

**ASSET MARKETS AND BUSINESS CYCLES: THE CASE OF THE REAL ESTATE MARKET
IN TURKEY¹**

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Abstract

The significance of the real estate market and its interplay with the business cycle has recently attracted greater attention in the literature. This paper contributes to the literature because, first, it examines the Turkish real estate market – on which few studies exist -, and second, the emphasis is on the macroeconomic linkages to this market.

Turkish real estate markets are characterized by an absence of a widespread mortgage system, high interest rates, high intermediation spreads, and a desire by banks to lend for relatively short terms and/or in foreign currency. A vector autoregression model is employed in order to examine macroeconomic factors that affect real estate markets in Turkey. A finding of this article regarding the importance of innovations in CPI in accounting for a relatively larger share of the variability in home expenditures is consistent with the view of homes as an anti-inflationary hedge and is a reflection of chronic macroeconomic instability in Turkey. The result for wage expenditures indicates that income change is not crucial in determining home prices, or, for the purposes of our study, per capita home expenditures. Recent developments in the housing loan market suggest that a loan boom may have raised housing prices sharply, but the relatively few observations in our data set depicting this phenomenon fail to translate into significant results in a VAR model.

JEL Classification: L85, H5, C51

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¹ Short excerpts, not to exceed a brief paragraph, may be quoted provided full credit is given. Authors have benefited from discussions with Sufian Azem.

Introduction

In the past decade, multilateral financial institutions, such as the International Monetary Fund, have come to focus on factors affecting financial stability across countries. While foreign currency, equity, and money market indicators have long been used to gauge financial stability, the significance of the real estate market and its interplay with the business cycle has recently attracted greater attention in the literature. This belated examination was certainly not due to a lack of recognition of just how important real estate assets are in portfolio compositions, but rather a consequence of a dearth of pertinent data – except for a handful of OECD member countries – and, possibly, the relatively illiquid nature of these markets.

This paper thus contributes to the literature because, first, it examines the Turkish real estate market – on which few studies exist -, and second, the emphasis is on the macroeconomic linkages to this market. It is only a first step in this direction, however, as it suffers from limited data availability.

Different types of real estate, usually classified according to category of use², may have distinct features. While all are affected by some common key factors, the degree of significance of each factor may vary for different types of real estate. Real estate market determinants may also be disaggregated to microeconomic³ and macroeconomic variables, with the focus here being on the latter.

Literature Survey

Collins and Senhadji (2002) cite imperfect information⁴, supply rigidities⁵, imperfect financial markets⁶ as being defining characteristics of real estate markets. These contribute to creating a market vulnerable to prolonged deviation of fundamental value⁷ from actual value, namely an asset price bubble.

Tsatsaronis and Zhu (2004) distinguish between demand and supply factors which are further broken down to short run and long run determinants. The latter are said to include growth in disposable income and demographics on the demand side, and variables like construction costs, land availability on the supply side. Other determinants include the state of the regulatory framework, taxes and interest deductibility of mortgage payments, and real interest rates - cost of borrowing.

² Residential, commercial, industrial, and sub-categories of each, and so on.

³ Microeconomic factors comprise number of units, location, use type, type of construction, age of unit, size, number of rooms, utility and facilities, physical condition, last sales date and value, current market value, tax valuation, vacancy rate, occupant status (owner, tenant), rental information, and building permits.

⁴ “Investors either underestimate or overestimate the fundamental price”.

⁵ In other words, demand factors dominate in the short run, while supply factors adjust in the long term.

⁶ In efficient financial markets, any deviation whereby fundamental price was less than actual price would be countered by short-selling of real estate.

⁷ Replacement value.

Hilbers, Lei, and Zacho (2001) overview several key real estate cycle mechanisms. In the fixed supply and overoptimistic investor model⁸, some investors' payment of above replacement cost price for housing combined with supply inertia, pushes up prices. This is only temporary until supply gradually rises. Eventually, prices fall, and as overoptimistic investors rush to get out of the market, prices fall further. Construction lags and imperfect information have also been used to model real estate market behaviour. When prices rise, construction starts respond by rising as well. By the time these are complete, the demand may not be there, causing price declines. Another model is based on loans collateralized by real estate. Value of collateral rises become self-enhancing - referred to as amplification in the literature- during economic expansion. Thus, when price of housing rises, value of bank owned land - thus capital – and real estate collateral both rise. Perceived risk of housing loans fall, leading to an increase in supply of housing loans, further fuelling housing price rises. When the economy begins to contract the cycle reverses. Under the moral hazard model, under-regulated, over guaranteed lenders provide risky loans which, again, may result in an asset bubble. Finally, financial liberalization experiences have also led to asset price bubbles. In such episodes, as interest rates fall and banks compete with each other to find new growth avenues, housing loans boom and lead to price rises.

Tsatsaronis & Zhu (2004) observe that the most developed OECD member countries have experienced about two full real estate cycles between 1970 and 2003, specifically, in early 1980s and 1990s. Helbling, T. and M. Terrones (2003) examine industrial countries in the post-war period and find that “equity price busts occurred on average once every thirteen years lasting for 2.5 years and were associated with GDP losses of roughly 4% of GDP. Housing price busts were less frequent, but lasted twice as long and output losses were twice as large. To qualify as a bust, housing price contraction had to exceed 14%, compared with 37% for equities”. Hilbers et al (2001) point out, however, that countries such as Finland, Malaysia, Mexico, and Spain have experienced relatively fast boom and bust cycles spanning only a few years. Price declines are usually gradual, lasting three to eight years for their sample of countries.

Krainer (2003) points to two stylized facts of the US housing market. First, changes in house prices apparently display strong persistence due to adjustment inertia in this market⁹. Second, nominal house prices do not usually fall, but merely flatten out. This according to the author suggests that home purchases are both investment and consumption motivated. He also points out that real price declines are more frequent.

⁸ Backward looking expectations would lead to serial correlation in real estate markets. See also Capozza et al (2002).

⁹ Persistence being indicative of imperfect markets.

Real Estate Markets in Turkey

The Turkish experience may, to a large extent, also be described by the various real estate market mechanisms listed above depending on the time span examined. In addition, an important factor affecting the Turkish real estate market in the past decade has been a natural disaster¹⁰, the 1999 Marmara earthquake. Its impact was profound because 37.8% of Turkey's GDP originated in this region¹¹ according to the State Institute of Statistics (SIS).

Chronic financial instability has been a constant feature of the Turkish economy in the past three decades. While demographics is indisputably a significant long term factor affecting real estate markets in Turkey, changes in income have demonstrated sharp swings at short intervals particularly in the past two decades in Turkey. In contrast to the industrialized countries' recent experience of a smooth trade cycle once a decade or so, the Turkish economy contracted in 1973, 1980, 1991, 1994, 1999, and 2001, exhibiting extreme swings in most of these cycles. The Turkish real estate market has also exhibited extreme volatility, although the trough reached in 1999, for instance, did not have at its root economic factors, but a devastating earthquake¹² as mentioned earlier.

The Turkish real estate markets are characterized by an absence of a widespread mortgage system, high interest rates, high intermediation spreads, currency volatility, desire to lend only short term or in foreign currency given that the sovereign average borrowing tenor is about 21¹³ months and weighted deposits mature in three months¹⁴. However, rural migration¹⁵ and fast population growth – though slowing¹⁶ – has

¹⁰ One may naturally question why an earthquake would have such a deep impact when such an event may not be as dominant in terms of impact on the real estate market in other quake prone countries like Japan, for instance. The plain answer is that while earthquakes in Eastern Turkey are rather common occurrences, they have been less frequent in and around Istanbul – Marmara region - in the past century or so. Thus, the impact of unexpected disasters on asset prices may be greater.

¹¹ The quake occurred very close to Izmit, Turkey's industrial heartland. Its effects were also visible two hundred kilometers away on the outskirts of Istanbul, the commercial center of the country.

¹² The Turkish economy had been contracting in the first half of 1999 in the wake of the contagion-effects of the August 1998 Russian devaluation and moratorium. Capital outflow leading to rising interest rates and a sharp decline in the important Russian export market were largely to blame.

¹³ Treasury borrowing instruments are separated into cash versus non-cash sales (for instance, bonds issued to loss-making state banks). Average sovereign domestic borrowing maturity comprising cash and non-cash components stood at 20.9 months as of April 2005. Bonds with the longest maturity thus far - issued for domestic borrowing - are for six years, but represent a minor portion of the domestic borrowing stock. If one looks at just the cash component, the average life of bonds issued domestically is a mere 14.1 months.

¹⁴ Refer also to Gökkent et al (forthcoming). As of May 27th, 2005, average maturity of deposits stood at 89 days. Foreign currency deposits comprised 40.4% of total deposits. Thus, banks would wish to place these deposits as foreign currency loans in order to minimize exposure to currency risk, hence the spread of FX-indexed loans.

resulted in a construction boom in cities in the past decades. Greater purchases by foreigners has also been a factor, at times controversial, in real estate markets. Foreign ownership of real estate, with some restrictions, had been permitted in Turkey on the basis of reciprocity since 1934, but a 2003 amendment easing foreign property ownership in rural areas has led to a boom in inflows, particularly evident in coastal regions in the Aegean and Mediterranean.

Macroeconomic instability has meant that most could not afford housing even under the most lenient payment schemes¹⁷. Hence, there has long been state involvement in home building. With unaffordable home prices, shanties have mushroomed¹⁸. Other avenues for finance for home purchases commonly include participation in cooperatives, where monthly payments made also determine the size of the length of time for construction. This type of arrangement is generally more affordable than buying an existing home.

Expenditures on ownership of dwellings accounted for 4.6% of GNP in 2004 according to the State Institute of Statistics. These expenditures have hovered between 4.5% and 7% of GNP since 1987¹⁹. An examination of the annual percentage change of the same series for the same period shows that this too has largely been range bound, growing in most years at an annual rate of between 1% to 3% regardless of the ups and downs of the economy²⁰. This is not to say that spending on dwellings was not affected, say in the 1994 crisis, but that impact was limited, with dwelling spending still growing albeit at a slower rate. Thus, income changes appear to have limited explanatory power over home expenditures, and, hence, home prices. An important exception occurs in the period immediately following the 1999 earthquake. The series actually registers negative growth, dipping at roughly -1% year-on-year at the start of 2000. In sum, the dictates of population growth appears to ensure spending on dwellings to be rather consistent over time.

Nominal house prices did decline²¹ sharply in the aftermath of the 1999 earthquake in the Marmara region of Turkey. This decline persisted as seismic studies suggested that the next fault line to break would be

¹⁵ SIS (2004) reports, for instance, that the population of Istanbul rose by 4% in the period between 1995 and 2000 due to net migration to the city. In 1990, 51.3% of the population lived in cities. By 2000, this had risen to 59.3%.

¹⁶ Population growth slowed from 19.7 per thousand in 1990 to 15.3 per thousand by 2003, according to the SIS.

¹⁷ See Dedes et al (2002).

¹⁸ Turkish shanties are usually one or two storey, brick, self-built structures. These are generally built on Treasury owned land and, of course, residents do not own land deeds. Frequent amnesties close to election times have legitimized some of these, however, through deed awards.

¹⁹ We also examined the same ratio for the US since 1947 and found comparable figures. The motivation was, in part, fuelled by the knowledge that food expenditures, for instance, as a percentage of national income is smaller in developed countries. It would thus be valid to question whether a similar pattern may exist with regards to “shelter”, but this does not seem to be the case.

²⁰ Tsatsaronis & Zhu (2004) report average growth of real home prices to be between 1.5% and 2.4% per annum for their sample of 17 industrialized countries since 1970.

²¹ No doubt with this effect being mostly confined to regions closest to earthquake hit areas.

closer to more densely populated areas, again in the Marmara region²². Thus, home prices fell drastically in zones that were considered to be less safe, such as in districts built in valleys, on old river beds, or in regions where the ground was not rocky²³. At the same time, higher demand for real estate on more solidly grounded areas caused prices to rise in those districts.

Meanwhile, nominal rents did not decline because of the widespread use of annual contracts²⁴. They merely stalled, temporarily flattening, but quickly bouncing back with the imposition of an exchange rate based stabilization (ERBS) scheme. Then, unraveling of this plan caused a more prolonged stagnation of rent and house prices²⁵. Kuzeybatı (2004) states that rates in the Istanbul region fell by about 30% in US\$ terms and vacancies rose after the failure of the ERBS plan in February 2001. Anecdotal evidence also suggests that the industrial property market was the worst affected amongst different real estate categories, with rents reportedly declining by 40%, again in US\$ terms. A recovery began after the November 2002 general elections by which time the economic climate had somewhat improved.

By 2005, the annual consumer price inflation fell to 8% per annum and nominal TL interest rates fell in tandem. Lower rates triggered loan demand and home prices shot up. More recently, the tenor of real estate loans provided by the private sector banks has recently risen to twelve to fifteen years, helped by a semblance of macroeconomic stability after 2001. Borrowers may choose between TL and FX indexed loans. As of this writing, a real estate price bubble is likely to be building. Rents have also skyrocketed. In sum, real estate cycles in Turkey have been occurring at rather short intervals.

Model

A vector autoregression model is employed in order to examine real estate markets in Turkey. Our variables are real estate investment partnership stock prices, per capita expenditure on real estate, rents, consumer prices, and wage expenditures. Real, deseasonalized data are quarterly from 1987 to end-2004. The choice of these variables is in some measure dictated by data constraints. Despite lacking a series on median home prices, expenditure on ownership of dwellings found in national income data provides a

²²Turkey as a whole is active seismically, but major quakes around Istanbul are recorded once in a century or so. Predictions about the threat of an inevitable break to come in the tectonic plate under Marmara Sea put some pressure on house prices in areas that are most vulnerable, but these concerns have dimmed with the passage of time.

²³ State response to the earthquake has been institution of more stringent inspections and imposition of a requirement for the purchase of home insurance.

²⁴ Both rents and home prices fell in real terms.

²⁵ As the Turkish currency slid by roughly 50% through mid-2001, equity markets reacted by rising sharply in the same period -led by export-oriented firms-, admittedly from a low base, but mostly due to the recognition that these assets were, in a sense, inflation- proof, a conclusion that is also applicable to real estate.

reasonable basis for the analysis of real estate markets²⁶. Stock prices of real estate investment partnership²⁷ firms were weighted according to trading volume and then deflated by CPI to obtain a weighted series in real terms. The series shows a sharp response to the Russian crisis, but rises with the April 1999 election results, and then reaches record highs in the first few months of the ERBS scheme in 2000. These gains are lost just as quickly after peaking in the first quarter, a pattern also observed with the broader ISE-100 index. Rental rates may be thought of as a component of the yield of real estate assets. Thus, one would expect to observe a relatively steady relationship between rental rates and home prices²⁸. Residence rent series is a sub-category in the CPI index. We deflated this using CPI to obtain the relative movement of rental rates. Growth rate of rents appear to have fallen during the 1994 crisis, then exhibit a seesaw pattern until rising sharply at the end of 1998. The series then remain steady for some time, but fall sharply again during the 2001²⁹ crisis. The inclusion of consumer prices in our model is motivated by the finding in other studies that home ownership is generally regarded as an anti-inflationary hedge. Wage expenditures were used to capture income effects. We also examined construction costs, but concluded that these have moved mostly in line with GNP changes. This may be explained in part, for instance, by taking into account that labor costs are likely to decline in recessionary periods and rise during expansions.

$$\begin{aligned}\Delta \text{home price}_t &= \alpha(L) \text{home price}_{t-1} + \beta(L) \Delta \text{Ind}_{t-1} + sd1 + sd2 + sd3 + \varepsilon_{t-1} \\ \Delta \text{Ind}_{t-1} &= \alpha(L) \Delta \text{Ind}_{t-1} + \beta(L) \text{home price}_{t-1} + sd1 + sd2 + sd3 + \eta_{t-1} \quad (1)\end{aligned}$$

We have specified an unrestricted VAR model comprising salient indicative variables, shown below, in order to examine a shock's dynamic impact on home prices. The Cholesky method – in which the order of the variables is important – has been used in our analysis. In the absence of data on home prices, we have assumed that per capita home expenditures might be a reasonable proxy for home price movements for VAR analysis.

A one period lag was deemed appropriate for our analysis on the basis of Granger Causality and Lag Selection Criteria results. In addition, the stability of the VAR model was tested using the AR root table below.

²⁶ Per capita home expenditure data were obtained by dividing expenditure on ownership of dwellings by population. Since population data were available only as annual estimates, quarterly data were obtained by assuming that the population growth rate for the year would be evenly spread over the year.

²⁷ Akin to real estate investment trusts (REITs).

²⁸ Kranier (2003) states that the price to rental ratio in the US has been pretty steady. While also applicable to Turkey, there is likely to have been more volatility in the latter mainly due to sharp swings in the numerator of this ratio.

²⁹ While currency devaluation took place in February of that year, a systemic banking crisis had already struck by November 2000.

Table 1: Roots of Characteristic Polynomial

Root	Modulus
0.041139 + 0.762471i	0.763580
0.041139 - 0.762471i	0.763580
0.491514 - 0.500946i	0.701807
0.491514 + 0.500946i	0.701807
-0.327762 + 0.613112i	0.695222
-0.327762 - 0.613112i	0.695222
-0.592243	0.592243
0.285014 + 0.381138i	0.475919
0.285014 - 0.381138i	0.475919
-0.461243	0.461243

No root lies outside the unit circle. VAR satisfies the stability condition. Lag specification: 1

Source: Authors' estimates

According to the *inverse* roots of the characteristic AR polynomial result, the selected VAR model with 1 lag is stationary. The estimated VAR is stable (stationary) if all roots have modulus less than one and lie inside the unit circle. If the VAR is not stable, certain results (such as impulse response standard errors) are not valid³⁰.

Results indicate that 25-34% of the variance in per capita home expenditures (HOME EXP) is explained by consumer price index (CPI) movements, 15-17% by real estate investment partnership share prices (REIP), 12-15% by our relative rent price index (RENT), and only 2 to 9% by wage expenditures (WAGE EXP).

Table 2 – Variance Decomposition of Home Expenditures

Period	S.E.	WAGE EXP	REIP	CPI	RENT	HOME EXP
1	0.003177	3.267850	0.160443	10.21653	2.071120	84.28406
2	0.004313	1.997282	4.644083	34.16072	1.270035	57.92788
3	0.005277	2.751422	16.08587	26.16236	15.11492	39.88543
4	0.005474	6.977356	15.02453	26.20980	14.43907	37.34924
5	0.005644	6.698906	17.98121	26.09149	13.94261	35.28578
6	0.005971	8.639139	17.59735	26.94142	12.45575	34.36634
7	0.006038	8.671710	17.32514	26.37954	12.41648	35.20713
8	0.006078	9.290182	17.54067	26.09964	12.27790	34.79160
9	0.006132	9.871784	17.75005	25.64799	12.24211	34.48807
10	0.006145	9.842367	17.75408	25.79052	12.18956	34.42347

Source: Authors' estimates

³⁰ Refer to Lütkepohl (1991).

The importance of innovations in CPI in accounting for a relatively larger share of the variability in home expenditures is consistent with other studies, and is a reflection of the importance of macroeconomic stability. Thus, home ownership is regarded as an anti-inflationary hedge. The result for wage expenditures, again, supports the finding in other country studies that income change is not the most important variable that affects home prices, or, for the purposes of our study, per capita home expenditures. A boom in housing loans is a new phenomenon in Turkey which may have spurred per capita home expenditures as well, but is excluded from our model because insufficient time has passed for it to fully reflect on the results of our model. Future studies may investigate microeconomic factors that affect the real estate markets in Turkey as data availability becomes less of an issue.

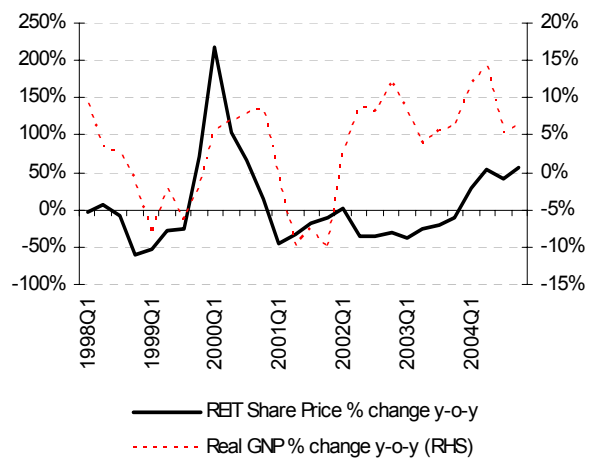
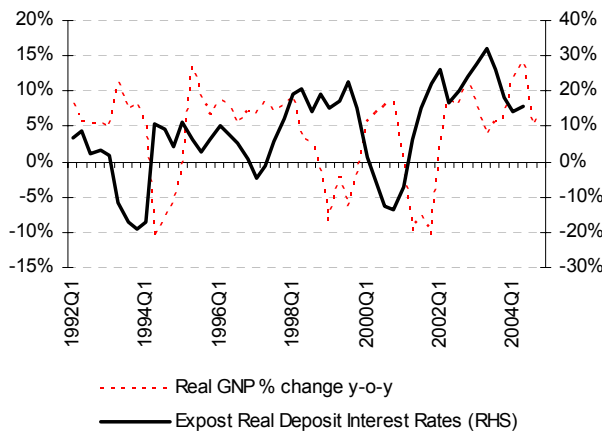
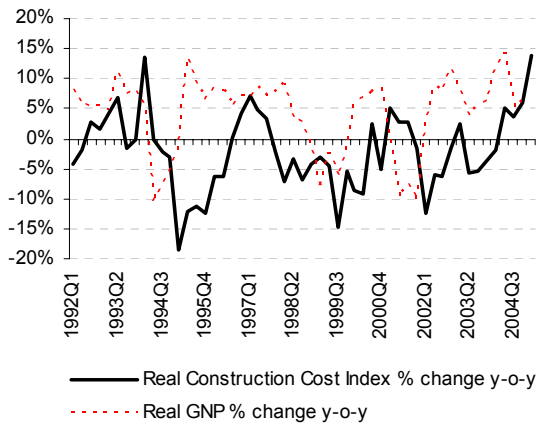
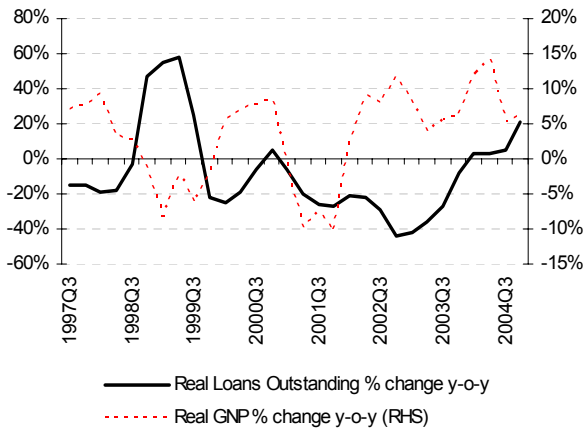
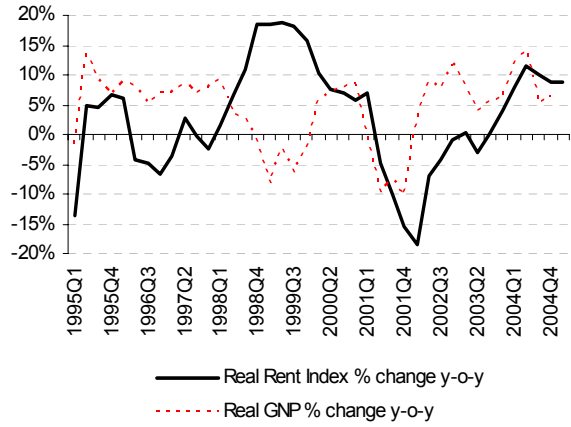
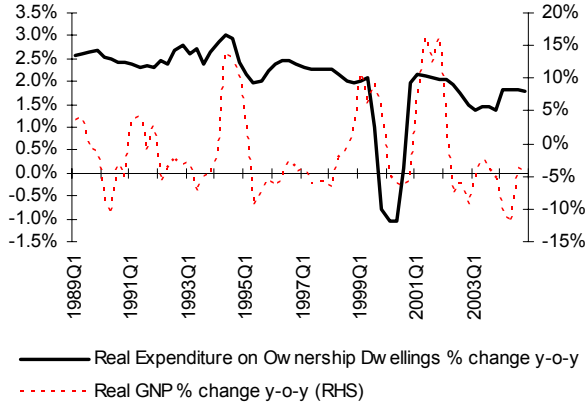
Conclusion

A vector autoregression model is employed in order to examine the factors – with emphasis on macroeconomic variables - that affect real estate markets in Turkey. Changes in per capita expenditures on ownership of dwellings are used to proxy for home price movements. Results indicate that 25-34% of the variance in per capita home expenditures is explained by consumer price index movements, 15-17% by real estate investment partnership share prices, 12-15% by a relative rent price index, and a mere 2 to 9% by wage expenditures. The importance of innovations in CPI in accounting for a relatively larger share of the variability in home expenditures is consistent with other country studies, and is a reflection of the importance of macroeconomic stability, or in other words, the importance of home ownership as an anti-inflationary hedge. The result for wage expenditures indicates that income change is not crucial in determining home prices, or, for the purposes of our study, per capita home expenditures. Recent developments in the housing loan market suggest that a loan boom may have raised housing prices sharply, but the relatively few observations in our data set depicting this phenomenon fail to translate into significant results in a VAR model.

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Appendix A



Source: SIS, CBRT, authors' calculations