lea (1992) stated that, an additional competition figure besides mortgages and long-term savings between banks and building societies emerged with the importation of mortgage-backed securities from the United States in the mid 1980s. In that time period, centralized mortgage lenders entered the market in response to wide spreads between the mortgage rates and the money market rates. Their main funding source was wholesale sources, and they funded themselves primarily with mortgage-backed securities. Although the share of centralized mortgage lenders had declined to less than 5 percent in the early 1990s, the presence of these innovative and efficient wholesale funded lenders competing directly with the depositories has speeded the integration of the mortgage markets into the broader capital markets. Another factor that accelerated the integration of housing finance with the capital markets was the increased reliance of the building societies on wholesale funding.

Today, firms use retail and wholesale sources of finance in the United Kingdom, and there has been growing use of secondary sources of finance such as mortgage backed securities, covered bond issues and loan portfolio sales. Retail deposits remain the main funding source in the country and mortgage backed securities account for only a minor part (EMF, 2007-c). Boleat (2008) stated that there is no legislation governing any of the specific forms of funding for the lenders and in very round terms 60 percent of the outstanding mortgage loans is funded by retail deposits, where 20 percent is funded by mortgage backed securities, 5 percent is funded by covered bonds, and 15 percent is funded by other wholesale funding such as through certificates of deposits, time deposits, commercial bonds, and interbank loans.

The following table shows the total amount of residential mortgage-backed security (RMBS) issues and the total amount of covered bonds issuance for United Kingdom and for some other countries in the European Union. As it can be observed from the

table, United Kingdom has the highest amount of total RMBS issuance whereas Denmark has the highest amount of total covered bonds issuance as of 2006.

Table 4.1 Total Covered Bonds and RMBS Issuance in Some European Countries

Country	**Total Covered Bonds Issuance (backed by mortgages), € million (as of 2006)**	**Total RMBS Issues, € million (as of 2006)**
United Kingdom	23,770	138,800
Germany	35,336	6,200
Denmark	114,014	N/A
Spain	69,890	36,400
Netherlands	5,500	26,500
Italy	N/A	16,500

Source: EMF, Hypostat 2007

Considering the mortgage lenders, a wide range of banks, building societies and other specialist firms are active in the mortgage market of the United Kingdom. At the end of 2005, 60 percent of the total mortgage lending was with banks, 18 percent was with building societies, and 23 percent was with other specialist lenders (EMF, 2007-c).

Boleat (2008) stated that, mortgage lending in the United Kingdom is regarded as a mainstream mortgage lending activity rather than a specialist activity to be conducted by specialist institutions, since well over 90 percent of all the mortgage loans in the country are made by retail banks which can be divided into four categories as the building societies, retail banks that were previously building societies, retail banks that merged with former building societies, and retail banks that have developed with their own mortgage business. The author also adds that, while the lenders obtain some of their business directly, a significant

proportion is obtained through mortgage brokers who work on a commission basis. These intermediaries include real estate agents and insurance brokers. In this intermediation, borrowers gain the opportunity to obtain a lower rate of interest where the brokers earn a commission each time a new loan is taken out. EMF (2007-c) stated that, more than half of the mortgages are distributed via mortgage intermediaries in the United Kingdom.

The dominant type of mortgage instrument used in the United Kingdom is adjustable rate mortgages. In practice, the interest rate on these mortgages moves broadly in line with the money market rates. Therefore it can be said that, the borrowers bear a significant interest-rate risk which they don't actually realize and have means to easily hedge. Lenders generally offer a discount for the first few years of the adjustable rate mortgages to attract new borrowers. On the other hand, the majority of fixed rate mortgages are relatively short-term in nature, and they are taken out for up to 5 years. At the end of the fixed period, another fixed rate loan is offered or the loan is changed into an adjustable rate mortgage (Boleat, 2008; EMF, 2007-c; Green and Wachter, 2005).

Green and Wachter (2005) stated that, the main reason why adjustable mortgages dominate in the United Kingdom is the reliance of the country on mainly depository institutions, rather than capital markets to fund mortgages. Moreover, the authors add the views of Miles (2003) that, the borrowers in the United Kingdom do not understand the benefit of paying a higher payment on the mortgages in exchange for a reduction in interest-rate risk, because fixed-rate mortgages have never been widely used in the United Kingdom.

Considering the loan to value ratio of the mortgages in the United Kingdom, it can be said that a mortgage with 90 percent of the value of a property is fairly standard in the country. For the mortgages with more than 90 percent of the value of the property, lenders typically charge a higher interest rate.

4.1.3 Germany: General Characteristics of the Mortgage System

A distinguishing feature about housing in Germany is the owner occupation rate in the country which is the lowest among the 27 European Union countries. Additionally, the distinguishing features about the mortgage system of Germany are firstly the contract system which is used more than in any other country, secondly the extensive usage of the deposit taking system and the mortgage bank system, and thirdly the specialist organizations that provide most of the mortgages which are mostly the subsidiaries of the banks (Boleat, 1985).

Considering the macroeconomic background of Germany, the country had a GDP of 2,829 billion US dollars in 2007. The country had an average GDP growth rate of 1.86 percent (OECD). According to the Hypostat 2007 published by the European Mortgage Federation, due to the economic upturn in Germany, the unemployment rate declined from 9.8 percent in 2006 to 8.4 percent in 2007. Inflation increased to almost European Union average level in 2007, with the consumer price index rising by 2.3 percent, following a 1.8 percent increase in 2006. Additionally, the typical mortgage rate in Germany in 2007 was 5 percent where the average mortgage rate for the 27 European Union countries was 5.1 percent (EMF, 2007-d).

Looking at the demographic characteristics of Germany, the country had a population of 82,247 thousand in 2007. In addition the average population growth rate of the country was 0.31 percent (OECD). Decreasing average size of households is leading to moderate growth of the number of households. In recent years construction activity has declined. However, construction is expected to rise slowly (EMF, 2007-b).

In terms of construction it can be said that, Germany was highly destroyed during the Second World War, and there was an acute housing shortage in the country until the 1960s. The government provided enormous state support for house-building up

until the mid-1960s that was available for both rented and owner occupied dwellings which met minimum standards and which were occupied by low-income people. Moreover, in 1981 the government tried to stimulate the production of new housing by increasing the depreciation allowance on rented housing, easing rent restrictions and giving tax incentives to some home-buyers (Boleat, 1985). According to Hypostat 2007 published by the European Mortgage Federation, in 2006, investments in residential construction performed positively for the first time in several years. The abolition of the tax credit for the first-time-buyers (Eigenheimzulage), which was ended from January 1st 2006, triggered a strong rise in building permit applications towards the end of 2005. However, the contributory factors to the boost demand in 2006 were no longer present in 2007, with the consequence that the indicators for construction of new buildings performed considerably below the 2006 level.

The German owner occupation rate, as stated before, is the lowest among the 27 countries of the European Union and the rate differs between West and East Germany, namely the rate is higher in the western part of the country (EMF, 2007-b). Owner occupation rate in Germany in 2007 was 43.2 percent, where the average rate for the 27 European Union countries was 70.4 percent (EMF, 2007-d). Wyman (2003) stated that the low rate of home ownership in Germany was in part driven by the tax advantages to property rental. Therefore, a large portion of the mortgage market in the 1990s consisted of lending on rental properties. However, today owner occupied finance dominates because the tax advantages were ended at the end of the 1990s.

Germany was Europe's largest residential mortgage market in terms of its residential mortgages outstanding in the country up to 2004. Starting from 2004, United Kingdom left Germany behind by having higher amounts of residential mortgages outstanding. Still, Germany had a deep mortgage market. In 2007, residential mortgage debt to GDP ratio in the country was 47.7 percent where the

average for the European Union was 50.1 percent. The total amount of residential mortgages outstanding in the country was 1,155,742 million Euros in 2007 (EMF, 2007-d).

Considering the general character of the mortgage system in Germany, Green and Wachter (2005) stated that the country's mortgage system does not just depend on depositories but it also relies on capital markets to fund mortgages through bonds called Pfandbriefe. As a matter of fact, the housing finance system in Germany is relatively complicated because most borrowers obtain their finance from more than one source and also because of the interrelationships between the various institutions (Boleat, 1985).

In the German housing finance system, mortgage banks provide credit funded in the mortgage bond market that has existed since the 1800s. Tight regulatory limits exist on the loan to value ratios and operations of the mortgage banks. To be funded through issuance of Pfandbriefe, first mortgage loans had to be less than 60 percent loan to value ratio and they are nonprepayable during the fixed rate period of the loans. The Bausparkassen, specialized institutions regulated under a separate law, provides fixed rate second mortgages funded by contract savings subsidized by the government. The commercial and savings banks traditionally make small top up loans to augment the credit obtained from other sources. Because of these different types of loans granted by different lenders, German borrowers typically obtain packages of two to four separate loans, often from separate lenders. A typical package consists of a first mortgage of 60 percent loan to value ratio supplemented with a Bauspar loan of 15 to 20 percent value and a bank top up loan for 5 to 10 percent of value which is often made on an unsecured basis (Diamond and Lea, 1992).

Currently, mortgage lending in Germany is dominated by the savings banks and cooperative banks which accounts for nearly 50 percent of the market. In addition,

specialist mortgage banks and commercial banks are also active in the German mortgage lending. Foreign lenders have a low share in the German mortgage market because of the already extremely competitive nature and low prices of the market. Another mortgage lender in Germany is Bausparkassen which accounts for nearly 10 percent of mortgages in the country. Bausparkassen offers a specialized product in which borrowers must save with the bank for a period of six to seven years before they are able to draw a loan at a favorable rate. Bauspar loans are typically used to finance a part of a property rather than the whole amount (Wyman, 2003).

Considering the main funding mechanisms in the mortgage system of Germany, it can be said that, the general balance sheet funding is the dominant one and about 76 percent of mortgages (excluding Bauspar loans) are directly funded through customer deposits, interbank deposits and unsecured borrowing. Bauspar loans are, as stated above, funded by long term special purpose savings deposits. On the other hand, mortgage banks are mainly funded by the low cost Pfandbriefe. Pfandbriefe have a market share of 24 percent of all mortgage funding in Germany, but strict regulation restricts this funding to only loans with loan to value ratios below 60 percent, leaving the residual to be funded by interbank debt. Regarding securitization, it has been slow to take off relative to other European countries. In 2006, 6,200 million Euros of residential mortgage backed securities were issued in Germany (Wyman, 2003; EMF, 2007-d).

Furthermore, long-term, fixed-rate reset mortgages dominate the German mortgage market whereas variable mortgages only account for a small portion. Maturity of the mortgages is typically 20 to 30 years with a typical initial fixed period of 10 to 15 years. In the fixed rate period, mortgages are funded through the issuance of similar maturity mortgage bonds. At the end of the fixed rate period, the rate is adjusted based on the current market pricing of the mortgage bonds. Mortgages with an initial fixed period of 5 to10 years accounted for 39 percent of gross lending in 2005 (EMF, 2007-b; Wyman, 2003; Diamond and Lea, 1992).

4.1.4 Denmark: General Characteristics of the Mortgage System

It is beneficial to analyze the housing finance system in Denmark, because it is a significant case of a system being wholly integrated into financial markets. The price of the mortgages in the country is at a market related rate. Although mortgages are not insured or guaranteed, the mortgage market still works effectively in Denmark. Financial institutions do not have the problem of matching their assets and liabilities, because their loans are exactly matched by the bonds with similar terms. The only risk that the institutions face in this system is the credit risk. In addition, one consequence of the system is the fact that borrowers cannot change the interest rate on their loans, in other words they borrow long-term fixed rate mortgages and they are locked into the interest rate at which they take out their mortgage (Boleat, 1985).

Looking at the macroeconomic background of the country, Denmark is a small open economy characterized by stable growth and low unemployment. The country had a GDP of 196,300 million US dollars in 2007 with an average GDP growth rate of 3.79 percent (OECD). The unemployment rate in Denmark was 6.4 percent at the end of 2004. Unemployment continued to decrease during 2007, and at the end of the year it reached a very low level of 3.7 percent, where the average unemployment rate for the European Union 27 was 7.1 percent (EMF, 2007-d). Additionally, the Hypostat 2007 of the European Mortgage Federation stated that, after a long period of historically low interest rates in the country, the rates had increased in 2007 and the typical mortgage rate in Denmark in 2007 was 5.9 percent where the average mortgage rate for the European Union 27 was 5.1 percent.

Demographics show that, Denmark had a population of 5,457 thousand in 2007, where the average population growth rate was 0.46 percent (OECD). Demand for housing in urban cities is increasing and the limited number of existing dwellings and of free sites in these cities lead to high price increases (EMF, 2007-a).

Furthermore, total number of households had risen by 21 percent since 1980 and it was 2,200,000 in 2004. The number of persons in each household was 2.17 in 2004 against 2.48 in 1980 (www.housingfinance.org). There were 2,680,000 dwellings in 2007 in Denmark. Out of these, 54 percent were privately owned. Further, there was a slowdown in constructions in 2007. The number of residential construction started in 2007 declined by over 40 percent from the number in 2006 (EMF, 2007-d).

The owner occupation rate in Denmark was 54 percent in 2007 where the average owner occupation rate for the 27 European Union countries was 70.4 percent (EMF, 2007-d). Around half of the housing stock was owner occupied in Denmark. The other half included dwellings rented from private landlords and social housing. This distribution had been stable over the years (EMF, 2007-a).

In Denmark, mortgage financing primarily takes place via mortgage banks. The Danish mortgage market is based on the efficient and inexpensive extension of credit. Effective interest rates are market determined and transparent. Bond investors are fully aware of the security for the bonds that is the collateralized property of the mortgage, the legislative framework and the solvency of the mortgage bank. As a matter of fact, in the 200 year old mortgage system in the country, no bond holders have suffered losses due to the default of a mortgage bank (Gjede, 1999).

Looking at the history of the mortgage system in Denmark, the first mortgage bank in the country was established in 1797 and it was called as Husejernes Kreditkasse i København. The reason for the establishment of this mortgage bank was the Great Fire in Copenhagen that happened in 1795. In this fire, 900 properties were razed to the ground and many others were damaged. The damage of the fire was huge and only half of the damage could be covered by the only fire insurance company in Copenhagen. So in this situation, the Danish state had to participate in the reconstruction of Copenhagen (Gjede, 1999).

In order to enhance access to private borrowing, the first Mortgage Credit Act was adopted in 1850. The main reason of this Act was a capital shortage. At that time, the Danish capital market was sharply segmented and as a result, interest rates were varied from province to province together with the insufficient savings in several provinces. So, the main reason for the establishment of the first mortgage banks was the desire to provide an effectively functioning capital market through institutions which were supposed to provide capital between the home buyers and the lenders (EMF, 2003).

So, as it was also stated by Diamond and Lea (1992), in Denmark the mortgage system is providing fixed rate mortgages to Danish home buyers at capital market determined rates since the late 1800s. In 1980, the vast majority of long-term housing finance was provided by mortgage credit institutions or mortgage banks as part of a capital markets funding circuits. They issued mortgage bonds on behalf of borrowers. The main buyers of these bonds were Danish banks, pension plans and insurance companies. Throughout the twentieth century, the mortgage market in Denmark was subject to tight regulation to ensure the safety of mortgage bonds. However, it should also be noted that, an explicit government guarantee has never been provided neither for the bonds nor for the mortgage banks. Additionally, long term credit could only be provided by mortgage banks and only they could issue mortgage bonds. Mortgage banks provide 80 percent loan to value fixed rate loans, secured by a first mortgage and banks supply additional top up credit as unsecured, short-term, adjustable-rate personal loans.

Danish mortgage system is based on the balance principle, which implies that there is a balance between the interest paid by the borrower and the interest received by the investor for his investment (www.housingfinance.org). In this system, every mortgage is immediately converted into a bond of the same amount. Homeowners can retire mortgages not only by paying them off, but also by buying an equivalent face amount of bonds at market price. Because the value of dwellings and the

associated mortgage bonds tend to move in the same direction, homeowners should not end up with negative equity in their properties (Soros, 2008).

Today, mortgage banks and commercial banks are active on the Danish mortgage market. Mortgage banks account for about 90 percent of the total mortgage lending (EMF, 2007-a). Denmark has a deep mortgage market and the mortgage debt to GDP ratio in the country in 2007 was 92.8 percent where the average for the 27 countries of the European Union was 50.1 percent. Total outstanding residential loans in Denmark were 211,381 million Euros in 2007 (EMF, 2007-d).

According to the 2007 Denmark Factsheet prepared by the European Mortgage Federation, the most common types of loans in Denmark are long-term, fixed-rate loans. However, the new loan types namely the interest reset loans and capped variable interest loans have become very popular over the past few years. Interest reset loans were introduced in 1996 while capped variable interest loans were introduced in 2004. Hypostat 2007 of the European Mortgage Federation stated that, interest-only loans were introduced in 2003. The interest-only period can be 10 years for loans with 80 percent loan to value and 30 years maturity. The interest-only period can be unlimited if the loan to value ratio is 70 percent or lower.

Additionally, before July 1, 2007, only mortgage banks were allowed to issue mortgage bonds/covered bonds as stated before. However, after that date, commercial banks got also able to issue covered bonds to fund mortgages. However, mortgage banks still have the exclusive right to issue mortgage bonds. This has led to the existence of three types of Danish mortgage bonds: the traditional mortgage bonds issued by mortgage banks, the new mortgage bonds issued by mortgage banks, and the new mortgage bonds issued by commercial or mortgage banks (EMF, 2007-d).

All of the mortgages granted by the Danish mortgage institutions are funded by

mortgage bonds and in fact, Danish mortgage institutions are restricted by law (the balance principle) to fund their lending activities by issuing mortgage bonds with a profile matching the repayment profile of the loan portfolio. So, accordingly the Danish mortgage bond market is one of the largest one in the world. Additionally, due to the balance principle and the structure of the market, the only risk faced by mortgage lenders is the default risk. These risks have been very low historically and every mortgage bond has been fully paid off. Borrower default rates are very low in the country and in most cases the collateral will cover any losses (Wyman, 2003).

4.2 Mortgage Systems in Developing Countries

Despite its recognized economic and social importance, housing finance often remains underdeveloped in developing countries. Residential lending is typically small, poorly accessible and depository based. Lenders remain vulnerable to significant default, liquidity and interest rate risks. As a result, housing finance is relatively expensive and often inaccessible. The importance of developing robust systems of housing finance gets more significant as developing country governments struggle to cope with population growth, rapid urbanization, and rising expectations from a growing middle class (Chiquier, Hassler, and Lea, 2004).

According to Boleat (1985), developing countries have a very poor and rapidly growing population with a very rapid urbanization. Therefore, housing finance systems should be seen in this context in the developing countries. Moreover, the financial systems are not very developed in these countries. Generally, informal systems of financing dominate the housing finance systems. In case of formal financing, commercial banks hold the largest share of personal deposits in nearly all developing countries. The difference between the banks in developed countries and in developing countries is that banks generally have little role in housing finance in developing countries because they believe that they have more profitable business

for their funds rather than giving housing loans. Moreover, the governments of developing countries have a large number of priorities which requires action more than providing housing assistance to people other than the very poorest. However, it is important that housing loans should be made available at an affordable rate of interest to middle and low income people in developing countries.

Another important point to state about developing countries is their macroeconomic instability. The state of development of a country's mortgage market basically depends upon the degree of macroeconomic stability. High rates of inflation and nominal interest rates are typical features of volatile economies that reduce affordability of traditional mortgages issued in developed countries (Erol and Patel, 2005). In other words, inflationary environments present a large challenge for housing finance systems because of the difficulty of protecting the real value of lenders' resources outstanding and providing an adequate return, while ensuring continued access to affordable credit by the borrowers (Fannie Mae, 1992). This decline in real value of payments over the term of the loan is known as the tilt effect. Since the tilt effect increases with inflation, it is clear that high levels of inflation make it more difficult for households to be qualified for loans based on their current income (Erol and Patel, 2005). It is also the reason why traditional fixed rate mortgages would be problematic in developing countries.

The usage of alternative mortgage instruments in developing countries could solve the problems stated above. The standard adjustable rate mortgages reduce tilt effect and enable mortgage lenders to manage moderate inflation risk. However, they don't perform well in periods of high inflation because high inflation creates major payment shocks for borrowers who suddenly find their monthly payments increase more than their incomes (Erol and Patel, 2005).

On the other hand, price level adjusted mortgages could be used as an alternative mortgage instrument in developing countries. They utilize an interest rate which

reflects only the real cost of funds and the prepayment risk associated with the mortgages. Initial payments are calculated based on this interest rate. The outstanding loan balance is then periodically revalued (in nominal terms) according to a price index. The result of this approach is to shift the risk of future inflation onto the borrower, while leaving the risk associated with the real interest rate with the lender. Price level adjusted mortgages allow higher level of borrowing, but have a higher default risk when real wages are falling (Fannie Mae, 1992).

Another alternative mortgage instrument that can be used in developing countries to solve the problems due to their macroeconomic instability is the dual index mortgage. Dual index mortgages relate the loan's payments and outstanding balance to an appropriate index which addresses the key concerns of both the borrowers and the lenders. The payments are indexed to some measure of income in order to maintain the affordability of the loan to the household. The nominal balance of the loan is indexed to a measure of inflation in order to protect the real value of the lender's asset. Dual index mortgages allow higher level of borrowing and protect against default risk, but have potential costs for refinancing (Fannie Mae, 1992).

In this section, after the general overview of the situation of mortgage systems in developing countries, examples of mortgage systems from some of these developing countries are given. Firstly, some information related with the general economic and demographic background of the countries is presented and then the general characteristics of their mortgage systems are explained. The data related with the economic and demographic indicators of Mexico and Brazil are collected from the web site of OECD and all of the data are as of 2007 in order to be able to make possible comparisons between the numbers. The data about Colombia is gathered from the web site of International Monetary Fund (IMF) from the World Economic Outlook Database, and again all of the data are as of 2007.

Mortgage systems of Mexico, Brazil and Colombia are explained in order to

understand their experiences. The reason why these three countries are chosen is that, their housing finance systems have also suffered from repeated periods of macroeconomic stability like Turkey. As stated by Renaud (2005), macroeconomic stability is the definite prerequisite for the development and growth of mortgage markets and sustainable long-term finance. These Latin American countries have the same problem with Turkey in front of the establishment of a well-functioning mortgage system. For example, the experience of Mexico is a good example of successful macroeconomic reforms that have lead to successes in terms of private mortgage lending since 2000. So, it is important to see the overall picture of the mortgage systems in these countries.

4.2.1 Mexico: General Characteristics of the Mortgage System

Governments in Mexico have been focused on providing nationwide housing finance for a long period of time. For generations, Mexico primarily implemented this goal through state-sponsored housing funds, which were known with their inefficiency and poor governance. During the beginning of the 1990s, privatization of the banking sector led to very rapid growth in mortgages, but the sharp increase in interest rates after the 1994 Tequila crisis contributed to record defaults and the near-collapse of the banking sector. This was followed by a long period of lending reduction. Since 2001, the Mexican authorities have focused on developing the framework and infrastructure to support primary and secondary mortgage markets. Therefore, in recent years, both the primary and secondary mortgage markets have been developing in the country (Zanforlin and Espinosa, 2008).

The historical macroeconomic environment in Mexico has not been favorable for the development of primary mortgage markets. Since the early 1980s, the country has experienced numerous financial crises and macroeconomic volatility. Inflation reached a high rate of almost 120 percent in 1983 and then an all time high of

almost 180 percent in 1988. While the early 1990s seemed to be a period of recovery, macroeconomic instability again appeared in the 1994 Tequila crisis. In this period inflation fluctuated to the 50 percent range and short-term government treasury rates increased to 74.5 percent (Lea, 1999).

Looking at the macroeconomic indicators of Mexico, the country had a GDP of 1,480 billion US dollars in 2007 with an average GDP growth rate of 1 percent (OECD). According to the IMF, World Economic Outlook Database, annual percentage change in inflation was 3.97 percent in 2007 in Mexico.

Considering the demographics, Mexico had a population of 105,791 thousand in 2007 with an average population growth rate of 1.62 percent (OECD). According to Zaltzman (2003), Mexico has experienced historically high growth rates with respect to population and family unit creation. He continues with stating that, as of 2000, 22 million households existed in Mexico, with a forecast of 27 million by 2010. Moreover, there is rapid urbanization in the country. Mulas (2005) stated that, with both rising household levels and overall low average income levels, Mexico faces pressures that compromise the overall living standards of the population and its socio-economic development.

The owner occupation rate in Mexico was 78 percent as of year 1998 (http://www.housingfinance.org). Although the owner occupation rate is high in the country, Zaltzman (2003) stated that Mexico has a large housing deficit which is not being attended due to a rapidly growing population and the decreasing availability of funds. He adds that, in 2003 the Federal Government estimated a housing deficit of around 5 million homes in Mexico.

The earliest mortgage lenders in Mexico were mortgage banks. In 1914 mortgage banks' assets were approximately 1/7 of the commercial banks' assets. Mortgage banks appear to have been the largest private sector provider of housing finance

until the 1960s. Building societies and savings banks were created in the 1940s in Mexico, but they never had a significant place in the financial markets (Lea, 1995).

Considering the general characteristics of the mortgage system in Mexico, as it was stated before, government had played a major role in the housing finance system of the country. Over the years, government sponsored financing of low income housing has been channeled through multiple institutions. The first public housing finance institution Banco de Obras Publicas (BANOBRAS) (National Urban Mortgage and Public Works Banks) was created in 1933 to finance low-income housing. Then, in 1954, Fideicomiso del Fondo Nacional de Habitaciones Populares (FONHAPO) was created with a similar purpose (Zanforlin and Espinosa, 2008; Lea, 1995).

A government trust fund called as Fondo de Operación y Financiamento Bancario de la Vivienda (FOVI) was created in 1963 in order to provide low cost mortgages for low and middle income households. FOVI was funded by the central bank and the World Bank. It operated as a second tier bank, providing funding and guarantees (up to 45 percent of loss-given default) to the banks extending mortgages to targeted households and low cost housing developers (Zanforlin and Espinosa, 2008).

Instituto de Fondo Nacional de la Vivienda para los Trabajadores (INFONAVIT) and Fondo de la Vivienda para los Trabajadores al Servicio del Estado (FOVISSTE) were created as government-sponsored construction and housing development funding agencies in 1972. They have been funded by a mandatory contribution of 5 percent of gross wages. For decades they have been the main institutions of government-sponsored low-income housing finance. Indeed, INFONAVIT still has about half of the market in the primary mortgage market even though it was known for years with its passive collection practices and poor governance (Zanforlin and Espinosa, 2008).

Lea (1995) stated that the small size of the private mortgage market in Mexico is the outcome of years of repression of the financial sector in the country and the difficulties in managing credit risk. Zanforlin and Espinosa (2008) explained that, after the banking crisis of 1981, the banking sector was nationalized in 1982 and the banking losses were absorbed by the government. The authors also add the fact that in the early 1980s, government securities crowded out private credit instruments including mortgages and again during the high inflation period of the early 1980s, banks were authorized to issue dual index mortgages.

As a matter of fact, during the beginning of the 1990s, privatization of the banking sector led to very rapid growth in mortgages, but it did not immediately stimulate a private mortgage market. Dual index mortgages disappeared because of the continuous decrease in households' purchasing power, the consequent rapid increases in outstanding loan balances and associated increases in banks' default and market risks (Zanforlin and Espinosa, 2008). Lea (1995) also stated that since their privatization, the commercial banks have originated a greater new peso volume of mortgages than the government. However, their lending volume declined in 1994, even before the devaluation crisis, reflecting problems with mortgage portfolios. The author added that, the major problems have been with the performance of dual index mortgages and their lack of payment collection capabilities and systems. Additionally, Lea (1996-b) stated that, there were a number of legal and regulatory impediments to a well-functioning mortgage system in Mexico in those days, together with the lack of borrower information, accurate house price valuation, incomplete property registries, and ineffective foreclosure procedures.

In Mexico, mortgage lending by commercial banks increased from 1.3 percent of GDP to 2.4 percent of GDP between 1989 and 1994. But the sharp interest rate increases after the Tequila crisis of 1994 led to huge defaults in the adjustable rate mortgages of the early 1990s in addition to a public sector bail-out. After the crisis,

commercial banks almost entirely leaved the origination of real estate mortgages, and non bank financial institutions and public sector entities originated mortgages. In 1994, non-bank financial intermediaries that specialized in real estate mortgages called as SOFOLES were created mainly lending mortgages to low income households. Since SOFOLES were non-deposit taking institutions, their main source of funding was FOVI. FOVI was also acted as the supervisor of SOFOLES and determined the underwriting and service requirements (Zanforlin and Espinosa, 2008).

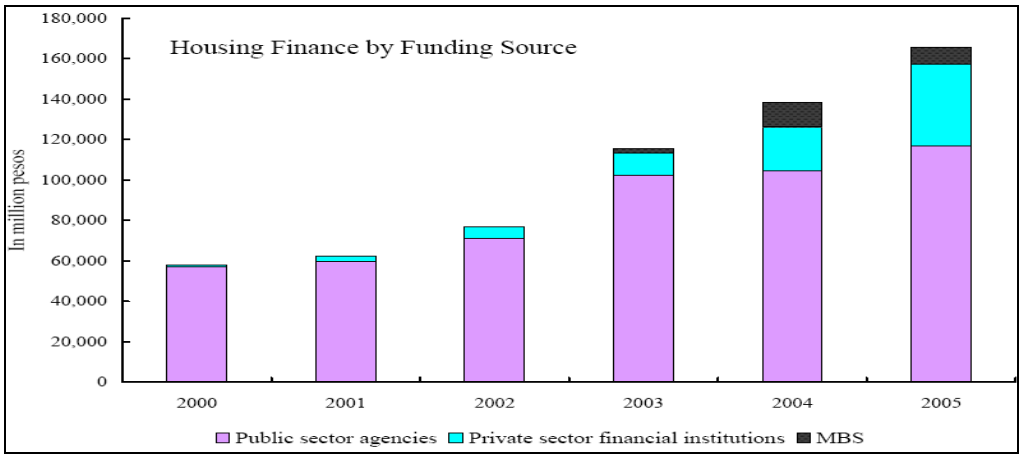
Zaltzman (2003) stated that, SOFOLES have been very successful in a market where banks have been almost absent after the 1995 Mexican banking crisis. With the backing of SHF and giving importance in meeting the housing finance needs of the low income population, SOFOLES have realized market share increases from 2 percent in 1996 to 20 percent in December 2002. SOFOLES had low delinquency rates compared to both current Mexican bank mortgages and international standards, and this is an important issue when the main target of the institution is considered. The success of SOFOLES is due to several factors such as the high efficiency in their collection methodologies, good underwriting standards, the nonconventional methods of servicing, and the quality of their management teams.

Currently, Mexico's mortgage system is composed of various private and government institutions. Private participation comes mostly from SOFOLES, which in turn are generally funded by SHF. Banks that left the mortgage market after the 1995 Tequila crisis are slowly coming back to the market. INFONAVIT and FOVISSSTE are government-sponsored mortgage institutions. SHF, which was created in 2002 as the successor to FOVI, is a government owned institution. SHF operates as a second-tier finance institution that provides liquidity and guarantees to first-tier lenders, mainly to SOFOLES (Mulas, 2005).

Zanforlin and Espinosa (2008) stated that as in the United States, the Mexican

secondary market was launched with the support of government sponsored initiatives. In Mexico, originators have been issuing directly mortgage-backed securities in the market and benefiting from credit enhancements provided by SHF in the form of financial guarantees to mortgage originators meeting SHF's origination standards. The authors also stated that, some features of the Danish secondary mortgage market have also attracted significant attention in Mexico. The most important feature of the Danish mortgage market is its high liquidity. Mexico has adapted the Danish technological platform which enabled mortgage originators to issue residential mortgage backed securities (RMBSs) closer to the Danish ones.

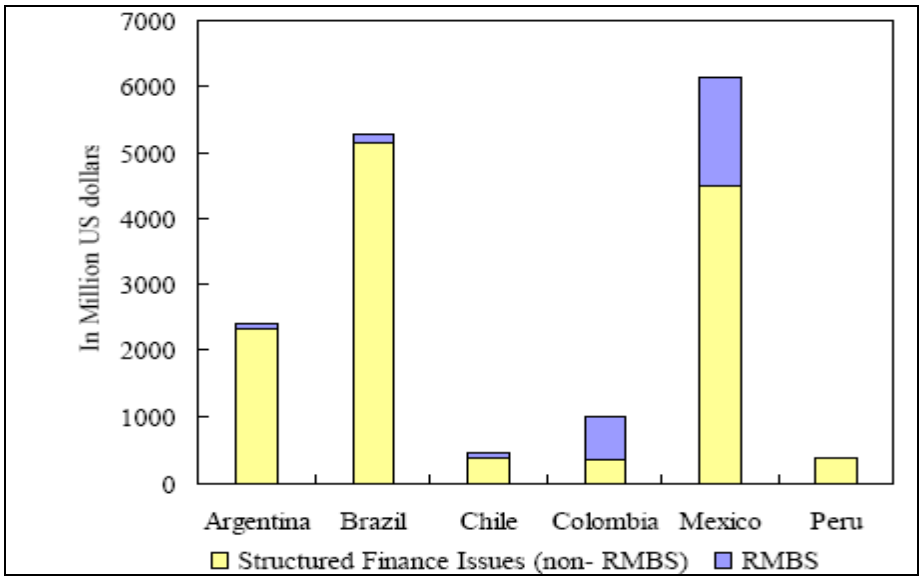
RMBSs appeared for the first time in late 2003 and by 2006 they had become the largest structured asset class, representing over 25 percent of total local structured issues in Mexico. As of October 2007, there were over 6.4 billion US dollars of residential mortgage backed securities outstanding in the Mexican bond market by seven different SOFOLES, two banks and INFONAVIT (Zanforlin and Espinosa, 2008). The following Figure 4.3 shows housing finance in Mexico by funding source. As the figure shows securitization started in Mexico in 2003 and it increased gradually in the following years. And as it can also be observed from the figure, public sector financing of housing is dominant in the country.



Source: Zanforlin and Espinosa, 2008

Figure 4.3 Housing Finance by Funding Source in Mexico

Additionally, the following Figure 4.4 shows the local issuance of securitized assets in several Latin American countries.



Source: Zanforlin and Espinosa, 2008

Figure 4.4 Housing Finance by Funding Source in Latin America

As it can be observed from Figure 4.4, Mexico has the largest residential mortgage backed (RMBS) security issues in Latin America. Much of this development is due to a strong political effort directed at offsetting a very large housing shortage and to a number of legislative reforms. As it was stated before, in 2001, the Mexican government established SHF. This development bank was created to grant loans and guarantees for the financing and construction of housing, and to help the securitization of mortgages issued by the financial intermediaries. As a result, SHF provided government guarantees, which are required in order to introduce RMBSs in secondary markets. However, by law, the SHF will not be allowed to fund financial intermediaries after 2009. This means that alternative methods to fund mortgages will have to emerge, and there are plans to develop a securitization market for mortgages as the main source of funding for the housing market in Mexico. Also, SHF will have to become self-supporting in October 2013 and the

fact that all the securities that SHF currently handles are fully backed by the federal government will have to change (Scatigna and Tovar, 2007).

Finally, it is important to note that, the impact of sustained macroeconomic management and effective control of inflation were quite beneficial on domestic interest rates in Mexico and the Mexican mortgage market is a successful example which had been closed with the 1995 crisis, but started to supply residential mortgage backed securities in 2003 (Renaud, 2005). As it was stated in the preceding paragraph, Mexico now has the largest residential mortgage backed security issues in Latin America. As stated by Warnock and Warnock (2008), the maximum mortgage debt to GDP ratio for the 2001 to 2005 period in Mexico is 11 percent.

4.2.2 Brazil: General Characteristics of the Mortgage System

Lima (1998) stated that, housing finance story in Brazil is very interesting. Brazil's case between 1964 to early 1980s period was a success story. However, 1983 to 1990 period can be viewed as a lesson of what has to be avoided to prevent a system from nearly collapsing. On the other hand, the recent past of the Brazil's mortgage system shows the introduction of a secondary mortgage market by the private sector.

Considering the macroeconomic background of Brazil, the country had a GDP of 1,834 billion US dollars in 2007. The average GDP growth rate in Brazil was 3.96 percent (OECD). According to the IMF, World Economic Outlook Database, annual percentage change in inflation was 3.64 percent in 2007 in Brazil.

Looking at the demographic structure of Brazil, the country had a population of 189,335 thousand in 2007 with an average population growth rate of 1.56 percent

(OECD). Aydın (2006) stated that, 82 percent of Brazil's population lives in urban cities. The estimated housing deficit in the country is 7 million, with a 3 percent rising rate every year despite the construction of 1.1 million dwelling units.

The owner occupation rate in Brazil was 74 percent as of year 1998 (http://www.housingfinance.org). Owner occupancy rate is high in the country, but like other developing countries, direct financing constitutes the largest portion (73 percent) of housing finance (Aydın, 2006). Institutional housing finance is very low in the country, and it should also be noted that the formal system of housing finance largely serves the middle and upper income groups, while the poorest sections of the community use informal sources of finance (Boleat, 1985).

Hayward (2007) stated that in a situation of uncontrolled inflation and high interest rates, the Brazilian mortgage sector has received no long-term investment for two decades. In 2006, the Brazilian mortgage market was worth 5.36 billion US dollars which was only 2.2 percent of GDP. Compared with other Latin American countries such as Chile, where residential mortgages account for 15 percent of GDP, or Mexico at 11 percent, it is clear that Brazil has to increase the issuance of mortgages.

Lima (1998) summarized the introduction of the housing finance system in Brazil by stating that, in 1964, the Housing Finance System was introduced to provide medium to long-term financing for the construction or purchase of residential units for the low and middle income population. Indexed mortgages were made in Brazil which was also introduced in 1964 to prevent the erosion of loans by inflation.

The Housing Finance System in Brazil used two basic funding sources: (1) savings deposits held in the financial institutions authorized by the Central Bank of Brazil to make mortgages available with such funds; and (2) mandatory deposits made by employers in accounts held in the names of their employees in the Fundo de

Garantia do Tempo de Servico (FGTS). FGTS was a workers' compensation fund administered by the Federal Savings Bank. These deposits had interest rates of 0.5 and 0.25 percent per month respectively together with the indexation (Lima, 1998).

In that period, the housing finance system of Brazil was a successful example for developing countries and especially for other Latin American countries. However, the high amount of foreign debt that the country had towards the middle of the 1980s, had given rise to negative changes in macroeconomic balances and caused the fall of reel incomes and resources in the country (Alp, 2000).

As a result of the macroeconomic problems in Brazil, the Housing Finance System of the country had suffered a lot. The transfer of mandatory deposits made by employers to savings and loan institutions for housing finance was stopped because these funds were started to be used to cover budget deficits especially in the period of 1984 to 1988. Since the lending institutions were forced to finance mortgages with deposits, the issuance of mortgages had rapidly declined. Furthermore, the length of the foreclosure processes in that period also forced the banks to be very selective in their lending activities (Aydın, 2006).

Macroeconomic stabilization was achieved again in Brazil with the implementation of the Brazil's Real Plan in July 1994, which was named for the new currency introduced under the plan. With the achievement of the macroeconomic stabilization, poverty had declined in the country. The main elements of the Real Plan were the introduction of a new currency (the real); the deindexation of the economy; an initial freeze of public sector prices; the tightening of monetary policy; and the floating of the currency (Clements, 1997). Macroeconomic stabilization also enabled the development of new sources for mortgage financing. Implementation of a secondary mortgage market in the country was eased (Rocha, 2000).

In Brazil, mortgages were issued by the financial institutions authorized by the

Central Bank to raise savings deposits. There were 41 such institutions, including the Federal Savings Bank (Caixa Econômica Federal) and one savings and loan association. The remaining financial institutions were private or state-government owned multi-chartered banks. Mortgages were also originated by the Federal Savings Bank and by state or local-government-run housing companies and by private and public housing cooperatives with FGTS resources (Rocha, 2000).

The secondary mortgage market in Brazil was introduced with the Law numbered 9514 on November 20, 1997. The Law established a comprehensive legal framework for changing the structure of the Brazilian mortgage system, principally through the introduction of a new securitization vehicle that will improve liquidity in the mortgage market and the creation of securitization companies. The Law also had streamlined the foreclosure processes by significantly reducing the time needed to seize and liquidate the property of defaulting borrowers (Lima, 1998; Dubitsky and Posch, 1998).

CIBRASEC was created on July 31, 1997, which had been designed to play the role of Fannie Mae or Freddie Mac of US in Brazil. Its main role was to purchase mortgages from mortgage companies, banks, real estate credit companies, savings banks and savings and loan associations and to issue securities backed by those mortgages. These securities were called as CRIs (Certificados de Recebíveis Imobiliários). The main investors in these securities were pension funds, insurance companies, investment funds and foreign investors (Lima, 1998; Rocha, 2000).

Despite this broad, flexible and robust legal framework, it took two years for the first issuance of residential mortgage backed securities in Brazil. In 1999, CIBRASEC issued 9 million US dollars of CRIs. There were two main reasons of the low volume of securities issued during this period. The first one was the lack of knowledge of the local investor community as to how to analyze and price these securities. While the local investor community has increased knowledge over the

years, the second factor, the lack of standardization among originators, still persists (Uqbar, 2007). According to Scatigna and Tovar (2007), residential mortgage-backed securities (RMBSs) and commercial mortgage-backed securities (CMBSs) have exhibited a volatile trend and remain underdeveloped in Brazil. They represented only 9 percent of all structured transactions executed in 2006. Most of the transactions in this segment are represented by CRIs that are issued by the securitization companies (Scatigna and Tovar, 2007).

4.2.3 Colombia: General Characteristics of the Mortgage System

Similar to many other developing countries, Colombia had faced a strong financial crisis in the late 1990s. During the crisis, there was a noticeable and prolonged credit contraction in the mortgage market. The stock of mortgages in the country fell by 70 percent in real terms between December 1998 and December 2005. Recovery in the amount of mortgages issued was seen only 7 years after the crisis. This recovery happened with a sharp decline in the mortgage interest rates (Galindo and Hofstetter, 2007).

Since the financial crises in 1998-1999, Colombia had adopted a fixed interest rate mortgage system. In this system there were no prepayment penalties. However, due to the lack of sufficient competition among mortgage banks and high delinquency rates, floating around 20 to 25 percent during 2000 and 2003, interest rates were high in Colombia ranging between 8 to 13 percent annually (Clavijo et.al, 2005).

Considering the macroeconomic background of Colombia, the country had a GDP of 208 billion US dollars in 2007. Again in 2007, the average GDP growth rate in the country was 7.6 percent. On the other hand, the annual percentage change in Colombia's consumer price index in 2007 was 5.5 percent (IMF, World Economic Outlook Database, and October, 2009).

Looking at the demographic structure of Colombia, the country had a population of 47.5 million in 2007 (IMF, World Economic Outlook Database, and October, 2009). Housing deficit in Colombia is 15 percent (Aydın, 2006).

Clavijo et.al (2005) stated that, owner occupation rate in Colombia was 58 percent in 1998. Behind this relatively high ownership rate of the late 1990s, there are other housing statistics indicating that home ownership does not necessarily translate into the well being of the majority of Colombians. For instance, the ratio of mortgage debt to GDP was only 5 percent in 2004. This is a sign that ownership actually comes from informal construction processes.

Regarding the general characteristics of the mortgage system in Colombia, it can be said that the evolution of the mortgage system in Colombia can be divided into two periods. The first period started with the creation of the two government owned mortgage banks. Banco Agricola Hipotecario was established in 1924 and Banco Central Hipotecario (BCH) was established in 1932. This first period ended at the beginning of the 1970s. During this first period, government was the main source of long-term mortgages in the country, and resources used for lending came primarily from the government's national budget and from forced investments by other private financial institutions. This system led to negative real interest rates for deposits, which, in turn, reduced the availability of savings, especially during the 1970's when inflation started to increase. So, this situation started the second main period in the evolution of the system (Gomez et.al, 2005).

In the second period, started in 1972, a mortgage system called as the UPAC (Unit of Constant Purchasing Power) was created in Colombia. This system involved specialist organizations known as saving and housing corporations (CAV). The UPAC System was a long-term mortgage system that was based on mortgages of up to 15 years. The UPAC System was also based on monetary unit indexing. The Law that created this system gave CAVs very special privileges, since they were the only

organizations that could grant this type of mortgage, use the indexing unit (UPAC), and pay returns on savings using this adjustment system. Special credit lines were also created, through which the Central Bank of Colombia could automatically provide cash to CAVs (Forero, 2004).

Government of Colombia had passed an important financial reform aimed at liberalizing financial activities and increasing competition in the sector in 1990. The law eliminated the mortgage market monopoly in the country and allowed competition between the banks and the CAVs for short-term loan funds. In the following years after the reform, the housing sector experienced a growth, during which housing construction grew faster than the economy as a whole and construction's share of GDP rose from 3.9 percent in 1990 to 5.1 percent in 1994. Housing finance also experienced a growth starting in 1993, mainly due to an increase in the inflow of foreign capitals. Mortgage debt as a percentage of GDP showed a sharp increase from around 6 percent in 1992 to 11 percent in 1998, one of the highest in the region at the time (Gomez et.al, 2005).

However, these favorable conditions did not last long, because a crisis had begun in 1998, with a strong setback in the inflow of foreign capital, an increase in interest rates, asset price deflation and a rise in unemployment. Given the high level of indebtedness at the time, borrowers' payment capacity quickly eroded and, consequently, the quality of the mortgage portfolios deteriorated significantly. The indexation mechanism of the UPAC increased the effect of the increase in interest rates, making the situation unsustainable for the borrowers (Gomez et.al, 2005).

In response to this situation, the UPAC system was ended and government enacted a new housing law. Housing Law 546 was passed on December 1999, and it introduced a new indexation mechanism based on inflation called as the Unidad de Valor Real (UVR). As a result of the new legislation, UPAC portfolios were converted to UVR and a number of important reforms were introduced. The main

reforms included: (i) the conversion of CAVs into banks, (ii) standardization of mortgages, (iii) creation of a new social housing (vivienda de interes social – VIS) policy that included subsidies and a requirement for banks to dedicate a portion of their mortgages to social housing, and (iv) creation of institutions and instruments for a secondary mortgage market (Gomez et.al, 2005).

An important development in terms of the mortgage system in Colombia has been the introduction and the growing use of mortgage securitization, through the issuance of mortgage-backed securities (MBS). In 2001, Titularizadora Colombiana was created as the first entity specializing in mortgage securitization in the country and, since then, it has performed eight mortgage securitizations totaled to 1.5 billion US dollars. Approximately 30 percent of the country's mortgage portfolio was securitized in 2005 and MBS have gained a place in the secondary market. As a result, Colombia is the country that presents the greatest development in terms of mortgage securitization in Latin America (Gomez et.al, 2005).

CHAPTER 5

SOCIO-ECONOMIC AND MACROECONOMIC STRUCTURE OF TURKEY AND DEVELOPMENT STAGES OF MORTGAGE SYSTEM

5.1 Introduction

After an overview of mortgage systems from some developed and developing countries, the structure of the housing finance system in Turkey is explained here.

Housing is a problematic issue for Turkey due to the imbalance between housing demand and supply in the country. In general, housing supply is less than demand, so the problem of housing deficit occurs. Additionally, because the demand is higher than the supply, affordability of housing gets harder in the country due to the higher prices. Moreover, Turkey has an increasingly growing population and rapid urbanization that both increase the deficit of housing. Accordingly, many poor people have to live in unauthorized houses near metropolitan cities. This both decreases the quality of life for those people and leads to unhealthy urbanization in the country.

Turkey, similar to most of the high inflation economies, does not have a well-functioning housing finance system. As Akçay (2003) states, it is expected that, a well-functioning housing finance system increases housing supply and improves housing quality. This expectation requires setting up a balanced relation among government, financial institutions, house builders, and households. Government has a significant role in this process and it should take some measures to set up a system that will be able to move funds from the capital markets to the housing markets and it should prepare the necessary regulations for this system to function

effectively and efficiently. As a matter of fact, government has prepared most of the regulations needed for the establishment of a mortgage system in Turkey and the new law called as the "Law Amending the Laws Related to Housing Finance System" has passed through the Parliament in February 2007. This new law would help decrease the barriers to create a well-functioning mortgage system in Turkey.

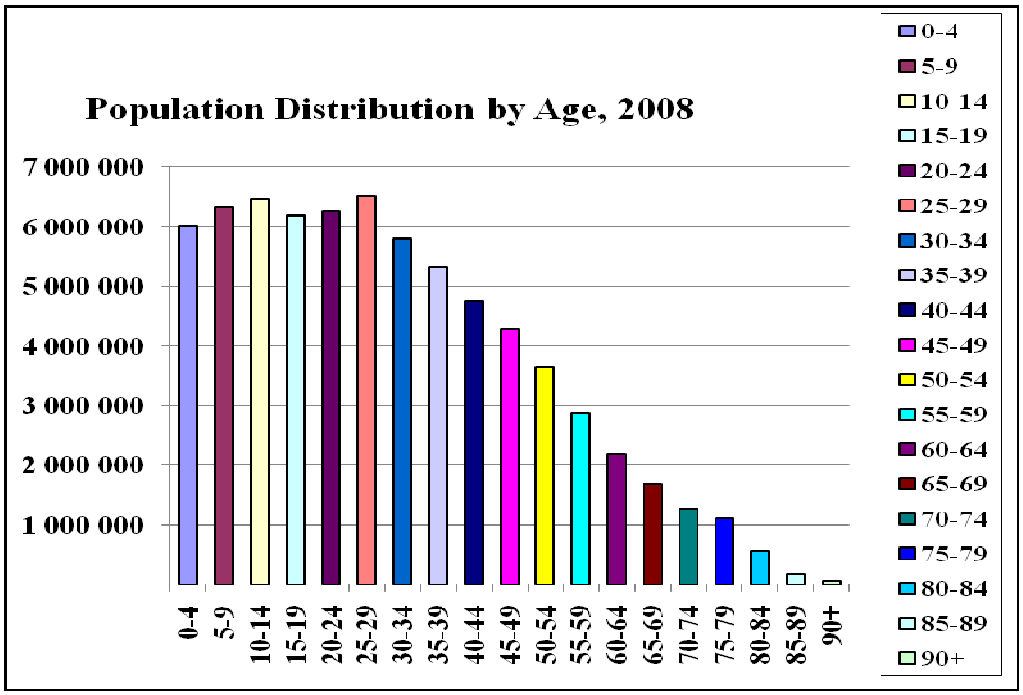
In the following sections, firstly the demographic structure and then the general character of the Turkish housing demand and supply is explained. Then, the general character of the Turkish macroeconomic environment and the structure of the financial sector in the country are given. After, general description of the ways in which households finance housing in Turkey is given and finally the adaptation of mortgage system in Turkey is explained.

5.2 Demographic Structure of Turkey

According to OECD statistics, Turkey has a population of 73,875,000 in 2007 with a population growth rate of 1.87 percent. The age distribution of the population needs attention because approximately 61 percent of the population is below the age of 35. This means that there will be an increasing need for housing in the future. Figure 5.1 below shows the population distribution of Turkey by age in 2008. Moreover, the marriage rate is increasing very rapidly in the country. Figure 5.2 below shows the crude marriage rate per ten thousand between 1979 and 2007 in Turkey. As the graph shows there is an explicit increasing trend in the marriage rates starting from 2002.

On the other hand, the trend towards diminishing household sizes is another demographic factor that further imbalances the supply-demand equilibrium (Özsan and Karakaş, 2005). Turkish households are crowded and the decrease in household sizes necessitates more housing supply. Table 5.1 below shows the total number and

the average size of households in Turkey. The table shows clearly that the number of households is increasing and the average size of households is decreasing.



Source: Turkish Statistical Institute

Figure 5.1 Population Distributions by Age in Turkey

Source: Turkish Statistical Institute

Figure 5.2 Crude Marriage Rate in Turkey (per ten thousand)

Table 5.1 Total Number and Average Size of Households in Turkey

Year	Total Number of Households	Average Size of Households
1955	5,237,176	5.68
1960	4,558,325	5.68
1965	5,536,116	5.67
1970	6,261,949	5.69
1975	6,982,505	5.78
1980	8,522,499	5.25
1985	9,730,018	5.21
1990	11,118,636	5.05
2000	15,070,093	4.50

Source: Aydın, 2006

Another issue to be considered about the housing finance in Turkey is the rapid urbanization in the country. Since the 1950s, the urbanization has amplified in the country and the population in the urban cities has started to increase. Table 5.2 below shows the increasing urban population and the rising proportion of urban population to total population in the country.

Table 5.2 Urban Population Growth in Turkey

Year	Urban Population	Total Population	Urban Population as a Percentage of the Total Population (%)
1927	3,305,879	13,648,270	24.22
1935	3,802,642	16,158,018	23.53
1940	4,346,249	17,820,950	24.39
1945	4,687,102	18,790,174	24.94
1950	5,244,337	20,947,188	25.04
1955	6,927,343	24,064,763	28.79
1960	8,859,731	27,754,820	31.92
1965	10,805,817	31,391,421	34.42
1970	13,691,101	35,605,176	38.45
1975	16,869,068	40,347,719	41.81
1980	19,645,007	44,736,957	43.91
1985	26,865,757	50,664,458	53.03
1990	33,326,351	56,473,035	59.01
2000	44,006,274	67,803,927	64.90

Source: Turkish Statistical Institute

According to Karakaş and Özsan (2005), the rising urbanization in the country led to significant socioeconomic problems, and rapidly increased the investment requirements in urban infrastructure. For example, at the end of 2000, 23 percent of the total population was settled in Istanbul, and 44 percent of the total urban population was settled in cities whose population was over one million. In addition the authors stated that, adequate urban housing supply could never keep up with the demand in Turkey. Moreover, the situation is complicated in the country because, 90 percent of Turkey's land is under serious earthquake risk, and an estimated 40 percent of the urban housing stock necessitates serious structural strengthening.

Considering the affordability of housing in Turkey, it can be said that affordability of housing is not easy by the poor and middle income group of the population. Income is not equally distributed in Turkey. Table 5.3 below shows the income distribution of households in Turkey. When households are listed according to their disposable incomes from the ones with the highest income to the lowest income and divided into five equal parts, the lowest income group is defined as the fifth quintile and the highest income group is defined as the first quintile. As a matter of fact, the first quintile that is 20 percent of the population with the highest disposable income had 46.9 percent of income in 2007. This was 8.1 times the income that the poorest people had earned in the country.

Table 5.3 also shows the gini coefficient for Turkey as a whole and for urban and rural areas separately. According to the gini coefficient, which is one of the criterions used in the measurement of income equality, there was an improvement in income distribution in 2007 compared to 2006. Gini coefficient represents inequality in income distribution when it approaches to 1 and it represents equality in income distribution when it approaches to 0. Gini coefficient was 0.43 in 2006 and it decreased by 0.02 point in 2007 to 0.41. So, in 2007, the coefficient got closer to 0 indicating an improvement in equality. The Gini coefficient was 0.39 for urban areas and it was 0.38 for rural areas in 2007.

Table 5.3 Household Incomes by Quintiles in Turkey, 2006-2007

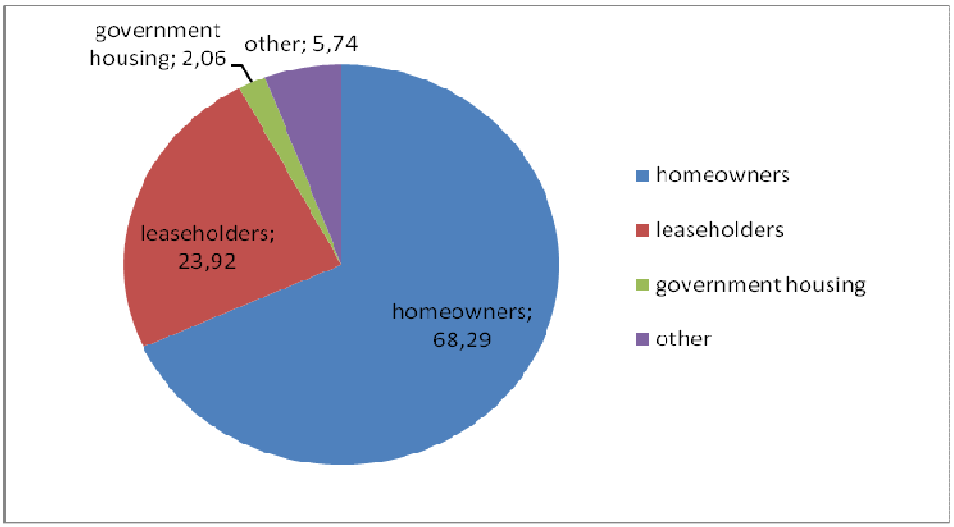
QUINTILES			URBAN		RURAL	
	2006	**2007**	**2006**	**2007**	**2006**	**2007**
Total	100.0	100.0	100.0	100.0	100.0	100.0
First	5.1	5.8	5.5	6.2	5.6	6.4
Second	9.9	10.6	10.3	11.0	10.2	11.1
Third	14.8	15.2	15.0	15.3	15.3	16.0
Fourth	21.9	21.5	21.8	21.2	22.6	22.3
Fifth	48.4	46.9	47.5	46.2	46.3	44.2
Gini Coefficient	0.43	0.41	0.42	0.39	0.41	0.38

Source: Turkish Statistical Institute

It is important to provide affordable housing to every segment of the population. Under current economic conditions, low income groups cannot acquire quality houses with favorable terms and conditions. Only those people who take the biggest share from the income distribution are able to use housing loans to finance their housing needs (Turhan, 2008).

As it was shown in Table 5.1, there were 15,070,093 households in Turkey in 2000. Additionally, the rate of homeowners among the total number of households was 68.29 percent in the same year. On the other hand, there were 3,604,367 leaseholders that were 23.92 percent of the total households. In addition, 2.06 percent of total households were living in government housing whereas 5.74 percent of households neither owned a house nor held a lease. Figure 5.3 below shows the general view of the ownership status of the households living in Turkey.

Karakaş and Özsan (2005) stated that, although the homeownership rate seems to be satisfying in Turkey, this rate includes illegal squatter housing, summer homes, second homes, and dwellings without a permit that constitutes more than 50 percent of homeowners.



Source: Turkish Statistical Institute

Figure 5.3 Ownership Statuses of the Housing Units in Turkey

5.3 Housing Demand and Supply in Turkey

Depending on the population growth rate in Turkey, the country needs 500,000 new housing on the average annually. According to the 2008 data, the total housing stock in the country was 15 million. However, 55 percent of this housing stock consisted of illegal and unauthorized dwellings. Moreover, 60 percent of the dwellings are over the age of 20, and 40 percent of them requires maintenance and improvement towards being more resistant to earthquakes. These facts clearly show that Turkey is in need of qualified housing and currently it does not have an adequate number of qualified housing that the households demand in the country.

Looking at the supply side of housing in Turkey, it can be seen that the housing supply is less than the housing demand in the country. The housing supply in the country is shown in the following Table 5.4 as the number of flats with occupancy permits between 1997 and 2007, where the number of flats with construction permits shows the housing demand.

Table 5.4 Supply and Demand of Dwelling Units in Turkey

Year	Number of dwelling units with construction permits	Number of dwelling units with occupancy permits
1997	464,117	277,056
1998	432,599	238,958
1999	339,445	216,513
2000	315,162	245,155
2001	279,616	243,464
2002	161,920	161,376
2003	202,854	162,781
2004	330,446	164,734
2005	546,618	249,337
2006	600,387	294,278
2007	584,955	325,255

Source: Turkish Statistical Institute; Gürbüz, 2002; Aydın, 2006

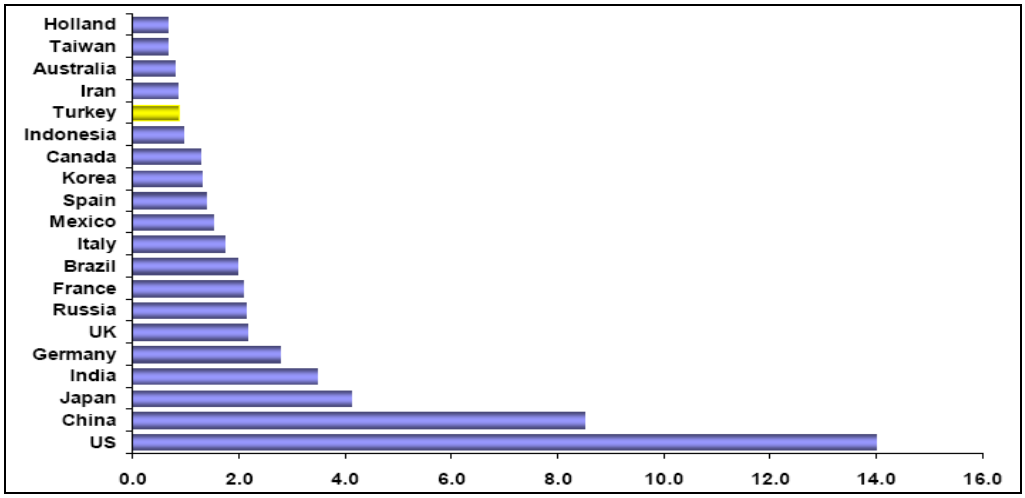
According to Özsan and Karakaş (2005), due to the earthquake in the Marmara region in 1999 and the economic crises in Turkey in years 2000 and 2001, housing production have significantly declined in the country as also shown in Table 5.4. There were two main reasons for the sharp decrease in the housing production figures; one of them is that the government temporarily ceased issuing construction and occupancy permits and the other one is the significant decrease in the purchasing power of nearly 80 percent of the population.

On the other hand as shown in Table 5.4, the number of dwelling units with construction permits started to increase in 2004. This actually shows the rising demand for housing in the country. However, the number of dwelling units with occupancy permits is approximately the half of the number of dwelling units with construction permits in the same years which is a sign that the housing supply is

less than the housing demand in the country assuming that the number of dwelling units with occupancy permits shows the supply of housing in Turkey.

5.4 Macroeconomic Environment and Structure of Financial Sector in Turkey

Turkey is one of the biggest economies of the world with a GDP of 960.3 billion US dollars in 2007. Figure 5.4 below shows the world's biggest economies.

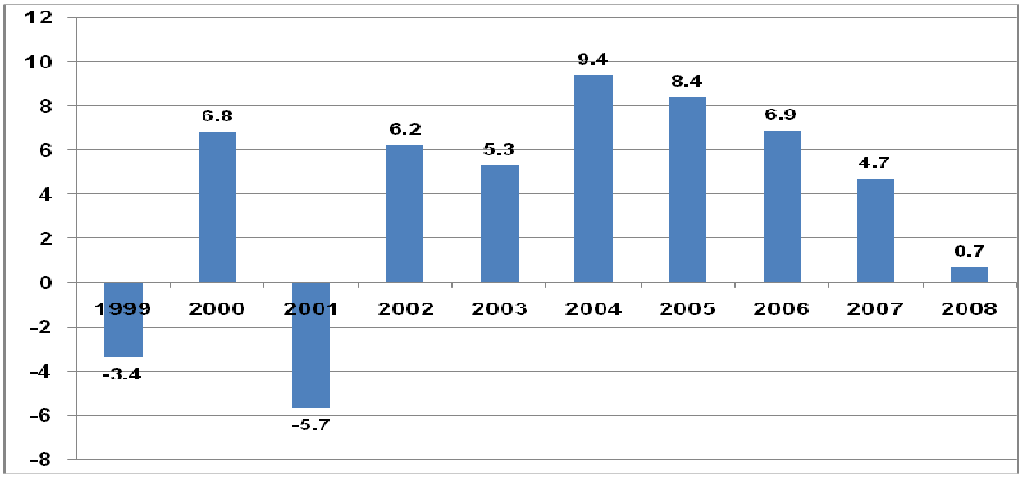


Source: Undersecretariat of Treasury

Figure 5.4 GDP of the World's Biggest Economies (based on purchasing power parity, in trillion dollars)

Turkey had an average GDP growth rate of 5.9 percent between 2002 and 2008. The following Figure 5.5 below shows the annual GDP growth rates for Turkey between 1999 and 2008. As it can be observed from the figure, in 1999, Turkey had a negative GDP growth rate due to the negative effect of the 1998 Asian crisis to the Turkish economy. Then, in 2000, GDP growth rate had increased due to the implementation of anti-inflationary government policies in that period. However, in 2001, GDP growth rate again declined to -5.7 percent, because of the February 2001 crisis in Turkey. Then, 2004 was a successful year for Turkey with the highest GDP

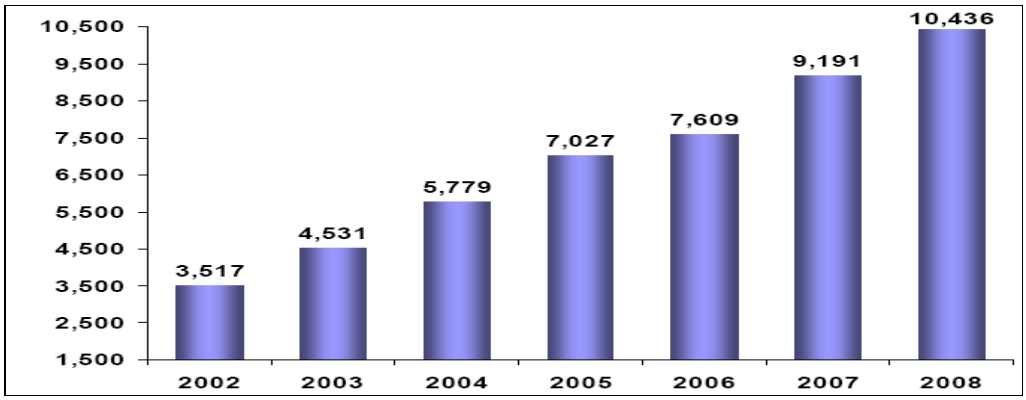
growth rate of 9.4 percent between 1999 and 2008. In 2008, the growth rate dropped to 0.7 percent from 4.7 percent in 2007, because of the negative impact of the global economic crisis on the Turkish economy. According to Undersecretariat of Treasury, GDP growth rate is targeted to increase to 3.5 percent in 2010 and to 4.0 percent in 2011 in Turkey.



Source: Turkish Statistical Institute

Figure 5.5 GDP Growth Rate of Turkey (in percentages)

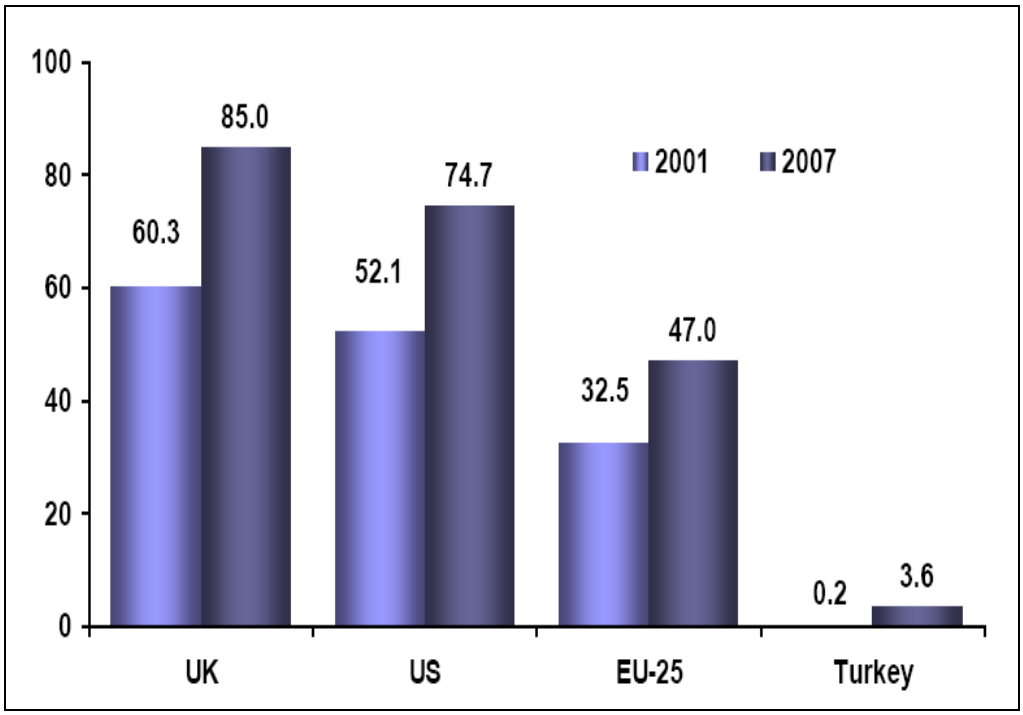
Further, GDP per capita was increased to 10,436 US dollars in 2008 from 9,191 US dollars in 2007. Figure 5.6 below shows GDP per capita between 2002 and 2008.



Source: Undersecretariat of Treasury

Figure 5.6 GDP per Capita in Turkey (in USD)

After the explanations about the GDP of Turkey, it is suitable to look at the housing loans as a percentage of GDP. Although Turkey has a large economy, in terms of housing finance it is not sufficient. Figure 5.7 below shows the housing loans as a percentage of GDP in 2001 and in 2007 for United States, European Union, United Kingdom, and Turkey.



Source: Undersecretariat of Treasury

Figure 5.7 Total Housing Loans as a Percentage of GDP

As it was mentioned before, one reason for Turkey to have a low ratio of housing loans to GDP is the existence of high inflation in the country. The following table shows the annual percentage change in the consumer price index for Turkey from January 1983 to May 2009. As the table shows inflation had started to decline starting in 2003. This had increased the number of mortgages granted in the country. Moreover, Karakaş and Özsan (2005) stated that, falling interest rates due to falling inflation after 2003 had increased the demand for housing and created increase in house prices above average consumer price rates.

Table 5.5 Annual Percentage Change in the Consumer Price Index (CPI) in Turkey between Jan.1989 and May 2009

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1989	62.50	64.13	60.24	60.22	59.58	61.48	63.77	65.59	65.15	66.07	64.51	64.28
1990	60.04	59.49	62.82	63.45	63.60	62.55	56.29	54.83	59.32	60.31	61.31	60.41
1991	61.99	63.54	62.27	62.15	62.45	64.88	68.60	70.96	66.85	66.47	66.85	71.14
1992	78.50	77.84	78.69	73.99	69.86	65.79	65.80	65.54	67.67	69.18	68.59	65.97
1993	59.77	58.16	58.01	58.97	65.03	67.24	73.12	71.20	68.25	67.20	69.62	71.08
1994	69.65	72.96	73.65	107.45	117.81	115.84	109.35	108.05	111.13	116.27	119.73	125.5
1995	125.89	122.42	119.67	88.41	79.81	80.73	80.63	83.25	85.84	84.21	81.53	76.05
1996	78.11	77.49	79.34	80.83	82.93	82.86	81.20	81.93	79.32	79.59	80.38	79.76
1997	75.72	77.65	77.30	77.16	77.46	78.05	85.23	87.79	89.86	93.16	95.82	99.09
1998	101.62	99.25	97.18	93.57	91.37	90.55	85.35	81.43	80.43	76.64	72.77	69.73
1999	65.90	63.93	63.54	63.85	62.97	64.27	65.00	65.40	64.27	64.70	64.55	68.79
2000	68.88	69.75	67.90	63.82	62.67	58.62	56.21	53.17	48.96	44.44	43.76	39.03
2001	35.92	33.42	37.51	48.27	52.39	56.10	56.33	57.50	61.80	66.47	67.29	68.53
2002	73.16	73.08	65.11	52.72	46.22	42.60	41.28	40.24	37.05	33.45	31.77	29.75
2003	26.38	27.01	29.41	29.45	30.74	29.76	27.44	24.91	23.00	20.78	19.25	18.36
2004	16.22	14.28	11.83	10.18	8.88	8.93	9.57	10.04	9.00	9.86	9.79	9.32
2005	9.23	8.69	7.94	8.18	8.70	8.95	7.82	7.91	7.99	7.52	7.61	7.72
2006	7.93	8.15	8.16	8.83	9.86	10.12	11.69	10.26	10.55	9.98	9.86	9.65
2007	9.93	10.16	10.86	10.72	9.23	8.60	6.90	7.39	7.12	7.70	8.40	8.39
2008	8.17	9.10	9.15	9.66	10.74	10.61	12.06	11.77	11.13	11.99	10.76	10.06
2009	9.50	7.73	7.89	6.13	5.24							

Source: Undersecretariat of Treasury

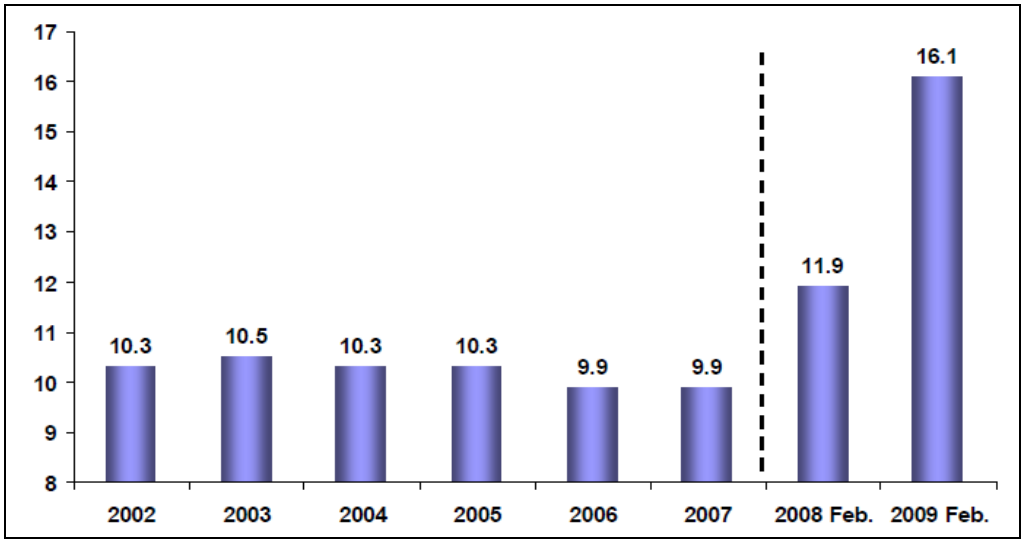
The following table shows the monthly percentage changes in the consumer price index (CPI) and the housing prices between January 2002 and May 2009. As the table shows starting from the middle of 2003, housing prices got above the average consumer prices. This shows the increasing demand for housing. Considering February 2009, it can be seen from the table that there is a decrease in house prices below the consumer prices. The reason could be the decreasing demand for housing in this period. Actually due to the effects of the global financial crisis in this period, households' overall consumption has decreased almost in every area.

Moreover, the unemployment rate in Turkey is increasing and this decreases the inflation in the country. Figure 5.8 shows the unemployment rate in Turkey between 2002 and 2009.

Table 5.6 Monthly Percentage Changes in the CPI and the Housing Prices

2002	CPI	Housing	2003	CPI	Housing	2004	CPI	Housing
1	5.32	2.71	**1**	2.58	2.84	**1**	0.74	1.17
2	1.77	1.86	**2**	2.26	1.37	**2**	0.55	1.43
3	1.18	1.91	**3**	3.10	1.59	**3**	0.88	0.38
4	2.05	1.50	**4**	2.09	0.60	**4**	0.59	0.48
5	0.58	1.68	**5**	1.58	0.89	**5**	0.39	1.15
6	0.59	2.09	**6**	-0.17	1.12	**6**	-0.13	0.89
7	1.44	2.11	**7**	-0.38	1.16	**7**	0.22	1.15
8	2.17	2.15	**8**	0.16	1.20	**8**	0.58	1.24
9	3.49	3.47	**9**	1.91	2.57	**9**	0.90	2.00
10	3.28	2.65	**10**	1.42	1.39	**10**	2.20	1.60
11	2.91	1.97	**11**	1.61	1.08	**11**	1.50	1.20
12	1.65	1.59	**12**	0.88	1.42	**12**	0.45	0.90
2005	**CPI**	**Housing**	**2006**	**CPI**	**Housing**	**2007**	**CPI**	**Housing**
1	0.55	0.67	**1**	0.75	1.27	**1**	1.00	1.18
2	0.02	0.51	**2**	0.22	1.22	**2**	0.43	0.49
3	0.26	1.08	**3**	0.27	0.60	**3**	0.92	0.40
4	0.71	0.38	**4**	1.34	0.21	**4**	1.21	0.27
5	0.92	-0.30	**5**	1.88	0.50	**5**	0.50	0.37
6	0.10	0.57	**6**	0.34	2.18	**6**	-0.24	0.39
7	-0.57	0.87	**7**	0.85	1.76	**7**	-0.73	0.55
8	0.85	0.91	**8**	-0.44	1.18	**8**	0.02	0.70
9	1.02	1.80	**9**	1.29	1.02	**9**	1.03	0.97
10	1.79	1.47	**10**	1.27	1.29	**10**	1.81	0.65
11	1.40	1.05	**11**	1.29	1.30	**11**	1.95	4.01
12	0.42	0.44	**12**	0.23	0.71	**12**	0.22	0.97
2008	**CPI**	**Housing**	**2009**	**CPI**	**Housing**			
1	0.80	4.26	**1**	0.29	0.70			
2	1.29	0.39	**2**	-0.34	-0.99			
3	0.96	0.37	**3**	1.10	-0.12			
4	1.68	0.72	**4**	0.02	-1.04			
5	1.49	0.41	**5**	0.64	-1.91			
6	-0.36	1.30						
7	0.58	5.34						
8	-0.24	2.12						
9	0.45	0.70						
10	2.60	3.79						
11	0.83	2.08						
12	-0.41	-0.53						

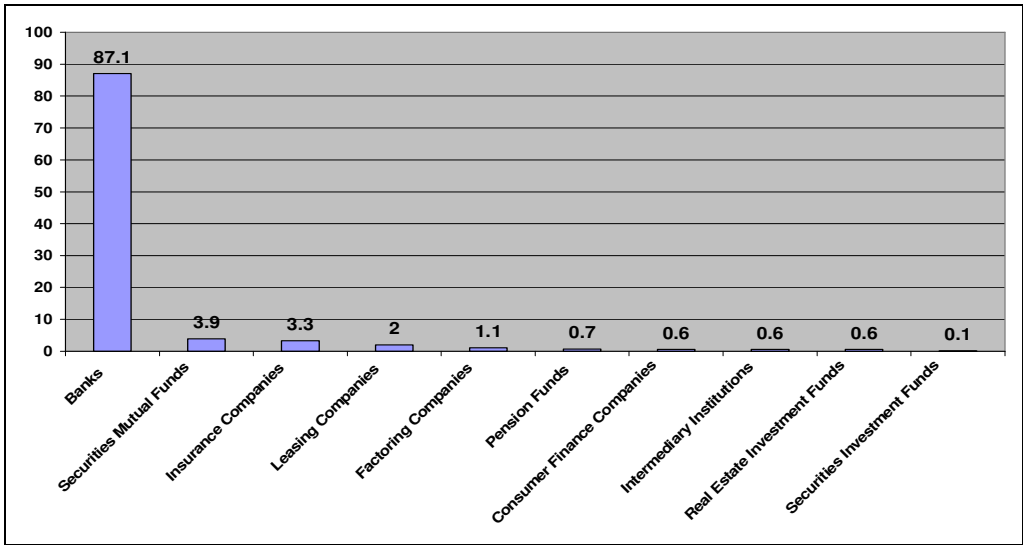
Source: Undersecretariat of Treasury



Source: Undersecretariat of Treasury

Figure 5.8 Unemployment Rate in Turkey (in percentages)

After this general overview of the macroeconomic environment in Turkey, the structure of the financial sector could be discussed. Firstly, it can be said that the Turkish financial sector is dominated by banks. The following figure shows the composition of balance sheet of the financial sector as of 2007.



Source: CBRT

Figure 5.9 Composition of the Turkish Financial Sector

The Turkish banking sector consists of deposit banks, development and investment banks and participation banks that operate according to profit/loss sharing principles The ratio of deposits and loans to GDP and the ratio of loans to deposits, which reveal the financial depth and intermediation level of the banking sector is shown in Table 5.7 below. As the table shows the ratios had increased in 2007 relative to the preceding years (CBRT, 2008).

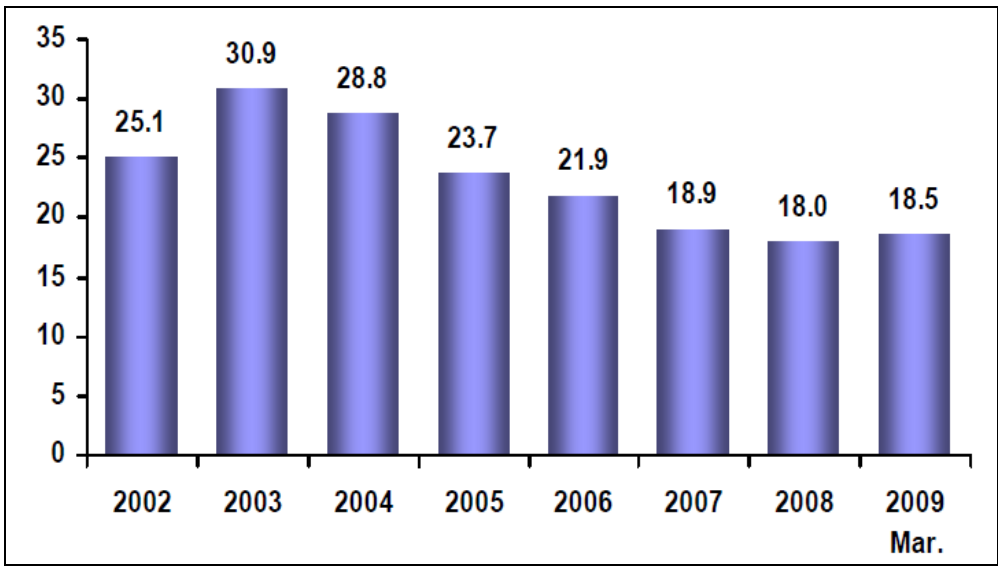
Table 5.7 Financial Depth and Intermediation Level Indicators of the Banking Sector in Turkey

Years	Deposits/GDP	Loans/GDP	Loans/Deposits
2003	35.1	17.2	49.1
2004	35.2	19.8	56.3
2005	38.8	25.3	65.3
2006	40.6	30.0	74.0
2007	41.7	34.6	82.9

Source: CBRT

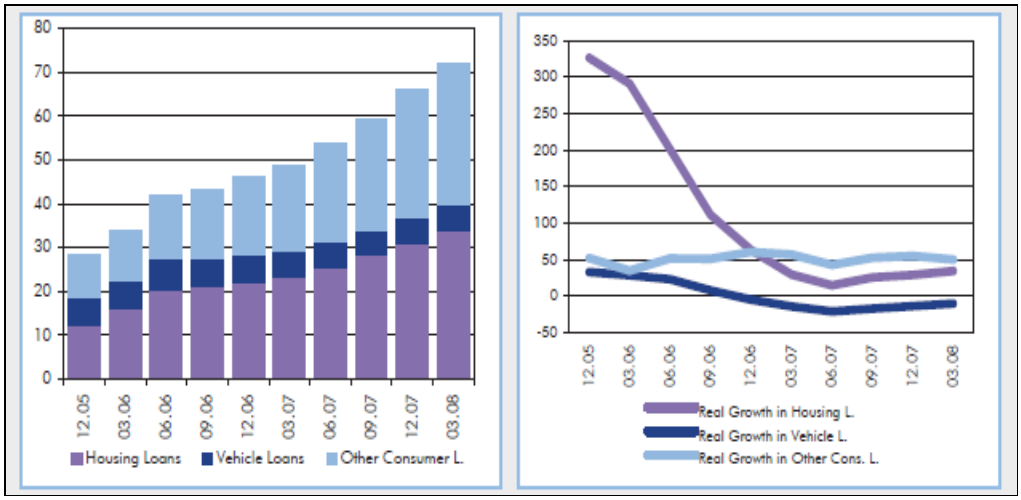
According to the financial stability report published by the Central Bank of the Republic of Turkey (CBRT) in May 2008, profitability performance of the Turkish banking sector improved in 2007 and the return on assets as well as on equity of the sector increased despite the high losses incurred by the developed international banks due to the global crisis. A slight decline was observed in profitability in March 2008. On the other hand, although the capital adequacy ratio of the sector followed a downward trend due to the increased credit volume and the regulations made within the framework of convergence to Basel II, it markedly stood above the minimum capital requirement of 8 percent and the target ratio of 12 percent. Figure 5.10 below shows the capital adequacy ratio of the banking sector in Turkey.

Furthermore, Figure 5.11 below shows the level of consumer loans granted by the Turkish commercial banks by type and their real growth rate.



Source: Undersecretariat of Treasury

Figure 5.10 Capital Adequacy Ratio of the Banking Sector in Turkey (in percentages)

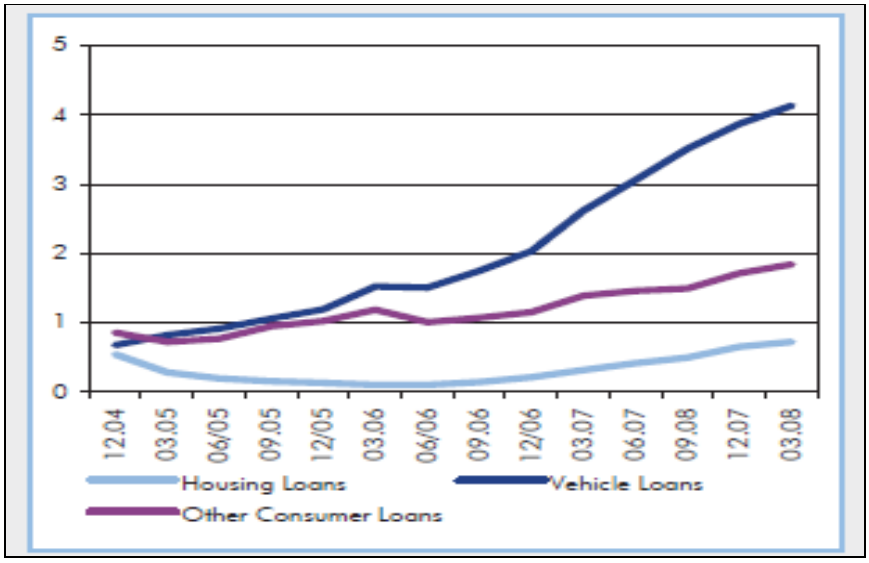


Source: CBRT

Figure 5.11 Consumer Loans by Type and Real Growth Rate

As it can be observed from Figure 5.11, the share of housing loans in total consumer loans is increasing**.** However, the real rate of increase in housing loans had dropped in 2007 relative to 2005.

Looking at the level of non-performing consumer loans, it can be seen that housing loans have the lowest non-performing loan (NPL) ratio. By March 2008, the NPL ratio of housing loans was realized as 0.7 percent. Figure 5.12 below shows the NPL ratios of consumer loans by type (CBRT, 2008).



Source: CBRT

Figure 5.12 Non-Performing Loan Ratios by Type (in percentages)

After these general explanations, it is suitable to explain why macroeconomic stability is very important for the development of a secondary mortgage market. First, it has a major effect on the demand for mortgages. Volatile economies have high rates of inflation and interest rates. These factors decrease the affordability of mortgages. On the other hand, the usage of fixed-rate mortgages in an inflationary environment creates a tilt effect in which the real payments on the mortgage are much greater in the early years of the mortgage. Variable rate mortgages can reduce the tilt effect but they make borrowers subject to potential shock and affordability issues. Indexed mortgages can improve affordability but they are complex for both borrowers and lenders. Moreover, the improvement of any instrument in terms of affordability may not be sufficient to stimulate demand if volatility creates uncertainty and short term investment horizons for the borrowers (Lea, 1999).

Furthermore, lenders are also reluctant to offer long term loans in a volatile environment. This may lead them to not to offer mortgages or only offer short term mortgages which are less affordable for low and middle income people (Lea, 1999).

Additionally, a volatile macroeconomic environment also creates difficulties for the investors. They may prefer short term assets because of the difficulties in forecasting the future inflation and interest rates. They need to forecast cash flows in order to price and calculate the risk of their investments (Lea, 1999).

5.5 General Structure of Housing Finance in Turkey

Turkey, with the passage of the new mortgage law through the Parliament, has made an important move towards a well-functioning housing finance system. However, as stated in the preceding sections, Turkey's problems related with housing are not yet solved. There still exist the unauthorized dwellings, unplanned urbanization and the affordability problems of households. It is hoped that through an effective and efficient housing finance system these problems would be solved and the housing demand of households would be satisfied with qualified and licensed dwellings.

In this section, the general structure of the housing finance systems in Turkey is explained in two subtitles as the non-institutional housing finance systems and the institutional housing finance systems. In non-institutional housing finance systems, financial intermediation is not used and therefore it is an informal way of housing finance. Fund suppliers are usually the relatives or friends of the households added to the households' own equity in non-institutional housing finance systems. On the other hand, institutional housing finance systems are formal methods of housing finance in which funds are transferred to homebuyers as loans by the aid of financial intermediation.

5.5.1 Non-institutional Housing Finance Systems in Turkey

There are mainly four different ways of housing acquisition methods in Turkey. They can be listed as follows:

- Purchasing from a previous owner or from a real estate agent,
- Purchasing from a builder,
- Self provision,
- Acquiring through a cooperative (Tekeli et al., 1999).

Since a housing finance system providing mortgages to house purchasers with a long repayment period does not exist in Turkey, financing housing acquisitions according to the first two forms stated above rely predominantly on the purchasers' own equity. Although commercial banks grant housing loans in the form of consumer credits, they are with short maturities and they have high nominal interest rates. Therefore, households mainly finance their house purchases with their own equity, by selling other properties, by borrowing from close relatives or by using the money transferred from the family members working abroad (Tekeli et al., 1999).

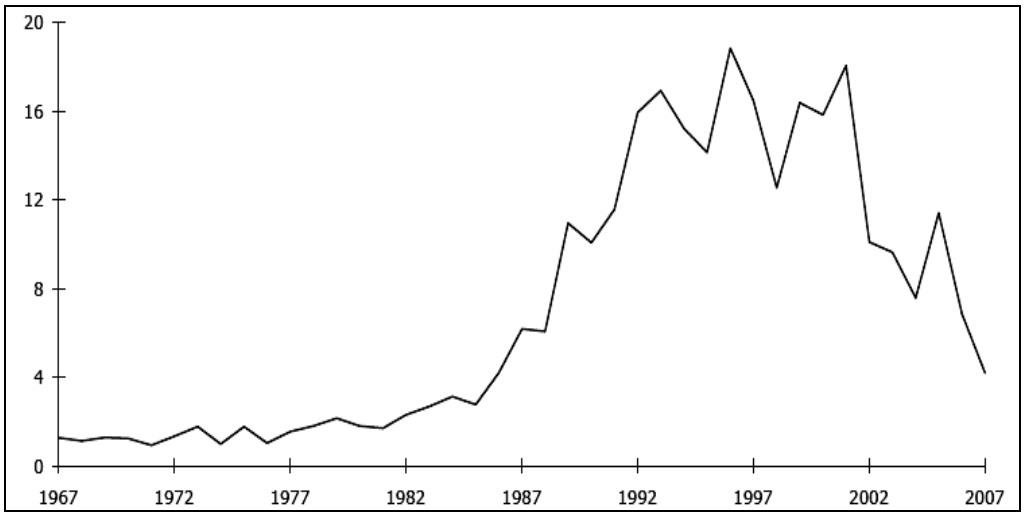
Self-provision ("yap-satçılar" in Turkish) is a form of housing provision in which the owner of a lot undertakes the organization of all the tasks for house building, including preparation of architectural and engineering projects, getting necessary permits for construction, hiring building sub-contractors, and purchasing construction materials etc. Finance has to be provided during the construction period which normally takes about two years. The household relies on his/her own equity and savings for financing the house purchase and the equity creation may continue during the construction period. Some bank credits can also be used in this period (Tekeli et al., 1999).

Furthermore, house building by cooperatives takes much longer than self-provision.

In many cooperatives it lasts more than 10 years to complete the construction of dwelling units from the time of the land purchase. The speed and duration of construction depends on the monthly payment potential of cooperative members as well as on the efficiency of the cooperative management. The former factor can cause a change in the members of the cooperative, where those members who cannot pay the amount decided by the general council of the cooperative sell their shares to more affluent households or are expelled from the cooperative when they fail to pay the specified amounts on time. Households are required to put some equity when they enter the cooperative and in addition to monthly payments that can be paid out of households' savings, some larger interim payments may be required which makes households draw money from their equities. Moreover, cooperative members who are not already homeowners are eligible to get Housing Development Administration (HDA, "TOKİ" in Turkish) credits, provided that dwelling units that are produced by their cooperatives fulfill technical conditions of the HDA credit regulations. Therefore, housing acquisition through cooperatives requires much less equity of households, compared to that of other forms of housing acquisitions (Tekeli et al., 1999).

The following graph shows the number of residential buildings constructed by cooperatives according to occupancy permits. As the graph proves especially after the 1980s cooperatives increased the amount of housing supply in Turkey. However, the economic crisis in 1994 led to a drop in the number of residential buildings build by cooperatives. After the crisis, the sector had reached its before crisis levels in 1998, but the earthquake in 1999 again interrupted the growth. Then, the financial crisis in Turkey in 2001 had a huge negative effect on the amount of residential buildings build by cooperatives. After the crisis, in 2004, the sector saw a growth with the refreshment in the general economy. In 2005, there was a peak in the construction sector. Then, the economic depression in 2006 again affected the sector and the amount of residential buildings build by cooperatives declined. In April 2007, there was a revival in the sector and the growth started again in August

2007 with the removal of the political uncertainty after the elections in the country. Unfortunately, the global economic crisis started in 2008 affected the construction sector again and the sector was weakened one more time in this crisis period.



Source: Turkish Statistical Institute

Figure 5.13 Residential Buildings Build by Cooperatives in Turkey (in thousands)

5.5.2 Institutional Housing Finance Systems in Turkey

Turkey lacks a well-functioning institutional housing finance system in which funds flow from people with fund surpluses to the ones who need them by the aid of financial institutions and improved housing finance techniques in order to produce or purchase dwellings. However, there are some institutions in Turkey that had provided housing loans in the past and some other ones that still provide them. In this section, a brief overview about these institutions is given in order to describe the institutional housing finance system of Turkey.

In 1958, the Ministry of Public Works and Settlement was established by the Central Government in order to support housing finance and to produce housing policies in Turkey. The Ministry mainly gave credits to municipals and to

cooperatives that produced dwellings in places where the construction of unauthorized houses were tried to be impeded. However, the Ministry couldn't continue its services because of the budget deficits. Accordingly, in 1984, the Housing Development Administration of Turkey (HDA, "TOKİ" in Turkish), which is one of the main institutions in Turkey that provides housing loans, was established in order to supply funds for housing finance (Gürbüz, 2002).

In addition, the long-time leading player of the industry was a state-owned bank run by state officials called as the Emlak Bank. This bank ceased its operations in year 2001 (Karakaş and Özsan, 2005).

Furthermore, there were some social security institutions in Turkey called as the Social Security Organization ("SSK" in Turkish), the Armed Forces Pension Fund ("OYAK" in Turkish), and the Social Security Organization for the Artisans and the Self-Employed ("BAĞ-KUR" in Turkish) that provided housing loans to their members mainly through cooperatives, even though their main job description did not contain extending surplus funds as credits to their members for housing production or housing purchase (Gürbüz, 2002). These institutions provided housing loans mainly before the 1980s. They were all established by separate laws and each law included provisions for these institutions to grant housing loans.

Another group of institutions which provides funds for housing finance in Turkey are commercial banks. Commercial banks first took place in this institutional framework in 1989, and they are still one of the main providers of housing loans in the country.

In the following subtitles, the role of the Housing Development Administration**,** Emlak Bank, Social Security Organization, Armed Forces Pension Fund, Social Security Organization for the Artisans and the Self-Employed and commercial banks in the housing finance system of Turkey is explained separately.

5.5.2.1 Housing Development Administration of Turkey

Since its creation in 1984, the single most important source of funds for residential housing finance in Turkey has been the Housing Development Administration (HDA). From 1984 through 1990, the HDA funded 258,588 housing loans through three commercial bank originators which are Emlak Bank, Vakıfbank and Pamukbank. The HDA loans are heavily subsidized and represent loan to value ratios of only 20 percent. The loans are funded through tax revenues and reflect a zero cost of capital to the HDA. While a significant number, these loans did not come close to meeting the housing financing needs of Turkey (Fannie Mae, 1992).

In the 1980s, related with the negative situation in the economy, a recession had started in the housing sector of Turkey. On January 24, 1980 an economic stabilization program aimed at liberalizing the economy by reducing the role of the government was put into practice. As a consequence of this program, interest rates given by banks and bankers (private money dealers) on deposits increased over the inflation rate. During years 1980 through 1982, the demand for real estate decreased very sharply, because the savings were rather deposited in banks and bankers with a higher return. In addition to this, real wages had decreased with the implementation of the economic stabilization program. Consequently, the demand for real estate has declined and this led to a decrease in house prices. Therefore, the housing sector went into a financial crisis in the 1980s (Aydın, 2006).

Accordingly, in order to satisfy the housing demand in the country, Turkish government decided to transfer 5 percent of the national budget each year to the Ministry of Public Works and Settlement. However, this ratio had declined to 1.1 percent in 1982 and to 0.7 percent in 1983 (Gürbüz, 2002).

In 1984, government found a different solution to the problem called as the off-budget programs which were entirely the opposite of the former on-budget

programs. Thus, the Housing Development Fund (HDF) was set up in 1984 in order to deal with the housing shortage in the country (Akçay, 2003).

Between years 1984 and 1988, funds had been created for HDF from special taxes such as the 28.6 percent tax on tobacco and alcoholic beverages, 27.4 percent tax on oil products, 26 percent tax on imported goods such as tobacco, alcoholic beverages or luxury goods. Moreover, 100 US dollars were paid by each person who travels outside the country in order to create funds for HDF (Gürbüz, 2002).

HDA was established in March 17, 1984 with the law numbered 2985 and managed the HDF. HDF was accumulated in the Emlak Bank by the management of HDA and the fund was used off-budget until 1993. The off-budget usage of the fund increased the efficiency and the quality of the housing production between 1984 and 1993. When the fund was taken back into the budget again in 1993, the number of houses financed by HDA had decreased. Between 1984 and 1993, 877,984 dwellings were financed with the fund whereas this number had decreased to 252,117 dwellings between 1993 and 1999 (Gürbüz, 2002).

HDA has been acting both as a housing finance institution and as a real estate developer. It provides loans to cooperatives, to private companies, to municipalities, or to social security institutions for housing construction. On the other hand, real estate development activities of HDA include the assembly of large tracts of land purchased from public or private owners and the preparation of plans along with the provision of the infrastructure (Akçay, 2003).

The loans given by HDA had low and fixed rate interest payments. By May 1989, the housing loans given by this institution had 10 to 20 years maturity and the interest rates were subsidized rates which were lower than the market rates in those days. The loans were mostly granted to cooperatives and to building constructors. Due to the low interest rates, the demand for these loans had shown an increasing

trend. At the same time, inflation had also increased. Accordingly these factors made HDA unable to satisfy the loan demands with the available funds. In order to protect the real value of the fund and in order to maintain the affordability of the loan to the household in an inflationary environment, HDA started to use a new system called as the dual-indexed mortgage system in 1989. At the beginning, the nominal balance of the loan was indexed to inflation and the loan payments were indexed to wage rates in the country. But then, in order to support the repayment of the loan by the household, the system was changed to a single indexation. Wage rates was used as an index due to the rationale that the wage rate increases will move at the same level with the inflation increases in the long-run (Alp, 2000).

The housing finance system applied by the HDA after the 1980s was relatively successful especially with its credits granted to cooperatives and with its housing loans granted by the aid of the banks, but still this system was not a well-functioning housing finance system, because the loans given had both short maturities and small loan to value ratios (Alp, 2000). Moreover, after the transfer of all incomes and revenues of HDA to the national budget in 1993, this institution was precluded from functioning as a housing finance institution. Additionally, in 2001 HDF was totally abolished. As a result, HDA has become totally dependent to its own resources. With the government's Emergency Action Plan in 2001 HDA's function in housing was revitalized. Currently HDA creates resource with revenue sharing projects and produces social housing for low income groups (Aydın, 2006).

According to the current operating summary of HDA, this institution has created 359,677 dwellings between 2003 and 2009 and this equals to 15 cities with a population higher than 100,000. From its establishment in 1984 till 2003, HDA had supported the production of 940,000 dwellings with the housing loans granted by the institution. Currently, they can grant credits to the construction of dwellings with at most 150 square meters in area. The maturity of the loan is 10 years for 100 square meter houses and it is 5 years for dwellings larger than 100 square meters.

Loan payments are indexed to civil service employees wage increase rate for houses up to 100 square meters and they are indexed to civil service employees wage increase rate plus 10 percent for houses larger than 100 square meters.

5.5.2.2 Emlak Bank

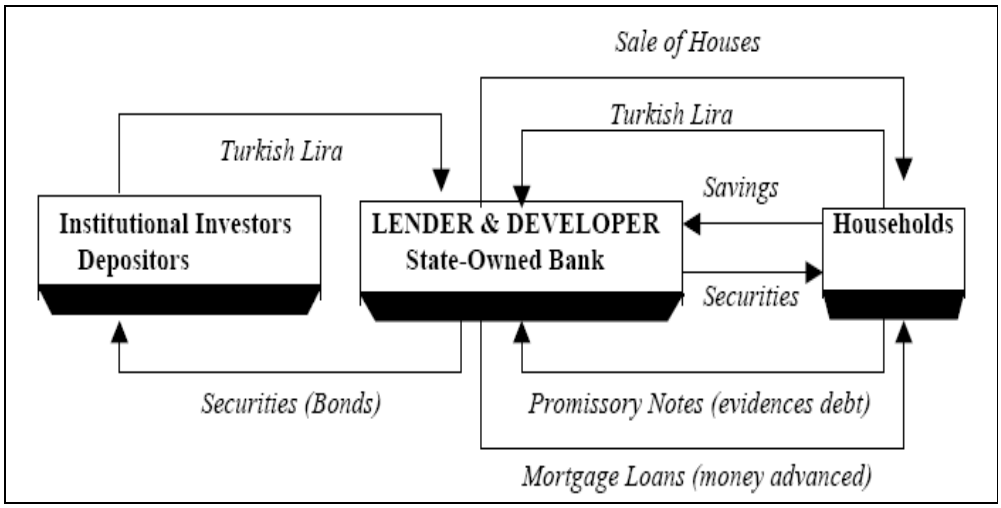
Emlak Bank was a state owned bank which was established in 1926 with the name of "Emlak ve Eytam Bankası". In 1946 its capital was increased and its name was changed as "Türkiye Emlak Kredi Bankası" (Gürbüz, 2002).

This bank is the government housing loan bank. It was created in 1930s to serve this purpose and its name means real estate. The bank has three main functions as the real estate management and construction, retail banking and housing finance (Fannie Mae, 1992).

In other words, the duties of the bank were to provide housing loans, to produce and sell houses, to construct low cost dwellings for the people without houses, to provide bonds, to encourage the building and trade of material industry. Besides, the bank was authorized to take deposits and provide commercial loans in addition to housing loans (Aydın, 2006).

Emlak Bank has played a crucial role in the Turkish housing finance system since the 1950s. It was a leading housing credit lender in the country with large investments and interests in expanding its housing credit products. It deploys the traditional housing credit lending system in which the institution performs the major functions of loan origination, servicing, funding, and portfolio risk management. The bank does not utilize services of third party vendors such as mortgage insurers, real estate appraisers, and accomplishes all the primary functions of housing loan lending (Erol and Patel, 2005).

As stated above, in addition to housing finance, the bank has two other functions as the residential construction and the retail banking. The Turkish Banking Act conditions that only Emlak Bank has the legal authority to participate in joint venture of residential constructions. Being involved in residential construction sector directly, it operates as a lender/developer institution in the market. It also raises funds from the sale of its own built houses. Its wholesale business is on the fund raising side only where funds are obtained primarily from institutional sources through the capital market rather than the directly from the public sector (Erol and Patel, 2005). Figure 5.14 below summarizes the operations of Emlak Bank.



Source: Erol and Patel, 2005

Figure 5.14 Emlak Bank's Operations

Considering the structure of the housing loans granted by Emlak Bank, Fannie Mae (1992) states that they were fully amortizing with a maximum loan to value ratio of 80 percent and with maturity of one to five years. The loans could have been used for primary and secondary residences and payments were due whatever the day of the month the loan was originated. Besides, the loans could have been denominated in Turkish Lira or in Deutsche Marks.

Moreover, the bank used a type of contractual system in which the funds were

accumulated in the bank by the deposits of people who wanted to purchase a house. They were primarily giving housing loans to the deposit holders in the bank. The bank granted these deposits plus 1.5 times of the deposits as housing loans.

Between 1962 and 1969, the bank gave housing loans with 20 years maturity and 5 percent interest rates with this contractual system. On the other hand, the credits given from the bank's own funds had 11 years maturity and 7 percent interest rate. Nevertheless, between 1963 and 1980 the bank could have only financed 4 percent of the total private housing investments in Turkey (Gürbüz, 2002).

In 1987, similar to the Brazilian FGTS (described in Chapter 4), contributions of fixed amounts by employers in both the public and private sectors on behalf of employees, called as the assistance for home ownership of employees, had been deposited in the Emlak Bank to be given as housing loans (Aydın, 2006). After this, in 1993, the number of housing loans granted by the bank increased 10 times the number in 1991 (Gürbüz, 2002).

Emlak Bank originated foreign currency, especially Deutsche Mark, denominated housing loans in the early 1990s. However, the bank was severely affected by the 1994 financial crisis when the Turkish Lira collapsed against the Deutsche Mark. With mounting housing credit defaults, the bank was forced to virtually freeze its lending activity by 1995. In, 1998 Emlak Bank launched the new wage-indexed payment mortgage, specially designed for the high inflationary environments. This had 10 year maturity with an initial maximum loan to value ratio of 75 percent. The housing loan payments were indexed to civil service employee wage rates in order to maintain the affordability of the housing loan for the households (Erol and Patel, 2005).

Finally, due to the financial crisis in Turkey in February 2001, Emlak Bank's assets and liabilities were taken over by another state-owned bank in Turkey called Ziraat

Bank with the approval of the Turkish Banking Regulation and Supervision Agency. Then, some of the bank's funds were transferred to Halk Bank which was also a state-owned bank in Turkey. Moreover, dwellings constructed by the bank and the employee home-ownership assistance funds were transferred to HDA. Consequently, Emlak Bank completely ceased its operations in July 3, 2001 with the judgment numbered 4684.

5.5.2.3 Social Security Organization

Among the social security institutions, the Social Security Organization had granted the highest amount of housing loans in Turkey. The total amount of dwellings financed with this organization had exceeded 229,850 dwellings in total (Alp, 2000).

In 1949s, the Social Security Organization had the choice to grant 20 percent of its funds created by the premiums collected from its members as housing loans again to its members. For dwellings smaller than 85 square meters housing credits with 20 years maturity and for dwellings between 85 and 100 square meters housing credits with 15 years maturity was granted with 5 percent interest rates. This organization provided credits both to its members and to cooperatives (Gürbüz, 2002).

Between 1963 and 1980, this institution had financed 10 percent of the total private housing investment in Turkey. In 1984, after the establishment of HDA, the Social Security Organization was prohibited from giving housing loans (Teker, 2000).

This organization had granted 233,000 highly subsidized housing loans between 1963 and 1984. It was argued that the housing loans with long maturities and low interest rates granted by this institution were the reason why this organization had faced serious financial problems (Teker, 2000).

5.5.2.4 Armed Forces Pension Fund

Armed Forces Pension Fund was established in 1961 and it grants housing loans to it members since 1963. Between 1963 and 1980, Armed Forces Pension Fund had financed approximately 1 percent of the total private housing investment in Turkey. Their housing loans had fixed interest rates between 5 and 7 percent until 1984. Interest rates on their loans were gradually increased to 20 percent by 1990. Maturity of their loans was decreased from 15 years to 10 years in 1983. Between 1963 and 1992, Armed Forces Pension Fund had granted housing loans for 55,000 dwellings in Turkey (Teker, 2000).

Currently, Armed Forces Pension Fund extends individual loans to its members with over 15 years membership with the institution for the purchase or construction of housing, extends construction loans to housing cooperatives whose members are also members of the institution, and gives loans for large-scale residential projects to be constructed on land owned by the Armed Forces Pension Fund. This institution also builds houses on the land it owns and sells them at cost to its members who had the right (www.oyak.com.tr, 2009).

Additionally, in 1996 Armed Forces Pension Fund established the "Supplementary Housing Preaccumulation Fund". All permanent members who have not utilized housing loans or acquired a residence constructed by the institution may participate in this fund. The members joining to the fund pay additional monthly contributions. The contributions accumulate, get yearly interest and at the time of the purchase of a house the lump sum amount in the fund are paid to the member (www.oyak.com.tr, 2009).

Armed Forces Pension Fund still extends housing loans and according to the institution's 2008 annual report, they have extended 4,031 housing loans to its members in terms of personal housing loans, building cooperative loans, and mass

housing production loans in 2008. Their housing loans are available on terms of 36 to 180 months with fixed-installment options. As required by its mission, Armed Forces Pension Fund provides these loans to its members at rates that are substantially below the prevailing market rates on such loans.

5.5.2.5 Social Security Organization for the Artisans and the Self-Employed

The Social Security Organization for the Artisans and the Self-Employed in Turkey supplied housing loans to its premium paying members between 1976 and 1980. In this period, they supplied 2.7 percent of the total private housing investments in Turkey. Due to the high inflation in the country, this institution faced financial difficulties and stopped granting housing loans in 1980 (Teker, 2000).

Regarding the structure of the housing loans extended by this institution, it can be said that their amount couldn't extend 25 percent of the total premiums paid to the institution. Building cooperatives had to have at least 15 members to apply for the loan. In addition, the members should have at least 5 years of membership with the institution and they should have no unpaid debt to the institution. Moreover, the already home-owner members couldn't apply for the loan. The loan to value ratio of the loan was 80 percent for houses up to 100 square meters. The loans had 15 years maturity with 5 percent interest rate (Uludağ, 1997).

5.5.2.6 Commercial Banks

In 1958, commercial banks in Turkey except the Emlak Bank, T.Ogretmenler Bank and Vakif Bank were restricted from extending housing loans with a Cabinet decision until 1979. In 1979, all banks were allowed to grant housing credits. In the period before 1979, T.Ogretmenler Bank and Vakif Bank and after 1979 until 1989,

all other banks were reluctant to give housing loans because it was not profitable to give long-term loans with low interest rates. Emlak Bank was the only commercial bank that granted long-term housing loans in those days. However, starting in 1989 Pamukbank; in 1990 Disbank and Imar Bank; in 1991 Is Bank, Yapi Kredi Bank, Akbank, and Halk Bank started to give housing loans as a type of consumer loans. In those days banks couldn't grant the highly profitable commercial loans and in order to diversify their risk, they started to give housing loans. Additionally, due to the fact that housing loans were fully amortized, banks got the opportunity to have the interest and principal payments at the same time with higher portions of the interest payments coming earlier. Besides, they earned interest rates higher than the ones they paid for the deposits. So, these factors helped the banks to create new funds and therefore they were willing to grant housing loans with high interest rates and short maturities (Alp, 2000).

After 1989, the loans given by the commercial banks had maturities between one to three years with monthly interest rates of 6.75 to 8.75 percent. These rates were always higher than the inflation rates in the country. In those days, only Emlak Bank had loans with lower interest rates and longer maturities. Housing loans granted by commercial banks were not affordable by the low and middle income households. They were mainly targeted at the high-income group of the population (Akçay, 2003).

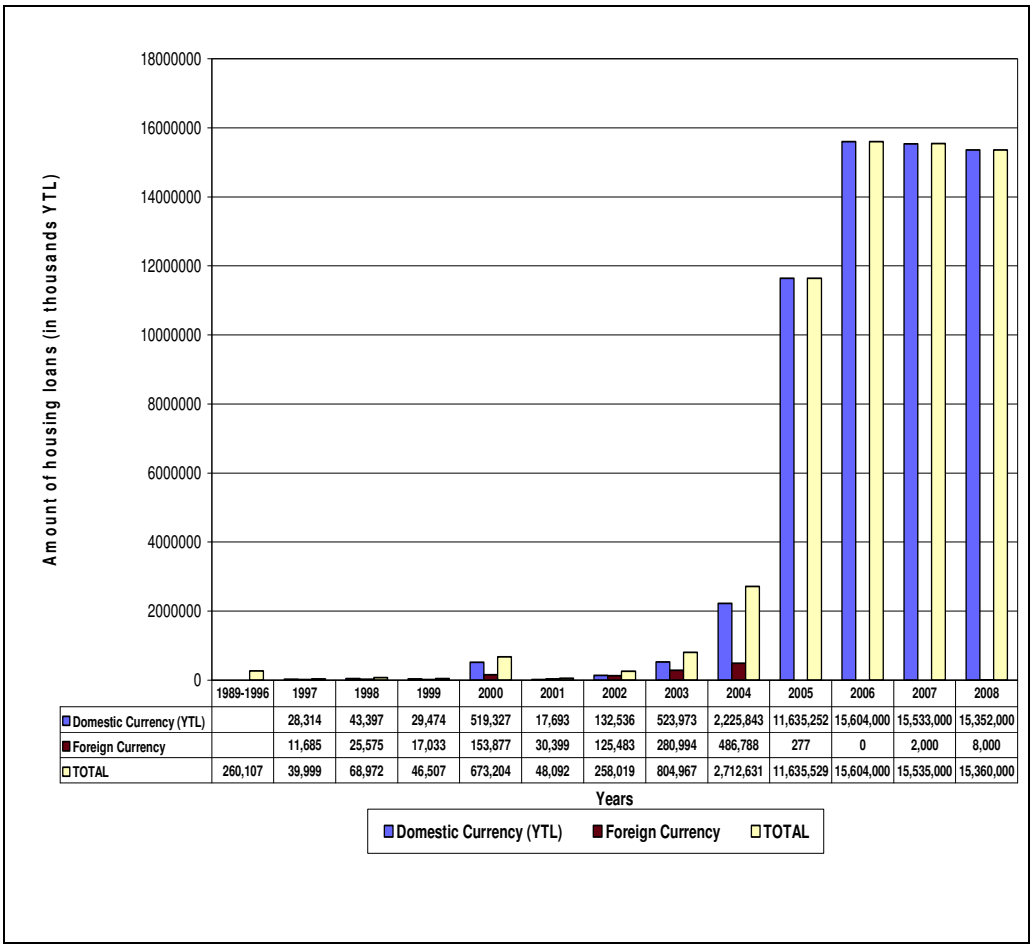
Housing loans granted by commercial banks were mainly foreign exchange credits. They preferred giving foreign exchange credits because the interest rates were high in the country and loan holders couldn't repay their loans in the domestic currency. So, in order to protect themselves from the interest rate risk and the foreign exchange rate risk, banks mainly gave foreign exchange loans. However the foreign exchange crises in Turkey made many borrowers unable to pay their credits back. These problems made it clearer that indexation would create less risky credits for both the borrowers and the lenders (Alp, 2000).

As it can be understood from the explanations above, housing loans given by the commercial banks were not subsidized as the loans given by the HDA or the Emlak Bank. The amount of the general consumer loans granted by the commercial banks was dependent on the general macroeconomic conditions in the country. For instance if there was a stability in the economy and the interest rates were low with the low inflation, then the total amount of loans granted was increased. However, when there was a crisis in the country, maturities of the loans automatically declined and the interest rates increased with the rising inflation.

In Turkey, before the financial crises in November 2000 and February 2001, due to the government policies aimed at reducing the inflation in the country, commercial banks increased the total amount of loans that they grant. They believed that the inflation will decrease and that the government applies a fixed exchange rate regime. In this period before the financial crises, monthly interest rates on domestic currency denominated loans had declined to 2 to 3 percent with maturities increasing to 30 years. But unfortunately, after the crises interest rates had increased and maturities had declined. Moreover, because the government decided to use floating exchange rate regime after the February 2001 crisis, borrowing foreign exchange denominated loans became very risky for the borrowers (Gürbüz, 2002).

The following Figure 5.15 shows the amount of housing loans granted in Turkey between 1989 and 2008. As it can be observed from the figure, the amount of housing loans issued both in the domestic currency and in the foreign currency had decreased in 1999 relative to 1998. The reason for that decline was the negative effect of the 1998 Asian crisis to the Turkish economy. Then, as the graph shows, both the amount of domestic currency and the foreign currency denominated housing loans had increased in 2000 relative to 1999 due to the implementation of anti-inflationary government policies in that period. However, due to the financial crisis in 2001, the amount of housing loans issued had declined relative to 2000. After 2002, the amount of domestic currency denominated housing loans started to

increase, and the relative amount of foreign currency denominated loans had decreased. When the floating exchange rate regime was started to be used in 2001, due to the existence of the foreign exchange rate risk, commercial banks started to grant housing loans in the domestic currency.



	1989-1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Domestic Currency (YTL)		28,314	43,397	29,474	519,327	17,693	132,536	523,973	2,225,843	11,635,252	15,604,000	15,533,000	15,352,000
Foreign Currency		11,685	25,575	17,033	153,877	30,399	125,483	280,994	486,788	277	0	2,000	8,000
TOTAL	260,107	39,999	68,972	46,507	673,204	48,092	258,019	804,967	2,712,631	11,635,529	15,604,000	15,535,000	15,360,000

Source: The Banks Association of Turkey

Figure 5.15 Amount of Housing Loans Granted by Commercial Banks in Turkey

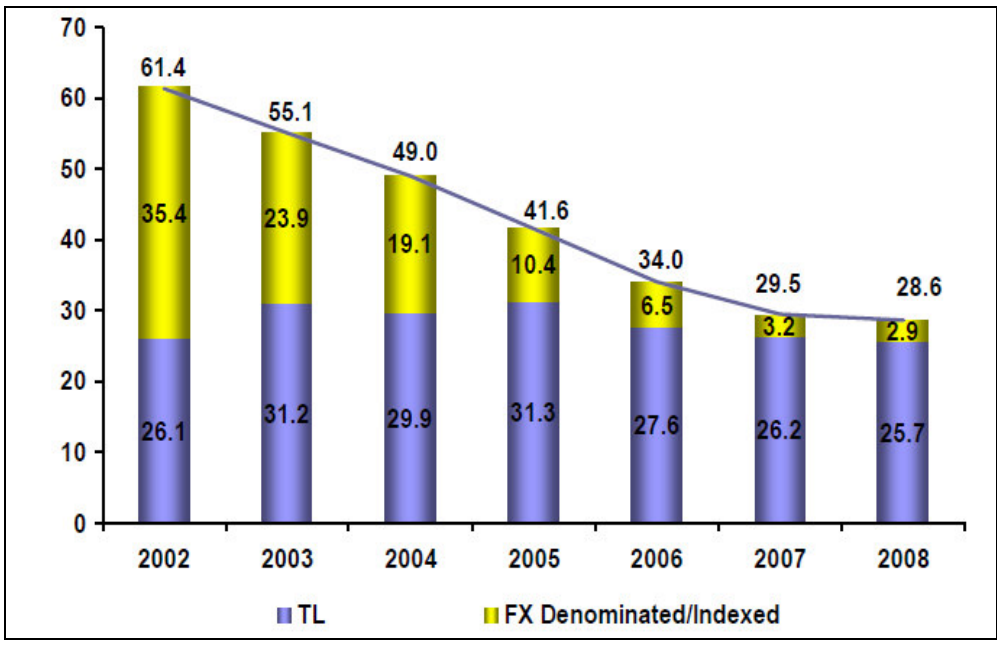
After the crisis in 2001, interest rates had started to decline and the demand for housing loans started to increase in Turkey by the execution of the floating

exchange rate regime. As it was also stated by Karakaş and Özsan (2005), 2003 was a key year for Turkey in terms of the improving macroeconomic environment in the country. As a result of the macroeconomic stability in those days, the general consumer loan portfolio of the Turkish banking industry saw an annual increase of 152 percent. After 2006, again the amount of housing loans issued by commercial banks decreased relative to the previous years. The reason was the same thing again. Changes in the macroeconomic conditions affected the total amount of housing loans issued by the commercial banks. For instance, the decrease in 2008 is related with the negative effect of the sub-prime mortgage crisis in the United States.

So, as it was also stated by Özsan and Karakaş (2005), the total amount of housing loans issued by commercial banks in Turkey has been mainly limited due to the high inflation and high interest rates in the country. But in addition to this, Turkish commercial banks are also faced with the maturity mismatch problem due to the funding of housing loans from their deposits. Therefore, lending of housing loans is also limited because of the lack of a source of liquidity for housing loans.

Furthermore, the high domestic debt requirement of the Turkish Treasury and adversely high interest rates offered by the domestic debt instruments caused a crowding out effect in the secondary bond market of Turkey (Özsan and Karakaş, 2005). Commercial banks preferred investing in short-term Treasury bills rather than granting long-term loans in an inflationary environment.

But as Turhan (2008) explains, in the period after the financial crisis in 2001, the fiscal dominance was eliminated by the aid of sound fiscal discipline and it created room for private borrowing through crowding in. Figure 5.16 below shows the public sector net debt stock as a percentage of GDP in Turkey between 2002 and 2008. As it can be observed form the figure, total public sector debt stock had decreased to 28.6 percent of GDP in 2008 from 61.4 percent of GDP in 2002.



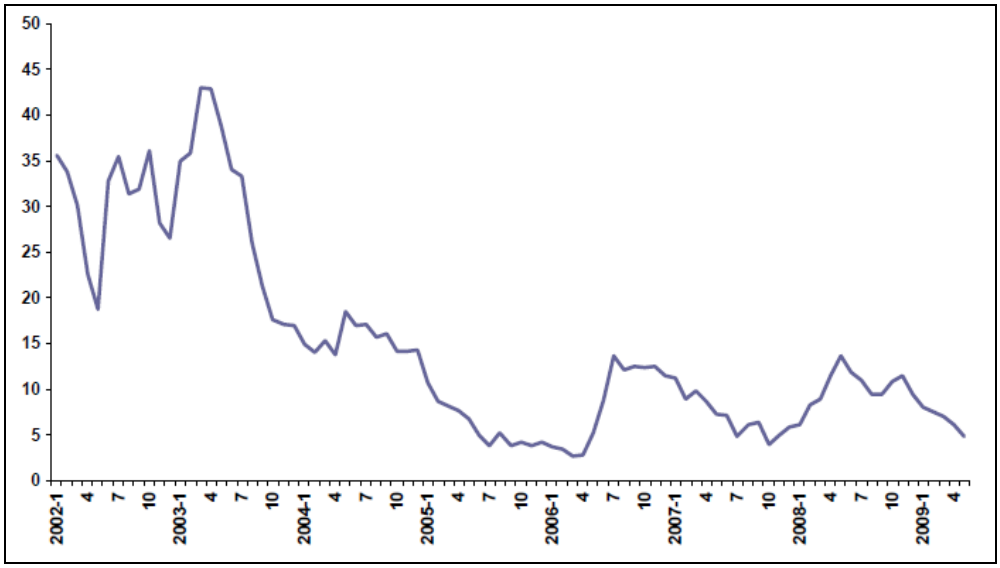
Source: Undersecretariat of Treasury

Figure 5.16 Public Sector Net Debt Stock in Turkey (percentage of GDP)

In addition, Turhan (2008) stated that, with the increasing economic and political stability, and the accession process of Turkey to the European Union, the risk perception of global investors had decreased, and hence Turkish banks got able to borrow from the international credit markets at lower rates.

These factors all had positive effects on housing activity. As it was shown in Figure 5.11 of this chapter, housing loans to the total household loans ratio ranged between 14 to 21 percent from the early 2003 to mid 2005. Then in mid 2006, the ratio of housing loans to total households' loans increased to 50 percent. However, the economic depression in May-June 2006 negatively affected the housing industry. Increasing interest rates decreased the demand for housing loans and the real growth rate of housing loans dropped from 300 percent to 25 percent (Turhan, 2008).

Figure 5.17 below shows the real interest rates in Turkey that is compounded annually between January 2002 and May 2009.



Source: Undersecretariat of Treasury

Figure 5.17 Real Interest Rates in Turkey (in percentages)

As it can be seen from Figure 5.17, real interest rates in Turkey are volatile and this volatility affects the issuance of housing loans negatively in the country.

As of today, commercial banks in Turkey issue housing loans denominated in the domestic currency with maturities varying from 12 to 240 months. Table 5.8 below shows the structure of the domestic currency denominated mortgages supplied by the Turkish commercial banks. As it can be observed from the table, the typical longest length of the housing loan supplied in Turkey is 10 years. This term to maturity is short for low and middle income people, because housing loans are affordable for them when they have longer terms to maturity. Considering the monthly payments, it is again clear that the current housing loans are not affordable by the lower and middle income families. These high interest rates and high payments are only affordable by the high income group of the population.

Commercial banks also supply foreign exchange denominated housing loans in Turkey. For example, monthly interest rates on USD based housing loans with time to maturity of 60 months is 0.90 percent, with 120 months time to maturity is 0.99

Table 5.8 Structure of the Housing Loans Granted by Turkish Commercial Banks

Banks	Monthly interest rate on housing loans with 60 months maturity	Monthly payment on housing loans with 60 months maturity (in TL)	Monthly interest rate on housing loans with 120 months maturity	Monthly payment on housing loans with 120 months maturity (in TL)	Monthly interest rate on housing loans with 240 months maturity	Monthly payment on housing loans with 240 months maturity (in TL)	Housing loans with the longest maturity and its monthly interest rate	Monthly payment on the housing loans with the longest maturity (in TL)
ABank	2.13%	2.968,05	NA	NA	NA	NA	5 years / 2.13%	2.968,05
Akbank	1.34%	2.436,06	1.34%	1.680,12	NA	NA	10 Years / 1.34%	1.680,12
Anadolubank	1.34%	2.436,06	1.39%	1.717,75	NA	NA	15 Years / 1.39%	1.516,38
BankPozitif	1.39%	2.468,08	1.39%	1.717,75	NA	NA	10 Years / 1.39%	1.717,75
Denizbank	1.27%	2.391,61	1.27%	1.628,08	NA	NA	10 Years / 1.27%	1.628,08
Finansbank	1.38%	2.461,66	1.38%	1.710,20	NA	NA	15 Years / 1.38%	1.507,93
Fortis	1.35%	2.442,45	1.35%	1.687,62	NA	NA	10 Years / 1.35%	1.687,62
Garanti	1.39%	2.468,08	1.39%	1.717,75	1.41%	1.460,72	20 Years / 1.41%	1.460,72
Halkbank	1.34%	2.436,06	1.38%	1.710,20	NA	NA	10 Years / 1.38%	1.710,20
HSBC Bank	1.45%	2.506,82	1.45%	1.763,40	NA	NA	10 Years / 1.45%	1.763,40
İsbank	1.38%	2.461,66	1.38%	1.710,20	NA	NA	10 Years/ 1.38%	1.710,20
Kuveyt Turk	1.39%	2.468,08	1.59%	1.871,96	NA	NA	10 Years / 1.59%	1.871,96
Millenium Bank	1.39%	2.468,08	NA	NA	NA	NA	5 Years / 1.39%	2.468,08
ING Bank	1.33%	2.429,68	1.36%	1.695,13	NA	NA	10 Years / 1.36%	1.695,13
Sekerbank	1.39%	2.468,08	1.39%	1.717,75	NA	NA	10 Years/ 1.39%	1.717,75
T.Finans	1.39%	2.468,08	NA	NA	NA	NA	5 Years / 1.39%	2.468,08
TEB	1.32%	2.423,31	1.32%	1.665,17	NA	NA	10 Years/ 1.32%	1.665,17
Tekstilbank	1.39%	2.468,08	NA	NA	NA	NA	5 Years / 1.39%	2.468,08
Vakifbank	1.32%	2.423,31	1.32%	1.665,17	NA	NA	10 Years / 1.32%	1.665,17
Yapi Kredi Bank	1.39%	2.468,08	1.39%	1.717,75	NA	NA	10 Years/ 1.39%	1.717,75
Ziraat Bank	1.34%	2.436,06	1.38%	1.710,20	NA	NA	10 Years / 1.38%	1.710,20

Source: http://www.emlak.gen.tr/konutkredisi.php (as of June 19, 2009)

percent and with 240 months time to maturity is 1.05 percent in Garanti Bank. As Özsan and Karakaş (2005) states, foreign exchange denominated housing loans result in sizable foreign exchange liabilities carried on the balance sheets of the Turkish commercial banks, and also they are not ideal for low and middle income people who may not be financially sophisticated as the higher income level families.

To sum up, the total amount of housing loans extended by commercial banks in Turkey was largely affected by the macroeconomic conditions in the country. They were not subsidized loans and they had high interest rates. Therefore, they were mainly affordable by the high income group of the population. Moreover, it was not possible for the Turkish commercial banks to extend housing loans with long maturities due to their maturity mismatch problem. The deposits that they have collected were with shorter maturities than the needed maturity for the housing loans. So, in order to create a well-functioning mortgage system in Turkey, commercial banks should be supported in terms of fund creation for the housing loans.

5.6 Adaptation of Mortgage System in Turkey

Turkey, being one of the developing countries, that is in need of a well-functioning housing finance system, had made important regulations towards the development of a mortgage system. The new law amending the laws related to housing finance system in Turkey had passed through the Parliament in February 21, 2007. This new law was numbered as 5582 and it was called as the "law amending the laws related to housing finance system". It had come into effect with the publishing in the official gazette numbered 26454 and dated March 6, 2007. However, although the new Law had passed through the Parliament in Turkey, a mortgage system had not yet developed in the country.

The main inhibiting factor for the development of a mortgage system in Turkey is the lack of macroeconomic stability in the country. As it was mentioned several times before, changing macroeconomic environment after the 2001 crisis had positive effects on the total amount of housing loans issued. Especially starting in 2003, inflation and interest rates had declined in Turkey. This shows that, as long as macroeconomic stability is maintained and inflation is kept under control, there is a bright future for the Turkish housing finance system (Turhan, 2008).

Secondly, the structure of the Turkish capital markets is an inhibiting factor for a secondary mortgage market development. Today, Turkey still lacks a long term securities market. Therefore, there are no corporate bonds or asset-backed securities in the country. Treasury bills dominate the market and mortgage-backed securities would have to compete for investors with tax-free, very low-risk Treasury bills. Moreover, financial services industry in Turkey has poor access to capital due to the crowding-out effect of the public sector borrowings with the Treasury bills. Government decreases the liquidity in the market with its Treasury bills and commercial banks have limited access to capital to fund their housing credits (Bergsman, 2006). As a matter of fact, institutions with long term liabilities such as life insurance and private pension companies in Turkey are seeking alternative tools to invest in when they realize the diminishing returns on the government debt instruments (Karakaş and Özsan, 2005). Furthermore, as Özsan and Karakaş (2005) stated, in spite of the adequate laws and regulations for domestic asset backed securitization, due to poor market confidence and crowding-out caused by the Turkish Treasury, commercial banks in Turkey choose off-shore placement practices.

Another inhibiting factor is the maturity mismatch problem of the Turkish commercial banks. Commercial banks in Turkey fund their housing loans through savings deposits. The average term of savings deposits is less than two months whereas mortgages should be long term such as between 15 to 30 years. So in this

situation, for instance mortgages with even 5 to 8 years maturity create an enormous amount of risk load on bank's balance sheets (Özsan and Karakaş, 2005). In other words, as Lea (1994) stated, lenders are faced with significant liquidity risk if they allocate a substantial portion of their assets to long-term housing loans when they have primarily short term liabilities. Additionally, Bergsman's (2006) report states that some commercial banks in Turkey had utilized syndication loans in order to prevent the maturity mismatch problem. As a matter of fact, secondary mortgage markets can create the needed liquidity for the commercial banks.

The main requirement for the development of a successful secondary mortgage market is the existence of a primary mortgage market. Additionally, within that market, the structure of the mortgage instrument itself is very important. It is very important that the mortgages are attractive investments. Interest rates on the mortgages must be market determined and provide investors with a positive, real, and risk-adjusted rate of return. Moreover, the primary mortgage market must be at a sufficient stage of development to produce a significant volume of mortgages to justify the up-front costs of establishing a secondary mortgage market (Lea, 1994).

According to Lea (1994), a second key primary market characteristic is standardization. The author states that, among the many types of mortgages present in the mortgage system only those with sufficient volume are available for sale and securitization. In order to reduce the transaction costs of evaluating mortgages and the processing costs of issuing and administering mortgage backed securities there should be standardization, in other words the characteristics such as the rate, amortization schedule and the term of the mortgages should be uniform. In addition, standardized documentation must be available for all loans.

Considering the housing loans granted by commercial banks in Turkey, it can be said that, although the maturity of the housing loans are similar, monthly interest rates are changing from one bank to another. Bergsman (2006) stated that,

according to the 2004 Fannie Mae report, lack of standardization and specialization are examples of the inhibiting factors for the establishment of a mortgage system in Turkey. Moreover, Karakaş and Özsan (2005) stated that, it is not clear if there are sufficient originations to support sustainable, large scale mortgage market in Turkey. Lenders are limiting their originations only to higher income level people; because they are faced with the maturity mismatch problem and they don't have means to hedge this risk. Lenders do not extend housing loans to low and middle income people who have higher credit or default risks.

Lea (1994) also stated that, along with standardization of the mortgage instrument and design, the underwriting of mortgages should be performed in a comprehensive and consistent manner. The underwriting process establishes guidelines ensuring that a borrower has the ability and the willingness to repay the debt and that the property provides sufficient security for the mortgage.

Bergsman (2006) stated that, according to the 2004 Fannie Mae report, underwriting parameters utilized by each lender vary in Turkey. Lenders use credit scoring systems similar to the ones in the United States, but these systems change from one bank to another. There are two main external sources of credit risk information in Turkey that are the Central Bank of the Republic of Turkey and the Credit Bureau of Turkey. The Central Bank is a provider of bad credit information, whereas the Credit Bureau offers a range of products including good and bad data of the consumer. In addition, most lenders in Turkey use their own internal credit scoring systems. On the other hand, lenders also utilize certain ratios to ensure that a loan applicants' income is sufficient to pay back the housing loan (Özsan and Karakaş, 2005). As it can be understood from this information the credit scoring systems change from one bank to another in Turkey.

Lea (1994) explained that, the appraisal of the property determines the value of the property through examination of the sales prices of similar properties, construction

costs of new properties, market conditions and trends. Considering the appraisal processes in Turkey, it can be seen that currently there are 114 licensed appraisers in the country according to the data obtained from the association of appraisal specialists. According to Özsan and Karakaş (2005), the role of an appraiser is to provide a reliable estimate of the value of the property that serves as the housing loan's collateral. However, the availability of data for the appraisers in Turkey is limited because currently there is no computerized database of real estate sales prices.

Lenders apply loan to value ratios to the appraised value of the real estate property by the appraisers. The normal loan to value ratio in Turkey is 75 percent. Additionally, in order to underwrite a housing loan in Turkey, lenders require borrowers to have a hazard and earthquake insurance for their property. The rate of this insurance is not fixed and it depends on the type of the dwelling and the earthquake zone which it is located in. Besides, most of the lenders require a life insurance to help cover the payment of the loan if the borrower dies (Özsan and Karakaş, 2005).

Lea (1994) also stated that, servicing is very important in terms of the development of a mortgage market. The author stated that, a critical component of a well-functioning secondary mortgage market is the servicing of mortgages. Collection of mortgage payments and periodic transfer of these payments to the investors or to the government supported conduits is the major task of servicers whether they are originators or third parties. In addition, servicers are the primary information accumulators on the mortgages. Thus, they must maintain accurate and up-to-date information on the status and history of mortgages and provide timely reports about these to investors. Moreover, an important part of the servicing job is the establishment of clear guidelines for the collection of mortgage payments. The documents must show payment obligations and procedures to be followed in default.

Özsan and Karakaş (2005) stated that, there are multiple ways that borrowers can repay their housing loans in Turkey. They can pay via a branch, via a direct debit to their bank account, or by other electronic means. In addition, at the time of the closing of the loan, the borrower receives a payment schedule from the lender.

Another important factor in the establishment of a successful housing finance system is the development of a successful legal and regulatory framework. Lea stated that (1994), the primary concern for investors is the level of enforceability of the claim the investor has on the collateral of the loan in the event of a default. This actually depends on the effective title and lien registration system and the ability to enforce foreclosure and repossession over a reasonable time period.

Turkey has well-established property registration and foreclosure laws. Lien records are kept locally at the Title Registry Office responsible from the area in which the property is located. In most cases entries are made by hand. There is little room for human error in these offices, because the transfer of the ownership and recording of the lien is done simultaneously at the title registration offices. Considering the foreclosure law in Turkey, it can be said that, before the passage of the new Mortgage Law, foreclosure law was one of the inhibitors of the establishment of a mortgage system in the country. At that time, foreclosure on properties of defaulted borrowers took as long as four to five years (Özsan and Karakaş, 2005). But with the amendments made with the new law, the delay in these processes was reduced.

Additionally, as Karakaş and Özsan (2005) states, the general reliance on International Financial Reporting Standards provides a sound framework for a secondary mortgage market in Turkey since these accounting standards are common to many countries with well-functioning mortgage markets.

The housing finance system in Turkey depends on several laws, including foreclosure and bankruptcy, consumer protection, capital markets, tax and banking

laws. Each of these laws and regulations had certain aspects that hindered the development of a robust mortgage system in Turkey. These have been redesigned by the new Mortgage Law that had passed through the Parliament (Karakaş and Özsan, 2005).

The new law called the "law amending the laws related to housing finance system" had made several amendments in the Foreclosure and Bankruptcy Law numbered 2004, in the Capital Markets Law numbered 2499, in the Law on Protection of Consumers numbered 4077 and in various tax laws in order to establish a formal housing finance system and provide the necessary framework for the system to be successful.

In the new Mortgage Law, housing finance and housing finance institutions was defined in the Capital Markets Law. According to Article 38/A of the law numbered 2499;

> Housing finance is extension of loans to consumers to acquire houses; leasing of houses to the consumers through financial leasing; and extension of loans to consumers where such loans are secured by the houses that the consumer owns. Loans extended to refinance the loans explained in this context are also included in the housing finance.

Then, housing finance institutions are defined as follows;

> Banks that lend or lease directly to the consumer for the purposes of housing finance and leasing companies and consumer finance companies which are found eligible to operate in housing finance by the Banking Regulation and Supervision Agency.

As it can be understood from the definitions above, borrowers have gained the

ability to borrow mortgages for their existing real estate property with the new law. Moreover, leasing companies are considered to be mortgage lenders with the new definitions. Karakaş and Özsan (2005) stated that since the leasing companies are subject to different set of rules and regulations which provide them with certain benefits, their mortgage lending activity may cause unfair tax advantages against the commercial banks.

Moreover, the details regarding the insurance policies, loan refinancing and the real estate appraisal processes are stated as follows in the new law;

> The Undersecretariat of Treasury is authorized to determine the procedures and principles of the insurance contracts related to the housing finance by taking the opinion of the Association of The Insurance and Reinsurance Companies of Turkey; and Ministry of Industry and Commerce is authorized to determine the procedures and principles regarding the refinance of loans under housing finance by taking the opinion of Bank Association of Turkey. For the loans and leasing receivables which are the basis of the collateral of the mortgage capital market instruments to be issued, The Board is authorized to require that the valuation of houses should have been performed by the authorized real estate appraisal companies and appraisers, during the process of lending or leasing, the process of inclusion of these receivables into the housing finance fund portfolio or into the cover pool of the mortgage covered bonds or the process of revaluation of these assets.

Demirhan and Lale (2006) explained the mortgage finance company, which is an another player in the market with the new the mortgage law, as follows;

> Mortgage finance company is a secondary market institution eligible to buy home loans from housing finance institutions, creates a portfolio, issue covered bonds through securing their home loan portfolio, and securitizes the

> same via housing finance funds as well as extend loans to the housing finance institutions. The mortgage finance companies assure financial resources to housing finance institutions. Their expertise is in acquiring, transferring and managing of receivables accrued from housing finance and securing them to provide resources. Regulation of such institutions aims to establish a secondary market, which will focus on providing resources for the primary market institutions. Mortgage finance companies are subject to the Capital Market Board's jurisdiction and must obtain license to practice from them.

The article numbered 38/A of the Capital Markets Law also defines the housing finance fund that is formed as a special purpose vehicle issuing mortgage-backed securities. Housing finance funds are off-balance sheet funding instruments and they have been introduced for the securitization of receivables arising from the housing finance. The circulation of these funds will create liquidity and therefore maintenance and enlargement of the system. An important character of these funds is the separation of related assets from the founder's property in order to protect them in case of a bankruptcy of the founder (Demirhan and Lale, 2006).

Capital Markets Law defines the mortgage capital market instruments as;

> Mortgage covered bonds, mortgage backed securities, capital market instruments other than stocks that are issued by mortgage finance corporations and other capital market instruments collateralized by the receivables arising from housing finance.

In Article 13/A of the Capital Markets Law, mortgage covered bonds are defined as debt securities which are general obligations of the issuer and secured by assets in the cover pools. Mortgage covered bonds can be issued by banks and mortgage finance corporations. Some important points about the structure of the covered bonds stated in the new law are as follows:

The cover pool may consist of receivables secured by mortgages on authorized houses and authorized other real estate properties, substitute assets and contracts protecting against the risks associated with these. No assets other than these may be included in the cover pool.

Until the mortgage covered bonds are redeemed, the assets in the cover pool cannot be used for any other purposes other than securing the mortgage covered bonds, cannot be pledged, cannot be used as collateral, cannot be distrained including the collection of the public receivables, cannot be subject to precautionary measure decisions of courts and cannot be included into the bankruptcy process.

The contracts made for the purpose of protecting the assets in the cover pool from risks must have a clause that prohibits the counterparty from terminating the contract in the event of bankruptcy of the issuer.

On the other hand, an important amendment made in the Law on Consumer Protection is to allow lenders to extend adjustable rate loans. As Demirhan and Lale (2006) explains, allowing adjustable rate loans will facilitate the risk management of the lenders and by this way they will be more willing to provide longer term mortgages which would automatically decrease the amount of monthly payments for the borrowers and accordingly make the mortgages more affordable for the borrowers. It is also required that the lender must define a cap at the contractual stage and provide the consumer with the maximum amount of the monthly payments he/she will have to pay in case the index rises. The aim here is to make the consumer able to predict the worst case scenario and measure the amount of risk he/she is undertaking.

Another important amendment made in the Law on Consumer Protection is to allow the housing finance institutions to charge a prepayment fee up to 2 percent of the

outstanding loan balance to the consumers in case of the fixed rate mortgage agreements and financial leasing agreements. This prepayment fee has been assessed as a tool to balance the loss and profit of both of the parties. While the consumers can make a profit by ending their current agreements with prepayment, it is eventually a loss for the housing finance institution (Demirhan and Lale, 2006).

Moreover, the issues that have to be included in the loan agreements were stated in the Law as follows (Demirhan and Lale, 2006):

- Loan amount;
- Information about the house;
- Annual interest rate and annual cost rate;
- Total debt amount with interest and other components;
- For the loans with variable rates, calculation method of the changes in the index and interest rates or lease payments;
- Payment plan periodically for the first year and annually for the other years in which the payment dates, the principle, the interest and other costs are shown separately;
- Number of repayments and lease payments;
- Guarantees to be demanded;
- Default interest rate not to exceed the contractual rate plus 30 percent;
- Consequences of the default of the consumer;
- Conditions for early payment of loan amount or lease payments and calculation of pre-payment fee, if any;
- Exchange rate to be applied for calculation of installments and total credit amount, when the credit is extended in foreign currency;
- Name of eligible appraisers and cases requiring valuation; and
- Insurance information regarding the house, if any.

Karakaş and Özsan (2005) stated that the amendments made in the Foreclosure and

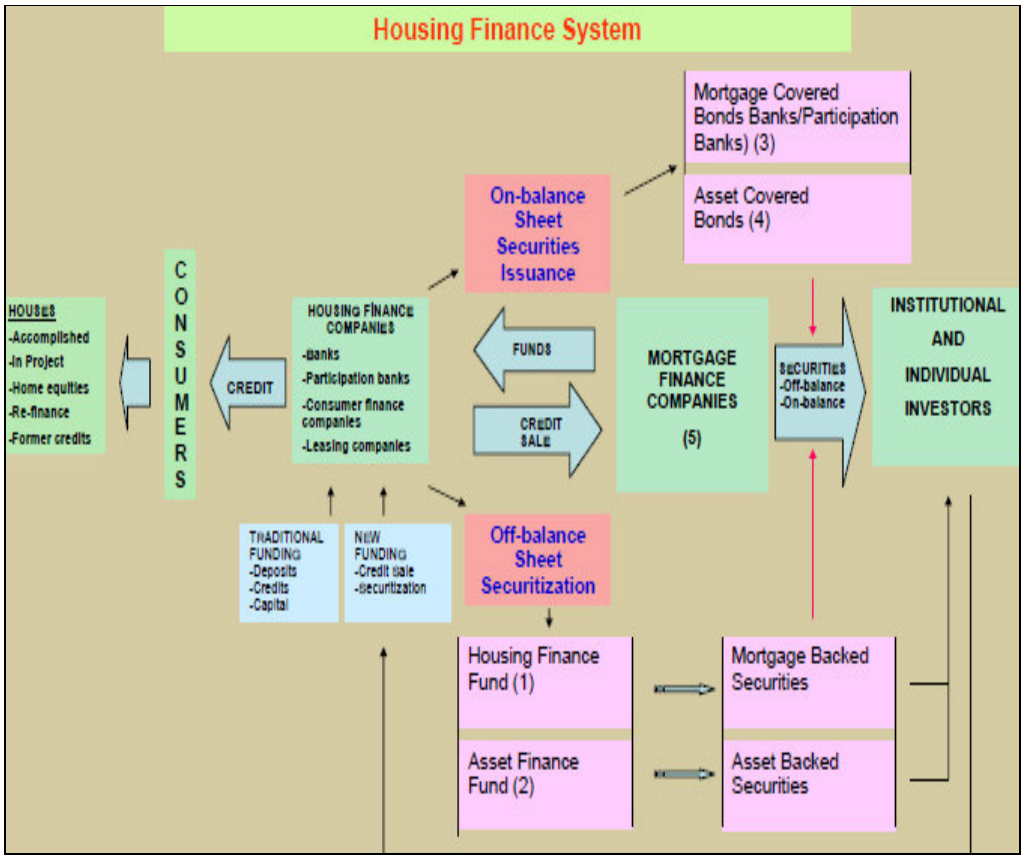
Bankruptcy Law is mainly concerned with reducing the delay in the process caused by delinquent borrowers posting legal objections. In addition to this, the fees associated with making the objections are also increased by the new Law, discouraging borrowers from making objections. Accordingly, if the bank loses the case, all the fees and expenses are to be borne by the bank. However, if the objection is made only for to gain some more time, it will be costly for the delinquent borrower.

Furthermore, the new Law requires the foreclosure officer to ask the individual appraisers or the appraisal companies to assess the real property. In the new Law, it is stated that only licensed appraisers be appointed, but since the number of licensed appraisers is so far very limited, a three year transition period is required for this clause to become effective (Demirhan and Lale, 2006).

By the amendments made in the tax laws, housing loan transactions are exempted from stamp duties and any other type of transaction tax. Although such regulations aim to decrease the overall operational costs during the transfer of funds to house buyers, the income tax exemption has been abolished (Demirhan and Lale, 2006).

To sum up, as Turhan (2008) states, and as it was explained above, the new Mortgage Law will allow mortgages to carry adjustable interest rates and prepayment penalties. It will also facilitate mortgage securitization, thereby allowing risks to be transferred out of the banks to other parties who are willing to take them, and increasing the funding for mortgages. The Law also provides the establishment of mortgage finance companies that can raise non-deposit funds and intermediate the securitization process. Nevertheless, it should also be stated that securitization will take time to develop. Only mortgages with good titles and standard contracts will be attractive for securitizations at reasonable interest rates. Moreover, registration is not fully efficient in Turkey and it is an inhibiting factor for the mortgage system to function well. Thus, the development of mortgage

securitization will depend on the speed with which better titles and standard contracts develop in Turkey. The following figure summarizes the explained above facts by showing the structure of the new mortgage system established by the new Mortgage Law.



Source: Çolak, 2008

Figure 5.18 Mortgage System Established by the New Mortgage Law in Turkey

CHAPTER 6

RELATIONSHIPS OF HOUSING LOANS, INFLATION, AND INTEREST RATES IN TURKEY

6.1 Introduction

As it was stated before in the preceding chapters, macroeconomic stability is one of the most important factors in the development of an efficient housing finance system. High inflation rates and accordingly high interest rates create an instable macroeconomic environment which negatively affects the number of housing loans issued. As it was stated before, developing countries usually suffer from instable economies that are with high inflation and high interest rates. Turkey, being a developing country, also suffered from high inflation and high interest rates and this is one of the main reasons why an efficient mortgage system has not been yet developed in the country.

Sarı et al. (2007) stated the fact that, Turkey had high inflation for more than thirty years, but the country did not run into hyperinflation. The high variability in prices was related with the high volatility in macroeconomic variables. Berument and Malatyalı (1999) found empirical evidence consistent with the Fisher hypothesis indicating that interest rates increase with expected inflation in Turkey. Therefore, as expected inflation increases in the country, interest rates dependent on the expected inflation also increases. Wolswijk (2005) also stated that, due to high inflation higher nominal interest rates are charged on mortgages lowering the mortgage demand as more household income has to be spent on housing finance. Additionally, with high inflation, the responsibility of interest payments and repayments are switched to the initial phase of the loan with negative impacts on the

housing loan demand. High variability in inflation that usually increases with the rise in inflation also has a negative impact on the demand for housing loans.

It should also be stated here that inflation operates through various ways on the demand for housing loans. Wolswijk (2005) stated that to the extent that households' income increases in line with inflation, it may reduce the debt-to-income ratio and thus create room for additional debt take-up. Furthermore, inflation may give rise to additional housing demand from investors that regard real estate as a reasonably inflation-safe hedge. Moreover, the tax advantages of mortgage interest deductibility existent in some countries rises with inflation as tax deductibility applies to nominal interest expenses rather than to real interest expenses. Likewise, Hillebrand and Koray (2008) investigated empirically the relationship between residential mortgages and volatility in mortgage rates for the second quarter of 1971 to third quarter of 2003 in the United States. Contrary to common wisdom, they found a positive relationship between mortgage rate volatility and residential mortgages. Their further investigation indicated that this is due to volatility in the bond market. In times of high interest volatility, households disinvest in government securities and invest in real assets, which yield a positive relationship between mortgage rate volatility and residential mortgages by an increase in demand for real assets, which increases the demand for residential mortgages as well as the mortgage rate.

Apart from the above discussions, Tsatsaronis and Zhu (2004) use a common empirical framework to analyze the main forces that drive aggregate house prices across a number of industrialized countries. After discussing the common features in house price dynamics, they relate the broad differences across countries to distinguishing features of the national markets for housing finance. The most striking result emerging from their analysis is the dominance of inflation in the determination of real house prices despite marked differences in the individual aspects of national markets.

Wolswijk (2005) analyzes the fiscal aspects of mortgage debt in the European Union (EU). His paper describes the main fiscal instruments that governments use to affect mortgage financed home ownership. The fiscal measures used in the paper are the taxation of imputed rent on own houses, the deductibility of mortgage interest payments from income tax, and capital gains taxes on the revenue of selling a house. Moreover, the author acknowledges the fact that most EU governments subsidize owner occupied housing, especially when mortgage financed. The paper also includes an empirical part in which real mortgage debt growth is analyzed for 15 EU countries using pooled regressions. The findings indicate that real mortgage lending growth is positively affected by stock market growth, by house price increases and by financial deregulation measures, while after-tax interest rates exerted a negative effect. Additionally, according to the author's findings real growth of disposable income also positively affected mortgage demand in some versions of the estimates. A negative effect of consumer price inflation on mortgage growth was found in some estimates of the study.

Warnock and Warnock (2008) states that, existing international housing finance studies tend to be descriptive and highly informative, lacking any formal empirical analysis of the depth of housing finance across a broad set of countries. They analyze the determinants of the extent of housing finance in a sample of 62 countries that includes both developed countries and a wide range of developing countries. Across all countries, controlling for country size, they find empirically by regression analysis that, countries with stronger legal rights for borrowers and lenders (through collateral and bankruptcy laws), deeper credit information systems, and more stable macroeconomic environment have deeper housing finance systems. They state that, in the developed and developing country samples, country size is not significant, in other words, larger countries do not (all else equal) have larger housing finance systems. Legal rights is highly significant for developed countries, but less so for developing countries, where it is marginally significant in some specifications and insignificant in others. In contrast, macroeconomic stability and

the strength of credit information systems matter in developing countries but not in developed countries. So, from the findings of these authors it can be concluded that, Turkey, being a developing country, needs macroeconomic stability to establish a mortgage system.

Erbaş and Nothaft (2005) states that, the widespread availability of affordable mortgages can enhance the wealth accumulation, promote savings and financial market development, and stimulate the investment and job creation in the housing sector. International experience suggests that widespread availability of residential mortgages has a favorable impact on the poverty alleviation, quality of housing, infrastructure, and urbanization.

Studies on the housing finance system of Turkey are also mainly descriptive and highly informative, with less formal empirical analysis (see Karakaş and Özsan, 2005; Özsan and Karakaş, 2005; Gürbüz, 2002; Akçay, 2003; Alp, 2000; Alp and Yılmaz, 2000; Aydın, 2006; Uludağ, 1997; Teker, 2000; Demir and Palabıyık, 2005; Berberoğlu and Teker, 2005). Considering empirical analyses on the housing finance system of Turkey, it is argued by Binay and Salman (2008) that the first comprehensive study on real estate markets in Turkey is their study which discusses issues of real estate price bubble, the extent of wealth effects, affordability, financial deepening and credit market risks. Their simulations indicate that given current wealth levels, cost of credit and maturity, average homes are not affordable by average consumers. The market requires further reduction in the cost of credit and extension of maturity to manage a significant demand shift in the real estate market.

Moreover, the study by Akın (2008) looks comprehensively at the housing market characteristics during the 1987-2006 periods in Turkey. On the basis of these characteristics, the paper develops an estimation of quarterly housing wealth series using primary sources on housing stock, residential construction and average floor

area prices obtained from building census, construction and occupancy permit statistics. The author concluded in this study that the estimated downward trend in the housing wealth after 1997 is mainly driven by the decline in the real residential floor area prices as well as the fall in the growth rate of the residential construction with occupancy permits as a consequence of the slump in the housing sector following the financial crises in 1994 and 1998, the earthquake in 1999 and the economic crisis in 2001. Consistent with the general improvement in the macroeconomic outlook after 2003, the housing wealth has started to increase.

Another empirical study was conducted by Erol and Patel (2004) which evaluated the Turkish government's housing policy for financing the public sector housing and examined the desirability of wage-indexed payment mortgage (WIPM) contract from the lenders point of view. The authors stated that from the lender's perspective, the WIPMs are found to be desirable mortgage instruments in periods of persistent high inflation because they eliminate the real interest rate risk and credit risk of the adjustable rate mortgages and the wealth risk of a nominal fixed rate mortgage.

The same authors published another paper in 2005 which analyzed the default risk of WIPMs in Turkey in comparison with other standard mortgage contracts originated in high inflationary economies, and they found that WIPM protects borrowers against risk of high payment shocks whereas nominal contracts such as adjustable rate mortgages would have resulted in high mortgage defaults.

Further, Eryiğit (2008) investigated the housing units, the total amount of housing loans used, the number of people who used housing loans and GDP per capita in Turkey and found empirical evidence that there is a negative linear relationship between the total amount of housing loans used and the housing expenditure index in Turkey by the simple linear regression approach using the yearly data between 1997 and 2005.

Sarı et al. (2007) investigated the relation between housing starts and macroeconomic variables in Turkey from 1961 to 2000. They use the generalized variance decomposition approach to analyze relations between housing market activity and prices, interest rates, output, money stock, and employment. They find that shocks to interest rates, output, and prices have noticeable effects on changes in the Turkish housing market. They further state that monetary aggregate has relatively a more important and substantial effect on housing investment than does employment. Interest rates explain a large part of the forecast error variance in the housing equation.

In this chapter, similar to Sarı et al. (2007), the relation between the total amount of housing loans issued and the two macroeconomic variables that are inflation and interest rates in Turkey is analyzed by a vector autoregression (VAR) analysis with the aim to show that the demand for housing loans is associated with the rise in inflation and interest rates. Sarı et al. (2007) investigated the relation between housing starts and macroeconomic variables in Turkey. In this study, different than Sarı et al. (2007), the relation between housing loans issued and macroeconomic variables in Turkey is analyzed. In other words, this study tries to find the impact of macroeconomic variables on the demand side of the housing market whereas the study by Sarı et al. (2007) found the impact of macroeconomic variables on the supply side of the housing market. It is important to see the causality between housing loans, inflation and interest rates in Turkey, because high inflation rates and accompanied high nominal interest rates affects both the availability of funds for housing loans and the cost of the loan for the borrower, and a well-functioning housing finance system cannot be established without the significant issuance of housing loans. Moreover, the level of disposable income is also an important determinant on the demand for housing loans. However, disposable income is not included in the VAR analysis of this study because the analysis is made between 1998 and 2009 considering the availability of housing loans data in Turkey and the inclusion of disposable income reduces the explanatory power of the analysis.

The following section of this chapter describes the data and the empirical methodology used in the analysis. In the third section, empirical results are discussed, and the last section finally concludes the chapter.

6.2 Data and Methodology

This study uses the Turkish consumer price index (CPI) as the measure of inflation in its empirical analysis. In terms of nominal interest rates, percentage changes in interest rates on twelve-month deposits are used. Quarterly data of percentage change in inflation, percentage change in interest rates and the total amount of housing loans issued in Turkey is gathered. The percentage change in consumer price index with respect to the same period of the previous year is obtained from the web site of the Turkish Statistical Institute (TurkStat) (http://www.tuik.gov.tr) to be used as the data for the quarterly inflation rate in Turkey between March 1998 and June 2009. On the other hand, quarterly data of percentage change in interest rates on twelve-month deposits is gathered from the web site of the Central Bank of Turkey (http://www.tcmb.gov.tr) for the period between March 1998 and June 2009. Further, total amount of housing loans used in Turkey was collected from the web site of the Banks Association of Turkey (http://www.tbb.org.tr). The data set of the total amount of housing loans used includes quarterly data from March 1998 till June 2009. All of the above described data can be observed in the Appendix.

In this study a vector autoregressive (VAR) model is used to eliminate the autocorrelation in the time series data and to see the direction of causality between inflation, interest rates and the total amount of housing loans issued. A vector autoregressive (VAR) model is a systems regression model where there is more than one dependent variable. VAR models provide dynamic interaction among variables of interest and they have high predictive power. The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in

the system as a function of the lagged values of all of the endogenous variables in the system.

Before conducting a VAR analysis, unit root and stationarity tests are conducted to see if the data used in the model is stationary over time. It is widely recognized that many time series data of economic variables appear to contain a unit root(s) in their autoregressive representations. A spurious regression problem is faced among time series data which include a unit root(s). In order to eliminate this problem, differences of the series can be taken. However, the purpose of VAR estimation is purely to examine the relationships between the variables and differencing will throw information on any long-run relationships between the series away. So in this situation in which the goal is not either detecting the presence (absence) of unit roots or their location (i.e., co-integrating relations that are usually interpreted as long-run equilibrium relations), but testing some economic hypotheses that can be expressed with a VAR model, the lag-augmented VAR (LA-VAR) approach proposed by Toda and Yamamoto (1995) is applicable (Yamada and Toda, 1998; Brooks, 2008).

The method designed by Toda and Yamamoto (1995) is robust to integration/co-integration properties of the time series data, and therefore it can be applied without differencing the time series data in the presence of unit roots. According to the Toda and Yamamoto (1995) method, if the lag length of the VAR model is k and if the maximum integration is d_{max}, than the VAR model is estimated with order $(k+d_{max})$. For instance, Toda and Yamamoto (1995) propose intentionally to conduct the VAR model by one extra lag (if the maximum order of integration suspected is equal to one), namely to estimate a (k+1)th order VAR model (Yamada and Toda, 1998).

In this study, causality between inflation, interest rates and the total amount of housing loans issued in Turkey, is tested in a Toda and Yamamoto (1995) VAR approach with the following VAR model.

LOG(HL) = C(1,1)*LOG(HL(-1)) + C(1,2)*LOG(HL(-2)) + C(1,3)*INF(-1) + C(1,4)*INF(-2) + C(1,5)*IR(-1) + C(1,6)*IR(-2) + C(1,7)

INF = C(2,1)*LOG(HL(-1)) + C(2,2)*LOG(HL(-2)) + C(2,3)*INF(-1) + C(2,4)*INF(-2) + C(2,5)*IR(-1) + C(2,6)*IR(-2) + C(2,7)

IR = C(3,1)*LOG(HL(-1)) + C(3,2)*LOG(HL(-2)) + C(3,3)*INF(-1) + C(3,4)*INF(-2) + C(3,5)*IR(-1) + C(3,6)*IR(-2) + C(3,7)

where HL is the short term for the total amount of housing loans issued, INF is the short term for inflation, and IR is the short term for the nominal interest rates. C(1,1), C(1,2), C(1,3), C(1,4), C(1,5), C(1,6), C(1,7), C(2,1), C(2,2), C(2,3), C(2,4), C(2,5), C(2,6), C(2,7), C(3,1), C(3,2), C(3,3), C(3,4), C(3,5), C(3,6) and C(3,7) are the coefficients of the equations. (-1) and (-2) shows the number of lags used.

By design, VAR model focuses on how past changes in one variable affect current values of other variables. The focus in this study is on how shocks to inflation or interest rates affect current and future values of housing loans. The VAR model accomplishes this objective as the impulse responses can be examined allowing for the inherent causality mechanisms that exist among the variables as well as incorporating information contained in the cointegrating relationship (Ewing and Wang, 2005).

Ewing and Wang (2005) stated that, Lutkepohl (1991) criticized conventional impulse responses because results may differ depending on the ordering of the variables. The generalized impulse responses suggested by Pesaran and Shin (1998) solves this problem because it is not sensitive to ordering of the variables and it provides robust results. Accordingly, in this study generalized impulse responses of the VAR model is estimated.

6.3 Results

Before conducting the VAR analysis, first of all, an ADF (Augmented Dickey-

Fuller) test has been conducted to see if the data used in the model is stationary over time. The following Table 6.1 shows the results of the test.

Table 6.1 Results of the Augmented Dickey-Fuller (ADF) Unit Root Test

Name of the Coefficient		**With Intercept**	**With Intercept and Trend**
Housing Loans (log)		-1.286180 (1)	-3.175669 (1)
Critical Values	a= 1% b= 5% c=10%	-3.588509 -2.929734 -2.603064	-4.180911 -3.515523 -3.188259
Inflation		-1.596484 (5)	-1.293619 (5)
Critical Values	a= 1% b= 5% c=10%	-3.605593 -2.936942 -2.606857	-4.205004 -3.526609 -3.194611
Interest Rates		-6.024119 (0)	-5.955901 (0)
Critical Values	a= 1% b= 5% c=10%	-3.584743 -2.928142 -2.602225	-4.175640 -3.513075 -3.186854
Housing Loans (log) 1st difference		-4.957762 (0)	-4.896708 (0)
Critical Values	a= 1% b= 5% c=10%	-3.588509 -2.929734 -2.603064	-4.180911 -3.515523 -3.188259
Inflation 1st difference		-2.578742 (4)	-2.785351 (11)
Critical Values	a=1% b=5% c=10%	-3.605593 -2.936942 -2.606857	-4.262735 -3.552973 -3.209642
Inflation 2nd difference		-9.215410 (3)	-9.070325 (3)
Critical Values	a=1% b=5% c=10%	-3.605593 -2.936942 -2.606857	-4.205004 -3.526609 -3.194611

In Table 6.1 above, the value of the test statistic and the relevant critical values are shown. The numbers in parentheses shows the number of lags that the Schwarz's criterion has chosen for each variable. The test statistic of log of housing loans is not more negative than the critical value in the level, so that first difference of the log of housing loans was tested and the relevant test statistic is more negative than the critical value, so log of housing loans is stationary in its first differences. Considering inflation, its test statistic is more negative than the critical value when its second difference is taken, so the variable is stationary in its second differences according to the ADF test. Interest rates do not have unit roots in level, so it doesn't need differencing.

Secondly, Phillips-Perron (PP) unit root test has been conducted and the results of this test are shown below in Table 6.2. According to this test, natural logarithm of housing loans do not have unit root again in its first differences. Inflation is stationary in it first differences with intercept. When trend is also included, inflation is stationary in the 5 percent level. So, here it is concluded that inflation is stationary in its first differences. Considering the interest rates the same result with the ADF test is found that the interest rates do not have unit root in the level.

Brooks (2008) stated that the most important criticism about unit root tests is that their power is low if the process is stationary but with a root close to the non-stationary boundary especially with small sample sizes. For instance, according to the results of the ADF test, the test statistic for the first differences of inflation with intercept at the 10 percent level is almost stationary. So, the root is close to the non-stationary boundary for inflation.

Brooks (2008) stated that one way to solve this problem is to use a stationarity test as well as a unit root test. The joint use of stationarity and unit root tests is known as confirmatory data analysis. One such stationarity test is the Kwiatkowski-Philips-Schmidt-Shin (KPSS) test.

Table 6.2 Results of the Phillips-Perron (PP) Unit Root Test

Name of the Coefficient		**With Intercept**	**With Intercept and Trend**
Housing Loans (log)		-1.182193 (3)	-2.440472 (1)
Critical Values	a= 1% b= 5% c=10%	-3.584743 -2.928142 -2.602225	-4.175640 -3.513075 -3.186854
Inflation		-2.378143 (4)	-2.414471 (3)
Critical Values	a= 1% b= 5% c=10%	-3.584743 -2.928142 -2.602225	-4.175640 -3.513075 -3.186854
Interest Rates		-6.020925 (1)	-5.952404 (1)
Critical Values	a= 1% b= 5% c=10%	-3.584743 -2.928142 -2.602225	-4.175640 -3.513075 -3.186854
Housing Loans (log) 1st difference		-4.735211 (5)	-4.651027 (5)
Critical Values	a= 1% b= 5% c=10%	-3.588509 -2.929734 -2.603064	-4.180911 -3.515523 -3.188259
Inflation 1st difference		-3.693512 (5)	-3.702954 (6)
Critical Values	a= 1% b= 5% c=10%	-3.588509 -2.929734 -2.603064	-4.180911 -3.515523 -3.188259
Inflation 2nd difference		-11.00732 (7)	-11.01288 (7)
Critical Values	a= 1% b= 5% c=10%	-3.592462 -2.931404 -2.603944	-4.186481 -3.518090 -3.189732

In order to compare the results of the ADF and PP tests with the results of the KPSS test, a KPSS stationarity test is also conducted. The result of this test is shown in Table 6.3 below. According to the KPSS test, the test statistic of log of housing

loans do not exceed the critical value in its first differences, so log of housing loans is stationary in its first differences. Inflation is also stationary in its first differences and interest rates are stationary in the level. So, after the KPSS test, it can be confirmed that natural logarithm of housing loans is stationary in its first differences, inflation is stationary in its first differences and interest rates is stationary in the level.

Table 6.3 Results of the Kwiatkowski-Philips-Schmidt-Shin (KPSS) Stationarity Test

Name of the Coefficient		**With Intercept**	**With Intercept and Trend**
Housing Loans (log)		0.789715 (5)	0.094784 (4)
Critical Values	a= 1% b= 5% c=10%	0.739000 0.463000 0.347000	0.216000 0.146000 0.119000
Inflation		0.810094 (5)	0.188550 (4)
Critical Values	a= 1% b= 5% c=10%	0.739000 0.463000 0.347000	0.216000 0.146000 0.119000
Interest Rates		0.056954 (0)	0.055857 (0)
Critical Values	a= 1% b= 5% c=10%	0.739000 0.463000 0.347000	0.216000 0.146000 0.119000
Housing Loans (log) 1st difference		0.062337 (4)	0.059493 (4)
Critical Values	a= 1% b= 5% c=10%	0.739000 0.463000 0.347000	0.216000 0.146000 0.119000
Inflation 1st difference		0.200158 (3)	0.068672 (5)
Critical Values	a= 1% b= 5% c=10%	0.739000 0.463000 0.347000	0.216000 0.146000 0.119000

After the unit root tests, the appropriate lag length for the VAR model was determined with the information criteria method. The lag length criterion was estimated in Eviews and the Schwarz criteria selected the first lag order as the optimal one. Figure 6.1 below shows the VAR lag order selection criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-353.5669	NA	80473.48	19.80927	19.94123	19.85533
1	-261.1017	164.3826	781.6825	15.17232	15.70016*	15.35655
2	-246.6978	23.20623	586.1150	14.87210	15.79582	15.19450
3	-239.6128	10.23386	671.7107	14.97849	16.29809	15.43907
4	-221.4838	23.16482*	428.3776	14.47132	16.18680	15.07007
5	-208.6855	14.22036	382.4291*	14.26031	16.37167	14.99723
6	-200.3294	7.891894	463.1909	14.29608	16.80332	15.17117
7	-189.3602	8.531611	528.7608	14.18668	17.08980	15.19994
8	-169.6658	12.03547	424.6141	13.59254	16.89154	14.74398
9	-154.4961	6.742063	548.8427	13.24979	16.94466	14.53940
10	-120.7158	9.383414	394.8747	11.87310*	15.96386	13.30089*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Figure 6.1 VAR Lag Order Selection Criteria

As it was stated before, according to the Toda and Yamamoto (1995) approach, if the lag length of the VAR model is k and if the maximum integration is $d_{max,}$ than the VAR model is estimated with order ($k+d_{max}$). In this study k is 1 and the maximum integration is also 1 which is the $d_{max,}$ so that the VAR analysis with Toda and Yamamoto (1995) approach is conducted with 1+1=2 lags.

The result of the VAR analysis is shown below in Table 6.4. The VAR model was formed by three endogenous variables as the natural logarithm of the total amount of housing loans issued [(LOG (HL)], the percentage change in inflation (INF) and the percentage change in interest rates (IR). The only exogenous variable was the

constant C. The VAR model had two lags. Each column in the table corresponds to an equation in the VAR. For each right-hand side variable, Eviews reports the estimated coefficient, its standard error, and the t-statistic. According to the results of the VAR analysis, when the coefficients are substituted in the equations, the VAR model becomes as follows:

LOG(HL) = 0.489363*LOG(HL(-1)) + 0.415126*LOG(HL(-2)) + 0.030777*INF(-1)+ 0.035624*INF(-2) - 0.031270*IR(-1) - 0.020907*IR(-2) + 1.489709

INF = - 2.080576*LOG(HL(-1)) + 0.245471*LOG(HL(-2)) + 1.165053*INF(-1) – 0.368091*INF(-2) + 0.133781*IR(-1) + 0.021859*IR(-2) + 28.84326

IR = 15.04327*LOG(HL(-1)) - 10.32961*LOG(HL(-2)) - 0.487242*INF(-1) + 0.801250*INF(-2) + 0.329069*IR(-1) + 0.558159*IR(-2) - 72.90966

According to the results of the VAR analysis, the response of the total amount of housing loans issued to the percentage change in inflation is positive at the first lag, but the response is not statistically significant. On the other hand, the response of the total amount of housing loans issued to the percentage change in nominal interest rates is negative at the first lag and the response is statistically significant. Further, the response of the total amount of housing loans issued to the total amount of housing loans issued is positive at the first lag and the response is statistically significant.

On the other hand, the response of the percentage change in inflation to the total amount of housing loans issued is negative, but the response is not statistically significant at the first lag and the response of percentage change in inflation to the percentage change in interest rates is positive and the response is statistically significant at the first lag. Considering the response of the percentage change in interest rates to the total amount of housing loans issued, it can be seen that it is positive and it is statistically significant at the first lag. Additionally, the response of percentage change in interest rates to the percentage change in inflation is negative, but it is not statistically significant at the first lag.

Table 6.4 Vector Autoregression (VAR) Estimates

	Total Amount of Housing Loans Issued [LOG(HL)]	Percentage Change in Inflation (INF)	Percentage Change in Interest Rates (IR)
Total Amount of Housing Loans Issued [LOG(HL(-1))]	0.489363 (0.20926) [2.33854]	-2.080576 (1.77973) [-1.16904]	15.04327 (6.04238) [2.48963]
Total Amount of Housing Loans Issued [LOG(HL(-2))]	0.415126 (0.22687) [1.82978]	0.245471 (1.92953) [0.12722]	-10.32961 (6.55094) [-1.57681]
Percentage Change in Inflation [INF(-1)]	0.030777 (0.01651) [1.86363]	1.165053 (0.14045) [8.29494]	-0.487242 (0.47685) [-1.02178]
Percentage Change in Inflation [INF(-2)]	-0.035624 (0.01427) [-2.49659]	-0.368091 (0.12136) [-3.03309]	0.801250 (0.41202) [1.94467]
Percentage Change in Interest Rates [IR(-1)]	-0.031270 (0.00745) [-4.19938]	0.133781 (0.06333) [2.11246]	0.329069 (0.21501) [1.53048]
Percentage Change in Interest Rates [IR(-2)]	-0.020907 (0.00696) [-3.00251]	0.021859 (0.05922) [0.36911]	0.558159 (0.20106) [2.77604]
C	1.489709 (1.25223) [1.18964]	28.84326 (10.6501) [2.70826]	-72.90966 (36.1582) [-2.01641]
R-squared	0.958703	0.973501	0.300187
Adj. R-squared	0.952006	0.969204	0.186704
Sum sq. resids	9.470216	685.0120	7895.942
S.E. equation	0.505917	4.302771	14.60835
F-statistic	143.1587	226.5490	2.645217
Log likelihood	-28.64046	-122.8287	-176.6114
Akaike AIC	1.620021	5.901306	8.345973
Schwarz SC	1.903869	6.185154	8.629822
Mean dependent	12.69724	30.35114	-2.484091
S.D. dependent	2.309337	24.51898	16.19858
Determinant resid covariance (dof adj.)		565.8436	
Determinant resid covariance		336.4678	
Log likelihood		-315.3069	
Akaike information criterion		15.28668	
Schwarz criterion		16.13822	

Further, impulse responses map the responsiveness of the dependent variables in the VAR model to shocks to each of the variables. So, for each variable from each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted (Brooks, 2008). Figure 6.2 below shows the generalized impulse responses for the estimated model. Each response is to an unanticipated increase in a particular variable controlling for (expected) changes in the other variables (Ewing and Wang, 2005).

According to the generalized impulse responses of the VAR model shown in Figure 6.2, an unexpected rise in the total amount of housing loans issued is followed by an increase in the total amount of housing loans up to the second time period, then the total amount of housing loans start to decline starting from the second time period and the effect is persistent as the total amount of housing loans establish a new, lower equilibrium. This decline can be related with the increase in house prices when the demand for housing loans increases. When house prices increase, people would be less motivated to purchase a house and demand a housing credit; therefore the total amount of housing loans issued declines. On the other hand, an unexpected rise in nominal interest rates causes a decline in the total amount of housing loans up to the third period. Starting from the third period, the total amount of housing loans increases a little and reaches the same equilibrium as a response to changes in nominal interest rates.

From the above discussions, it can be concluded that nominal interest rates have an impact on the total amount of housing loans issued in Turkey. There is causality from nominal interest rates to the total amount of housing loans issued and the impact is negative meaning that, the total amount of housing loans decreases when nominal interest rates increase. As it was also stated by Binay and Salman (2008), the real estate market in Turkey requires further reduction in the cost of credit to manage a significant demand shift in the market. Here it is also important to note that, domestic banks in Turkey use the deposit financing route when they grant

housing loans and they are faced with the maturity mismatch problem. The authors stated that, the average maturity of time deposits is three months and housing credits are almost five years in the country. So, banks would be willing to grant housing credits with lower interest rates as long as interest rates on time deposits decrease, because otherwise they would be faced with losses when they earn less on credits than what they pay on deposits. Further, as again stated by Binay and Salman (2008) when nominal interest rates declined significantly in the recovery period after the 2001 financial crisis in Turkey, banks decreased the share of Treasury bills and increased the share of credits in their portfolios. So, when nominal interest rates decrease, availability of funds for lenders increase and lenders would be more motivated to grant credits rather than investing in Treasury bills. In addition, the cost of credit for the borrower also decreases and due to these factors, the total amount of housing loans issued increases.

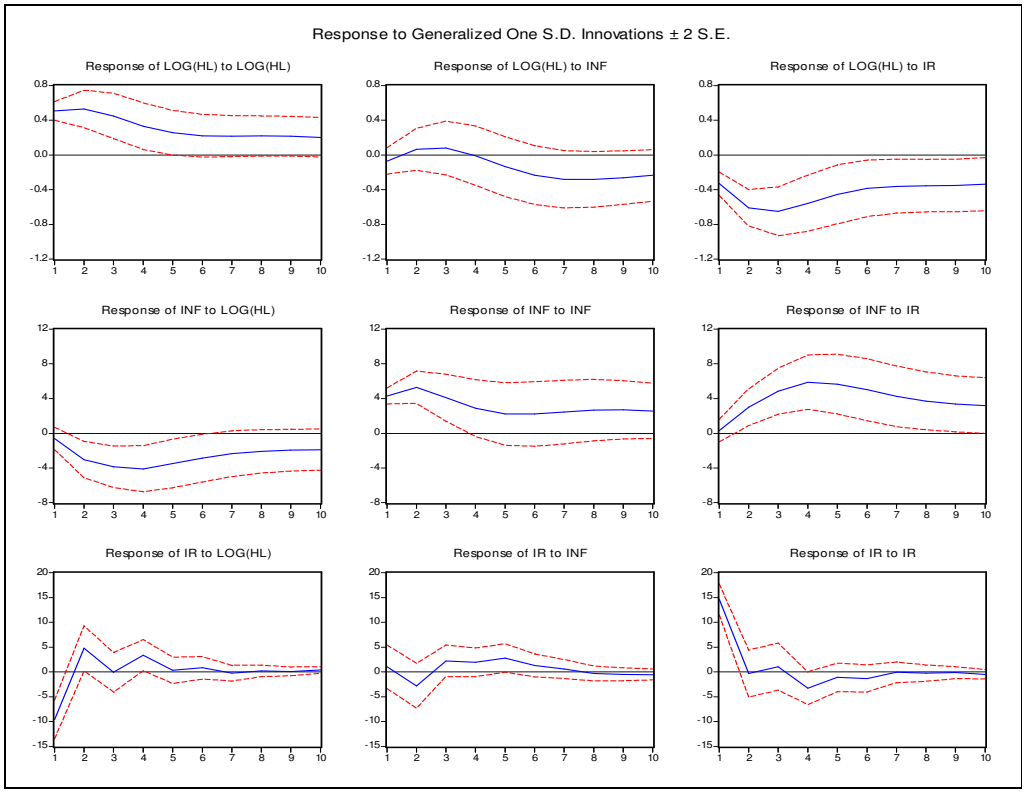


Figure 6.2 Generalized Impulse Responses of the VAR model

According to Figure 6.2 above, the response of the total amount of housing loans issued to inflation, the response of inflation to the total amount of housing loans issued, the response of inflation to inflation, the response of inflation to interest rates, the response of interest rates to the total amount of housing loans issued, the response of interest rates to inflation and the response of interest rates to interest rates is not statistically significant.

After the estimation of the VAR, the stability condition check for the VAR analysis is conducted by looking at the AR (autoregressive) roots table in Eviews that is shown in Figure 6.3 below. As it can be observed from Figure 6.3 no root lies outside the unit circle and VAR satisfies the stability condition.

Root	Modulus
0.916015	0.916015
0.691635	0.691635
0.493929 - 0.466134i	0.679152
0.493929 + 0.466134i	0.679152
-0.587238	0.587238
-0.024783	0.024783

No root lies outside the unit circle.
VAR satisfies the stability condition.

Figure 6.3 VAR Stability Condition Check

Finally, White (1980) residual heteroskedasticity tests for the VAR is conducted with cross terms and with no cross terms including only levels and squares in Eviews and it is found that there is no evidence for the presence of heteroskedasticity, since the probabilities are in excess of 0.05. The results are shown below in Figures 6.4 and 6.5.

Joint test:

Chi-sq	df	Prob.
70.04034	72	0.5434

Individual components:

Dependent	R-squared	F(12,31)	Prob.	Chi-sq(12)	Prob.
res1*res1	0.293638	1.073904	0.4135	12.92007	0.3749
res2*res2	0.139501	0.418800	0.9443	6.138041	0.9090
res3*res3	0.276290	0.986236	0.4829	12.15676	0.4332
res2*res1	0.169936	0.528876	0.8792	7.477178	0.8245
res3*res1	0.299906	1.106650	0.3894	13.19589	0.3550
res3*res2	0.171344	0.534163	0.8755	7.539122	0.8200

Figure 6.4 VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Joint test:

Chi-sq	df	Prob.
171.3399	162	0.2925

Individual components:

Dependent	R-squared	F(27,16)	Prob.	Chi-sq(27)	Prob.
res1*res1	0.760757	1.884355	0.0937	33.47330	0.1819
res2*res2	0.628005	1.000418	0.5149	27.63221	0.4301
res3*res3	0.752625	1.802934	0.1098	33.11551	0.1933
res2*res1	0.503897	0.601904	0.8813	22.17149	0.7286
res3*res1	0.778352	2.080981	0.0641	34.24748	0.1590
res3*res2	0.426820	0.441275	0.9706	18.78007	0.8779

Figure 6.5 VAR Residual Heteroskedasticity Tests: Includes Cross Terms

6.4 Conclusions

The literature about the development and growth of mortgage systems agrees upon the fact that macroeconomic stability is a must in developing countries. High inflation and accordingly high interest rates is an inhibiting factor for the establishment of a deep mortgage market. Unfortunately, developing countries usually suffer from high inflation and accordingly high interest rates and that is one of the reasons why they don't have well-functioning mortgage systems as the developed countries.

Turkey, being a developed country, also suffered from high inflation. Looking at the total number of housing loans used in the country and the general inflation index together, it can be observed that the two variables moves in the opposite direction. In times when inflation declines, the total number of housing loans used increases, and in times when inflation increases the total number of housing loans used decreases. On the other hand, because house prices move in the same direction with the general inflation, as inflation increases house prices also increase and the demand for housing loans decreases. Wolswijk (2005) stated that "high house prices may choke off mortgage demand of starters on the housing ladder, but may spur demand by current owners as it creates room for equity withdrawal where allowed". In this case, we are talking about the first-time buyers, so their demand for housing decreases when house prices increase.

In order to see the direction of causality between total amount of housing loans issued, inflation and interest rates in Turkey a VAR analysis with the Toda-Yamamoto (1995) approach has been conducted and the VAR analysis shows the causality from nominal interest rates to the total amount of housing loans issued. Nominal interest rates have a negative impact on the total amount of housing loans issued, so when nominal interest rates increase the total amount of housing loans issued decreases. However, when nominal interest rates decrease the cost of funds

for the lenders decreases by the decline in deposit rates and also lenders would get more motivated to grant credits rather than investing in Treasury bills. In addition, the cost of credit for the borrower also decreases and due to these factors, the total amount of housing loans issued increases.

Furthermore, according to the generalized impulse responses shown in Figure 6.2, the response of the total amount of housing loans issued to the total amount of housing loans issued is significant and the total amount of housing loans issued declines in the future as a response to an increase in the total amount of housing loans issued in the past. This decline can be related with the increase in house prices when the demand for housing loans increases. When house prices increase, people would be less motivated to purchase a house and demand a housing credit; therefore the total amount of housing loans issued decreases.

CHAPTER 7

CONCLUSION

According to the general rationale of the new Mortgage Law arranged by the Capital Markets Board of Turkey, an efficient housing finance system has significant importance both in terms of meeting the housing needs of individuals and in terms of the development of the construction, finance, and other related sectors of an economy. As a matter of fact, an efficient institutional housing finance system would bring positive social impacts when accordingly the owner occupation rate increases in a country and it would also have positive impacts on the economic development and on planned urbanization of that country.

Considering the main problems of the real estate industry in Turkey, we can see the shanty settlements, poor quality housing production, unplanned urbanization, informality, and high rental costs in the country. More than half of the housing stock in Turkey consists of unauthorized housing. Informality and unplanned urbanization in urban cities became an important problem with the increasing domestic immigration. Many of the houses are unlicensed and approximately 40 percent of them need alteration and repair. Especially, considering the risks that are related with earthquakes, improvement of the unqualified houses is a very important need (SPK, 2007).

On the other hand, looking at the ways that individuals finance their housing in Turkey, it can be seen that only 3.6 percent of the total housing was financed with institutional housing finance methods. It can be observed that most people finance their housing needs by noninstitutional housing finance systems with either their own sources or with borrowing from their relatives or friends. In Turkey, the ratio

of housing loans to gross domestic product (GDP) is 3.6 percent where the same ratio is 4 percent to 12 percent in Latin American countries, 1 percent to 22 percent in Middle Eastern countries, 2 percent to 59 percent in East and South East Asian countries, 85 percent in the United Kingdom (UK), 74.7 percent in the United States (US), and 47 percent on the average in the 25 European Union (EU) countries (SPK, 2007).

Housing finance has been provided in Turkey by the institutional housing finance systems with the housing loans granted by the publicly owned institutions such as the Housing Development Administration (HDA), Emlak Bank, and the social security organizations. However, these institutions were not sufficient for a well-functioning housing finance system in Turkey. They sometimes applied similar policies found in other countries to be more efficient. For example, housing loans granted to the deposit holders of the Emlak Bank under the contractual system was similar to the specialized product, which depended on the savings of the borrowers with the bank for a period of time, offered by the Bausparkassen in Germany. In addition, indexation was used by the HDA and the Emlak Bank similar to that used in the developing, Latin American countries discussed in Chapter 4. Again, Emlak Bank granted housing loans from the contributions of fixed amounts by employers on behalf of their employees, called as the assistance for home ownership of employees, similar to the mortgages granted from the INFONAVIT or FOVISSTE in Mexico and FGTS in Brazil. However, as stated by Aydın (2006), these policies applied by these governmental institutions had failed to be successful in Turkey, mainly because of the lack of sustainability of the policies. Additionally, Aydın (2006) stated that, these institutions were not concentrated on housing finance only. They also had other duties, and they applied these policies besides those other duties. Furthermore, these institutions suffered from unfavorable macroeconomic conditions similar to the other developing countries. In terms of institutional housing finance systems in Turkey, commercial banks were also important that started to grant housing loans in 1989. However, the lack of macroeconomic

stability limited the amount of housing loans issued by commercial banks, either. As it was stated in the preceding paragraph, housing loans to GDP ratio in Turkey was 3.6 percent as of 2007, indicating the low usage of institutional housing finance systems in the country.

The general rationale of the new Mortgage Law stated that, in Turkey, although the maturity of the housing loans issued by commercial banks are up to 20 years, interest rates on these loans are quite high and therefore borrowers are faced with high real interest expenses. In fact, the reason why Turkey has a low housing loans to GDP ratio is that the maturity of the loans are short and the interest payments are high, and because of this reason housing loans are affordable only by the high income level people, and they do not address people with middle or low income level. Indeed, both in Turkey and outside Turkey there are savers who can provide funds that would make long-term and low interest rate housing loans available. All around the world, large amount of savings are transferred to people who want to purchase a house by the aid of capital markets. However, in Turkey, the lack of a housing finance system that would match savers with housing loan borrowers inhibits homebuyers from reaching international funds that are even attainable by the developing countries that have similar economic characteristics with Turkey.

Establishment and development of a mortgage system in Turkey could match savers with borrowers, and it would allow more home buyers to borrow housing credits with more favorable conditions. Besides this main function, mortgage system could help solving the above stated problems in the real estate industry, and would make a contribution in the economic development by the help in the improvement of the financial markets and in the recovery of the construction sector.

With the implementation of a mortgage system, a recovery in the construction and related sectors are expected with the increasing demand for housing. At the same time, mortgage system can help in alleviating informality in these sectors. Houses

would be purchased under the record of the financial institutions, and therefore the construction companies and the contractors at the supply side would be forced to operate in an authorized manner. On the other hand, standardization required by the mortgage system would mitigate shanty settlements and production of unqualified housing. House producers would be forced to produce houses that are suitable with the standards (SPK, 2007).

Capital Markets Board of Turkey, in its rationale for the new Mortgage Law, stated that, establishment of an efficient housing finance system requires consistent amendments in different areas. Basically a housing finance system can be described as mechanisms in which funds are transferred from savers to the home buyers but in order for this mechanism to operate well, many prerequisites have to be satisfied. One of them is macroeconomic stability. Others can be listed as reliable and easily accessible title records, quick placement of a mortgage on a property, correct appraisal of the property, the level of enforceability of the claim the investor has on the collateral of the loan in the event of a default, the existence of capital market institutions and instruments that would help in securitization of the mortgages, the low costs associated with a typical housing transaction such as the stamp duties, resource utilization fund, banking and insurance transactions tax, title fee, and notary expenses. However, even if all of these prerequisites have been satisfied, most of the time a government intervention that would trigger and that would carry the system to a specific point can be required.

As it was stated before in the preceding paragraph, the main prerequisite for an efficient mortgage system is macroeconomic stability. However, it is important here to note that macroeconomic stability is not the fact that macroeconomic variables such as the inflation rate, the unemployment level, and the real interest rate should be in the level of the developed countries. It is important that these variables are in a specific level, but what is more important is being able to protect those levels in a stable manner and to improve them (SPK, 2007).

Inflation has actually been a big problem in Turkey having an impact on the economic and social development of the country. Inflation deteriorates economic structure and financial mechanisms. Regarding the macro level, it inhibits the execution of financial operations needed for basic factors such as income and resource distribution, balance of payments, budget and employment. Inflation can lead to failures in the financial structure of the production companies. Banks also had been facing deteriorations in their financial structures under the impact of the ongoing inflation for years in Turkey. Due to the high inflation, interest rates were high in the country increasing the borrowing costs from the banks. Therefore, it can be observed that inflation can decrease the total amount of bank loans issued. Demand for housing loans, which is one type of a bank loan, is also negatively affected by the inflation. With a decrease in inflation long-term investments would get possible and banks could grant housing loans with longer maturities.

Accordingly, in this thesis, an empirical analysis is conducted to see the causality between the total amount of housing loans issued and the two macroeconomic variables that are inflation and interest rates in Turkey by a vector autoregression (VAR) analysis. It is important to see the causality between housing loans, inflation and interest rates in Turkey, because high inflation rates and accompanied high nominal interest rates affects both the availability of funds for housing loans and the cost of the loan for the borrower, and a well-functioning housing finance system cannot be established without the significant issuance of housing loans. In the end, it is found by the VAR analysis that nominal interest rates have an impact on the total amount of housing loans issued in Turkey. There is causality from nominal interest rates to the total amount of housing loans issued and the impact is negative meaning that, the total amount of housing loans decreases when nominal interest rates increase in the country.

It is also important to note here that domestic banks in Turkey use the deposit financing route when they grant housing loans and they are faced with the maturity

mismatch problem. Binay and Salman (2008) stated that, the average maturity of time deposits is three months and housing credits are almost five years in the country. The problem of interest rate risk arises when lenders grant long-term fixed-rate housing loans. Further, banks would be willing to grant housing credits with lower interest rates as long as interest rates on time deposits decrease, because otherwise they would be faced with losses when they earn less on credits than what they pay on deposits. As again stated by Binay and Salman (2008), when nominal interest rates declined significantly in the recovery period after the 2001 financial crisis in Turkey, banks decreased the share of Treasury bills and increased the share of credits in their portfolios. So, when nominal interest rates decrease, the cost of funds for the lenders decrease and also lenders would be more motivated to grant credits rather than investing in Treasury bills. In addition, the cost of credit for the borrower also decreases and due to these factors, the total amount of housing loans issued increases.

As inflation decreases in Turkey, long-term investments in the Turkish financial markets would get possible and investment in the short-term Treasury bills would decrease. This will happen, because market confidence will be increased as inflation and accordingly interest rates declines. Therefore, the crowding-out effect caused by the Turkish Treasury will be diminished. So, commercial banks' access to capital to fund long-term housing credits would be eased, and accordingly they would get more motivated to give long-term housing credits. As stated by Karakaş and Özsan (2005), institutions with long term liabilities such as life insurance and private pension companies in Turkey are seeking alternative tools to invest in when they realize the diminishing returns on the government debt instruments. So, as inflation declines, the liquidity of commercial banks increases and their maturity mismatch problem would be reduced due to the availability of long-term investments in the financial markets. As a matter of fact, the VAR analysis conducted in this study showed that as nominal interest rates declined, the total amount of housing loans issued in Turkey had increased. The generalized impulse responses of the VAR

model showed that, although it was not significant, the effect of inflation on the total amount of housing loans issued is persistent as the total amount of housing loans issued established a new lower equilibrium as a response to a shock in inflation. So, as it was stated above, as inflation and accordingly nominal interest rates decline, it gets possible for commercial banks to issue housing loans due to the increased availability of funds. There should be sufficient originations in the primary mortgage market to support sustainable large scale secondary mortgage market in Turkey and in order for commercial banks to get able to issue mortgages in the primary mortgage market, inflation and nominal interest rates should decrease so that the availability of long-term funds for commercial banks would increase. Accordingly, it would get possible for commercial banks to create mortgage portfolios, if at the same time, standardization of housing loans, mortgage specialization, and a standardized appraisal system is achieved. After that, as stated by Karakaş and Özsan (2005), if outstanding mortgage portfolios reach a sufficient level of quality and magnitude, then commercial banks in Turkey could issue mortgage bonds as the government's domestic debt requirement is expected to diminish.

Considering all of the benefits of a well-functioning mortgage system, Turkey had made important regulations towards the development of a mortgage system. The new law amending the laws related to housing finance system in Turkey had passed through the Parliament in February 21, 2007. According to the new Mortgage Law, with the establishment of the new housing finance system, capital market instruments that would be supplied by mortgage finance corporations, housing finance institutions and housing finance funds would be alternative investment instruments for the investors and their issuance would support financial markets in expanding and in deepening. Currently in the Turkish capital markets, private sector bonds are not prevalent and the government bonds that are traded in the stock market have maturities that are a bit longer than a year. The lack of a capital market instrument with a longer maturity restricts financial operations with short

maturities, and forming expectations and pricing for longer terms becomes impossible. The maturities of the capital market instruments that will be issued with the establishment of the new housing finance system will be parallel to the maturities of the mortgages issued, and with the development of the system, similar to the examples found in foreign countries, depending on Turkey's economic development the new capital market instruments will have maturities up to 20 or 30 years. The trading of long-term mortgage instruments in the capital markets will make investors understand what will happen in the long-term and will make them measure their risks. The improvement of the market in this way will show its positive impacts in a broad range from the development of the futures market to the supply of the long-term investment instruments that are demanded by the pension funds (SPK, 2007).

IMF (2007) summarized the key elements of the new Law in Turkey as follows:

1) Improvements in the regulatory infrastructure for the primary market (loan origination);

• Legal protection of mortgages is strengthened by introducing new registration requirements and accelerating enforcement and foreclosure procedures.

• Primary market infrastructure is improved by defining the principles of the professional appraisal process.

• Range of available instruments and options is widened by permitting banks to offer adjustable rate mortgages and to charge prepayment fees for fixed rate loans (up to 2 percent of the remaining debt).

• Competition is increased by allowing non-bank lenders to enter the market for mortgage loan origination after a phase-in period.

2) Introduction of secondary market framework (funding and risk management);

• The law introduces Mortgage Finance Corporations (MFCs), which can

provide funding to the primary lenders (loan originators). They may function either as liquidity facilities or as conduits for securitization.

• The law also creates two types of new capital market instruments: mortgage covered bonds and mortgage-backed securities.

- Mortgage-covered bonds allow loan originators to pool their mortgages and fund mortgage lending activity by selling the bonds. The original loans remain on the institutions' balance sheets.

- Mortgage-backed securities enable the institution that originates the loan to move the original loans, and the associated risk, off its balance sheet.

As stated by IMF (2007), the introduction of the adjustable-rate mortgages (ARMs) with the new Mortgage Law in Turkey is a key feature of the Law and banks are likely to advertise ARMs to match their short-term deposits. The future stock of household mortgage debt may thus mainly be in ARMs. While this reduces the lender's interest exposure, it may imply stronger fluctuations in household consumption and in house prices.

Considering the above discussions and mortgage systems of some developed and developing countries reviewed in Chapter 4, it can be said that the mortgage system in the United Kingdom can be a good case to take as an example for Turkey. ARMs are prevalent in the United Kingdom where funding for mortgages is based on short term deposits. The mortgage system in the United Kingdom did not result from specific actions of the government and there has been no general government policy towards the development of the market. The development of the mortgage lending function should be seen as part of the normal banking activity and regulated as such, and there should be no attempt to stipulate which institutions should make mortgages or the type of mortgage instrument. The lessons of the British experience were that, mortgage lending will thrive provided that there are the right macroeconomic, legislative and regulatory conditions, and if mortgage lending is seen as a normal banking function. In fact, after the passage of the new Mortgage

Law in Turkey, the legislative and regulatory conditions are in place and a mortgage system will develop of its own accord in Turkey regardless of the actions of the authorities if inflation and interest rates are low and stable (Boleat, 2004).

Furthermore, as stated above, the predominant mortgage financing system is the use of retail deposits in the United Kingdom. Similarly, in Turkey, the deposit financing route is used. It is an inherent feature of the deposit taking model that the rate of interest charged on mortgages should be variable. Retail deposit taking institutions are not able to raise from their traditional funding source large amounts of money at fixed rates of interest for long time periods. It is vital that a mortgage lender matches assets and liabilities. Retail banks do this by conducting all of their operations on a variable rate basis or use rates of interest that are fixed for relatively short periods, typically up to two years (Boleat, 2004). The savings and loan crisis in the US also made clear the dangers of funding short-term liabilities with long-term assets in markets with volatile interest rates. Depository institutions can hold fixed rate mortgages only when nominal interest rates are low and stable (Green and Wachter, 2005). Because nominal interest rates are high and volatile in Turkey, commercial banks cannot grant fixed rate mortgages.

The alternative method of raising funds is through the wholesale market that is raising money, generally at fixed rates, over longer periods of time from 5 to 25 years and then lending the proceeds, also at a fixed rate of interest, over the same time period. Where funds are raised for, say, 5 years through bonds then mortgages can be made for 25 years with the rate of interest being reviewed every 5 years to bring it into line with the current bond rate. Mortgage lending can be financed by bonds raised in the normal course of banking business with no special conditions. In a number of countries, mortgage bonds or covered bonds are used to finance mortgage lending. Basically, the lending institution raises funds on its own balance sheet backed by a pool of mortgages on its books. Because the bonds are well secured compared with unsecured bonds of the banking system, they attract a lower

rate of interest (Boleat, 2004). The mortgage bond system is most developed in Denmark but it is used in a number of other countries including the United Kingdom and Germany.

As stated by Lea (1994), proposals for secondary mortgage markets frequently focus on mortgage securitization. However, the issuance of securities is premised on the existence of well developed capital markets. A secondary market facility that purchases mortgages from or makes collateralized loans to primary market lenders, funded by covered bonds, is also a form of secondary market. The new Mortgage Law in Turkey created mortgage finance corporations (MFCs) as a secondary market facility which can provide funding to the primary lenders and the Law also created the covered bonds that can be issued by banks or the mortgage finance corporations. For the Turkish case, using covered bonds to raise funds is the most suitable case for now considering the general situation of the financial markets and the economy in the country.

In this respect, Boleat (2004) stated that,

> There can be a temptation in countries seeking to develop mortgage markets to see securitization as an easy way to move to a sophisticated mortgage market. The United States (US) model, with Fannie Mae and Freddie Mac, is sometimes seen as being one to follow. However, countries like Turkey should eliminate securitization from their thinking for the foreseeable future. Securitization has been essential in US because the primary market has been so inefficient as a result of government regulation. Securitization in US has involved the nationalization of the housing finance system and causes significant problems. It should also be understood that securitization can work only if most of the necessary requirements for an efficient primary market are in place and if there is a large critical mass of business which will provide liquidity to the market. On the other hand, deposit taking and issuing bonds

> are normal functions of the banking system and it should be for the banks and the market to decide the balance between the two forms of funding. There is no reason why they cannot co-exist as they do in most countries already.

The general recommendation for Turkey and for the other developing Latin American countries discussed in this study is to do everything possible to get the right macroeconomic conditions in terms of inflation and of interest rates. Because Turkey does not have a secondary mortgage market yet, an advice for Turkey in a secondary mortgage market establishment is to not see securitization as the way of developing a secondary mortgage market. For now, issuing covered bonds that can be purchased by pension funds, insurance companies and other banks is an appropriate way to improve access to long term sources of funds for mortgage lending in Turkey. As stated by Lea (1994), it is more appropriate for securitization to develop naturally, in response to a funding cost differential, capital market development and the demand for off-balance sheet financing.

Considering the recommendations of the other studies about the housing finance system of Turkey, Karakaş and Özsan (2005), similar to this thesis, recommended that, securitization of mortgages locally to local investors like banks, pension companies and insurance companies, through an on-balance sheet securitization is the best solution to the maturity mismatch problem of commercial banks. On the other hand, Berberoğlu and Teker (2005) proposed an appropriate housing finance model after short discussions of housing finance systems applied throughout the world. The housing finance system proposed by the authors accepts all the principles of the new Mortgage Law passed through the Parliament in Turkey. Similar to this thesis, the authors stated that, macroeconomic stability, reliable and easily accessible title records, a professional appraisal mechanism, some tax regulations, quick and standardized foreclosure procedures, and capital market institutions and instruments for securitization are needed in order for this housing finance system to operate well.

This thesis reviews the mortgage systems of some developed and developing countries and then discusses the current situation of the housing finance system in Turkey, and mainly looks at the applicability of a mortgage system in the country. However, mortgage system is a relatively new concept for Turkey. Data is still limited about this topic. For instance there are no readily available house price data for Turkey. Boleat (2004) stated that, the provision of more data on the housing market will help the market work more efficiently. So, it is advised for Turkey that the collection of data on the housing market particularly in respect of property values should be stimulated. Future studies can conduct statistical analyses using this kind of data if the data would get readily available. Again, future studies can investigate the success of the system after its establishment. The actual benefits and costs of the system to the finance and construction sectors of the economy can be explained. The impact on the general economy can be discussed. Furthermore, the access of middle and low income households to institutional housing finance is very hard in Turkey due to large down payment requirements, high interest rates and short maturities of the available housing loans offered by the commercial banks. As stated by Akın (2008), low income families use either rented housing, live in a family-financed housing or in illegal housing where the middle income households are targeted by governmental agencies to a very limited extent. Secondary mortgage markets do not solve the affordability problem of low and middle income households for housing. It is clear that government can solve the housing problems of this group possibly with targeted subsidy programs, but future studies can try to recommend other solutions to this problem when a mortgage system starts to function in Turkey.

To sum up, as stated by IMF (2007), the new Mortgage Law improved the conditions for mortgage lending in Turkey and it introduced new options to fund this lending in the country. While there are still some necessary sub-regulations that are needed to be issued, the new legislation has prepared an adequate legal basis for a well functioning mortgage market. Turkey has adapted best international

experiences taking into account its economic and social environment in terms of establishing a well-functioning housing finance system, but the bright future for the Turkish housing sector can be achieved as long as macroeconomic stability is maintained and inflation is kept under control in the country. Country examples, especially from the developed countries, showed that the introduction of mortgage legislation combined with favorable macroeconomic conditions have led to rapid mortgage market growth. In this respect, it is hoped that, by preparing the adequate legal framework for mortgage lending and by the positive developments seen in the Turkish economy in recent years, a well-functioning mortgage system would be established in the country.

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APPENDIX

TABLE OF THE QUARTERLY DATA FOR THE VAR ANALYSIS

Periods	HL	INF	IR
1998.03	12,723	97.2	0.4
1998.06	15,423	90.6	-4.2
1998.09	20,796	80.4	-1.4
1998.12	20,030	69.7	4.3
1999.03	7,314	63.5	-5
1999.06	9,628	64.3	1.1
1999.09	9,185	64.3	-4
1999.12	20,381	68.8	-46.9
2000.03	103,602	67.9	-20
2000.06	186,217	58.6	-1.4
2000.09	206,569	49	9.1
2000.12	176,816	39	13.4
2001.03	13,695	37.5	70.2
2001.06	7,934	56.1	-21.9
2001.09	9,129	61.8	9.7
2001.12	17,334	68.5	-6.2
2002.03	23,597	65.1	-6.7
2002.06	77,335	42.6	-10.8
2002.09	76,677	37	2.5
2002.12	80,410	29.7	-9.7
2003.03	103,775	29.4	1.5
2003.06	122,046	29.8	-12.6
2003.09	195,782	23	-19.7
2003.12	383,364	18.4	-16.6
2004.03	636,448	11.8	-20.2
2004.06	890,937	8.9	4.6
2004.09	528,625	9	-2
2004.12	656,621	9.3	-5.7
2005.03	1,331,000	8.72	-11.8
2005.06	3,071,000	10.65	4.4
2005.09	4,086,000	11.23	-1.9
2005.12	4,479,000	10.53	2.3
2006.03	5,226,000	10.11	-6.4
2006.06	6,167,000	11.13	14
2006.09	1,733,000	10.5	9.1
2006.12	2,478,000	9.65	0
2007.03	2,446,000	10.86	-3
2007.06	4,122,000	8.6	-2.7
2007.09	4,280,000	7.12	-1.7
2007.12	4,687,000	8.39	-4.5
2008.03	5,338,000	9.14	0.4
2008.06	4,737,000	10.61	7.3
2008.09	3,704,000	11.13	5.3
2008.12	1,581,000	10.06	7.6
2009.03	2,479,000	7.89	-29.2
2009.06	3,972,000	5.73	-4.1