

Housing Bubbles and Economic Fundamentals



LUIS B. TORRES
RESEARCH ECONOMIST



REAL ESTATE CENTER
TEXAS A&M UNIVERSITY

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Luis B. Torres

Research Economist



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House prices in the United States increased dramatically in the years prior to 2007. During the housing boom, many economists and policy-makers argued that a bubble did not exist. They believed numerous fundamental factors — job and income growth, low mortgage rates, demographics and restricted supply — were behind the increase in house prices, making a substantial nationwide decline in house prices improbable. But overly optimistic expectations about future house price growth, along with government policies, led to a relaxation in lending standards. Lenders and borrowers alike expected house price appreciation to continue indefinitely.

This resulted in a housing bubble. In regions where housing prices registered the highest increases, past price performance had a significant influence on subsequent loan approval rates. When price expectations did not materialize, the bubble burst, setting off a chain of events that produced a global financial and economic crisis comparable only to the Great Depression of the 1930s.

Like stock prices, house prices have boom and bust cycles because market participants tend to expect higher future returns when prices are high relative to fundamentals. “Irrational exuberance” comes into play when buyers and sellers in the midst of a bubble expect high future returns because they extrapolate recent price behavior into the future. This is fueled further by buyers’ perception that housing investment entails little risk of price declines.¹

So why couldn’t the housing bubble be identified and subsequently avoided? The problem with bubbles is that they cannot be identified with any certainty or confidence. If they could be, they would never form in the first place. Instead, the market would respond by selling assets to avoid future losses rather than purchasing homes at high prices. Identifying the beginning of a bubble requires extraordinary insight into the functioning of a market that even highly knowledgeable and specialized market participants lack.

Housing Bubble Concept

Bubbles have occurred throughout history in many countries and various asset markets. In the case of real estate markets, the widespread use of the term “housing bubble” is relatively new. The term “housing bubble” first appeared in the media in 2000, as speculation mounted of a bubble forming during the housing boom.²

Bubbles are defined as market participants’ expectations of high future prices that are not aligned with economic fundamentals but instead are based on recent trends of high-growth performance. The concept of a bubble is based

on the public’s (1) expectations that prices will continue to increase; (2) theories about the risk of falling prices; and (3) worries about being priced out of the future housing market if they don’t buy today. During a housing price bubble, homebuyers’ ideas about affordability are distorted; a home once considered too expensive is seen as an acceptable purchase. Furthermore, buyers perceive little risk in purchasing a home because they consider a fall in housing prices unlikely.

Bubbles require market participants to have access to funds to finance their inordinate asset purchases. As housing prices escalate, concerns arise that a lack of fundamentals was behind the high price increases.³ But a rapid increase in prices doesn’t necessarily imply a bubble.⁴

Some economists argue that asset bubbles cannot exist based on the theory of rational and efficient markets. In an efficient market, one cannot predict future house prices based on past housing prices because the current price should reflect all existing information relevant to the price of the home. A rational homebuyer with low risk premium would expect low future returns after a prolonged price increase versus an irrational, exuberant homebuyer who during a bubble would expect higher returns simply by inferring recent price performance into the future. The economic models based on these theories have shown striking inconsistencies between theory and evidence. Often, the simplest model with the unrealistic assumptions that market participants based future price performance on past price performance yields sharp insight into how a market or an economy works during a bubble. Interestingly, there’s always a reason that what looks like a bubble is not really a bubble.

Unfortunately, asset price bubbles and crashes in stocks and housing are here to stay, as human nature appears to play an important role in the shaping of speculative bubbles. The events of the recent housing bust demonstrate the enormous economic and financial costs associated with asset price bubbles and crashes. Though it is difficult to determine the existence of bubbles, economic fundamentals are important tools that can help in detecting them. This is especially true in the housing market, because the underlying fundamentals of supply and demand can be used.

Housing as Investment Asset

The investment motive for purchasing a home plays an important role in the creation of housing bubbles. Such bubbles are more likely when housing is viewed more as an investment asset than shelter, which is a consumption

good.⁵ That is, when people buy homes hoping to reap the gains of future price increases rather than for the benefits and pleasure of living in the home, a bubble can form.

The investment motive for purchasing a home is said to play an important role in housing bubbles. Popular misconceptions about housing investment include:

- bubbles cannot form in single-family residential real estate;
- single-family residential real estate is an investment that cannot lose money;
- single-family residential real estate is a candidate for the “best investment” that can be made;⁶
- high-priced housing (such as a beach house) typically has higher price rate increases than other properties perceived as less valuable; does not necessarily translate into higher price increase rates versus other properties;
- when housing is in short supply, home prices become irrelevant and can increase indiscriminately; and
- when selling prices are higher than list prices, economic fundamentals determining supply and demand are no longer valid, and home prices can increase continuously.

With the investment motive, factors such as return on alternative assets and expectations on future changes in house prices are important, especially if the purchase is a vacation home, and the buyers are not planning to live there permanently. Speculation in housing investment is a determining factor in the creation of bubbles and contributes to their instability as the investment motive weakens.⁷ When the attractiveness of housing as an investment deteriorates in fear of price declines, a bubble can burst. The widespread inclination of market participants to view housing as an investment asset is a defining characteristic of a housing bubble.

Even after the Great Recession, homeowners continue to perceive housing to be a stable investment relative to the stock market, given that declines in nominal house prices are rare compared with stock prices (Figure 1). This important difference between housing markets and stock markets, as well as most asset markets, is based on the fact that home prices are sticky downward.⁸ That is, when excess supply occurs, prices do not immediately fall, allowing the market to find a new equilibrium and clear. Rather, sellers have “reserve” prices that they are not willing to go below.

Conventional wisdom says the spread between the listing price and the selling price widens when demand drops, accompanied by a fall in the number of transactions and by an increase in days on the market, suggesting that sellers resist lowering prices. This tendency is linked to the misconception that housing prices never decline, and with other beliefs that may lead to a housing bubble.

Another difference between stock and housing markets is that purchasing and sell-

ing homes involve high transaction costs, both in money and in time spent, making it less likely that a buyer or seller can take advantage of a mispriced home. But, if mortgage financing becomes less tight, increasing access to mortgage credit with shorter approval times and lower transaction costs, market participants could bid up prices before the bubble bursts. Such mortgage market conditions were observed leading up to the most recent financial crisis.

According to standard asset price theory, the price of a house should be related to current and future rents that the house could earn if it were rented and the interest rate. That is, the price of a house would be estimated as follows:

$$\text{Home price}_t = \text{Rent}_t + \frac{\text{Rent}_{t+1}}{(1+i)} + \frac{\text{Rent}_{t+2}}{(1+i)^2} + \dots$$

where t = period of time and i = interest rate.

Thus, an increase in home prices must reflect either an increase in expected future rent growth or a reduction in expected interest rate (return on assets). Future rents would be determined by economic fundamentals such as household income, demographics, employment, government housing regulation and tax policy. Interest rates would be influenced by inflation and monetary policy of the Federal Reserve. Another way to express this is that changes in house prices are determined by changes in rents minus changes in interest rates. That is:

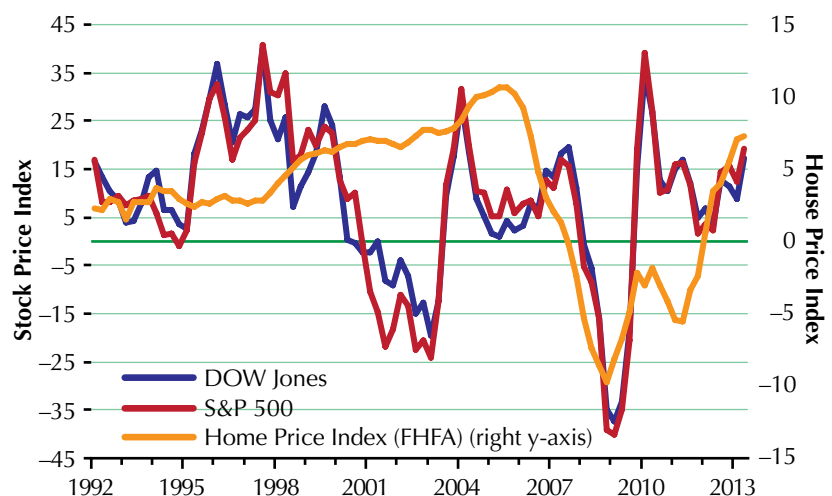
$$\% \Delta \text{ Home price} = \% \Delta \text{ Rent} - \% \Delta \text{ Interest rate}$$

where $\% \Delta$ = percentage change.

Housing Market Fundamentals

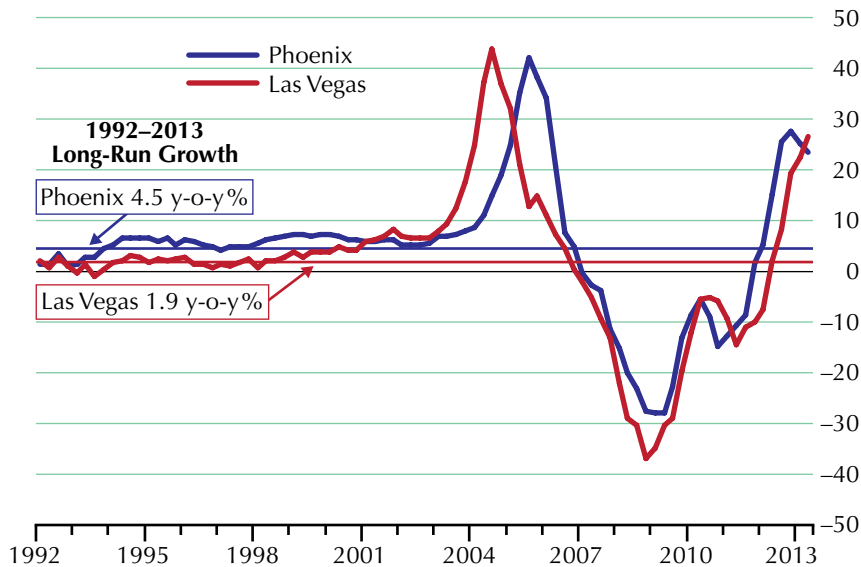
Housing prices are determined by supply and demand. On the demand side, factors influencing pricing include demographics, income growth, employment growth, changes in financing mechanisms or interest rates, as well as tastes and preferences, such as location, schools, crime statistics and accessibility. For example, a household's

Figure 1. Stock and U.S. House Price Index (Year-Over-Year Percent)



Note: Estimated by the Real Estate Center at Texas A&M University. Sources: Federal Housing Finance Agency and FRED St. Louis Fed

Figure 2. FHFA Phoenix and Las Vegas House Price Index (Year-Over-Year Percent)



Notes: Estimated by the Real Estate Center at Texas A&M University. Home Price Index MSA Phoenix-Mesa-Scottsdale, Arizona and MSA Las Vegas-Henderson-Paradise, Nevada.
Source: Federal Housing Finance Agency (FHFA)

income might increase, allowing the family to purchase a first home or move to a larger home; a large proportion of the population could be forming new households (as is the case in Texas, with its rapidly growing population); or mortgage rates could fall.

On the supply side are factors such as construction costs (price of inputs such as lumber, drywall and labor wages), interest rates, age of the housing stock, building technology, land availability and the industrial organization of the housing market. If technology used in home construction improves, new homes may be built at a lower cost and at a faster rate. Land availability for new housing development projects also would affect home prices.

Elasticity of supply — the responsiveness of new home construction to changes in home prices, is a key factor in the cyclical behavior of home prices. If home supply is elastic, any small change in housing prices can be matched by an increased supply. Indeed, if demand for housing increases upward pressure on home prices, the quantity

of new homes built can be increased to satisfy demand, eliminating pressure for home prices to continue to rise. Because building a house is time consuming and changes in demand are not easy to identify, there is normally a lag between the rise in house prices and the increase in supply in the short run that drives the price back down. However, in the long run, the profit incentive ensures that supply will increase to meet demand.

When home price increases are not based on changes in the economic fundamentals that determine underlying supply and demand, a bubble is said to exist.⁹ This increases the possibility that housing prices could suddenly collapse when market participants realize that their expectations of continuously increasing future home prices will not be met.

Home prices growing at a rapid rate is not in itself conclusive evidence of

a bubble. It is, however, a good indicator that the price increases are not based on economic fundamentals, especially if price increases for that region do not reflect overall historical price trends. This was evident in Phoenix and Las Vegas where home prices leading up to the housing bust (2002 to 2006) grew at high rates versus historical price increases for those regions (Figure 2). During that period, U.S. home prices also registered a higher rate of growth than previously observed (Table 1).

So how did economic fundamentals behave? Can they explain the rapid price increases?

From 2002 to 2006, both Phoenix and Las Vegas registered faster growth in population, employment and income on average than their respective average historical trends and the nation (Tables 2, 3, 4). The United States, however, did not outperform its past 20-year average historical trend with respect to population and employment growth. Only GDP per capita registered a relatively higher average growth rate during that period.

Table 1. Home Prices, 1992 to 2013

Region	1992–2013		1992–2002		2003–13		2002–06		2010–13	
	q-o-q %	y-o-y %	q-o-q %	y-o-y %	q-o-q %	y-o-y %	q-o-q %	y-o-y %	q-o-q %	y-o-y %
United States	0.8	3.2	1.1	4.4	0.4	1.9	1.9	8.2	0.2	-0.1
Arizona	0.9	4.0	1.3	5.0	0.6	3.0	3.4	14.8	0.8	0.9
Phoenix-Mesa-Scottsdale	1.0	4.5	1.3	5.4	0.7	3.6	3.5	15.6	1.4	3.9
Nevada	0.5	2.2	0.9	3.4	0.0	1.0	3.4	15.5	0.6	-0.7
Las Vegas-Henderson-Paradise	0.4	1.9	0.8	3.0	0.0	0.8	3.5	16.1	0.9	-0.1
Texas	0.9	3.4	1.0	3.9	0.7	2.9	1.1	4.1	0.7	2.1
Austin-Round Rock	1.3	5.2	1.6	6.6	1.0	3.8	1.0	3.5	1.0	3.1
Dallas-Plano-Irving	0.8	3.0	1.0	3.8	0.6	2.1	0.7	3.0	0.6	2.1
Fort Worth-Arlington	0.7	2.7	0.9	3.5	0.5	1.8	0.8	3.1	0.4	1.3
Houston-The Woodlands-Sugar Land	1.0	4.0	1.0	4.1	1.0	3.9	1.1	4.5	1.2	4.2
San Antonio-New Braunfels	1.0	3.8	0.9	3.7	1.0	3.9	1.5	6.0	1.0	2.4

Notes: Estimated average percent changes. q-o-q % = quarter-over-quarter percent change and y-o-y % = year-over-year quarterly percent change. 2Q 2013.
Sources: Real Estate Center at Texas A&M University and Federal Housing Finance Agency

Table 2. Population, 1992 to 2012

Region	1992–2012 y-o-y %	2002–12 y-o-y %	2002–06 y-o-y %	2010–12 y-o-y %
United States	1.0	0.9	0.9	0.8
Arizona	2.6	2.0	2.7	1.1
Phoenix-Mesa-Scottsdale	3.0	2.3	3.1	1.4
Nevada	3.7	2.4	3.8	0.9
Las Vegas-Henderson-Paradise	4.4	2.9	2.9	1.0
Texas	1.9	1.8	1.8	1.7
Austin-Round Rock	3.6	3.0	2.9	2.5
Dallas-Fort Worth	2.4	2.1	2.3	1.3
Houston-The Woodlands-Sugar Land	2.2	2.2	2.5	1.7
San Antonio-New Braunfels	2.1	2.3	2.1	2.5

Note: Estimated average y-o-y % = year-over-year percent change.
Sources: U.S. Census Bureau and Bureau of Economic Analysis

Table 3. Employment, 1992 to 2013

Region	1992–2013 y-o-y %	2003–13 y-o-y %	2002–06 y-o-y %	2010–13 y-o-y %
United States	1.0	0.4	0.6	0.9
Arizona	2.5	1.0	3.1	0.7
Phoenix-Mesa-Scottsdale	2.7	1.1	3.4	1.0
Nevada	2.9	1.0	4.0	0.3
Las Vegas-Henderson-Paradise	3.8	1.4	4.8	0.3
Texas	2.0	1.6	1.1	2.0
Austin-Round Rock	3.5	2.4	1.4	2.9
Dallas-Plano-Irving	2.1	1.2	0.4	2.0
Fort Worth-Arlington	2.1	1.5	1.1	2.3
Houston-The Woodlands-Sugar Land	2.0	1.8	1.4	2.4
San Antonio-New Braunfels	2.3	1.5	1.5	1.6

Notes: Estimated average percent changes. y-o-y % = year-over-year monthly percent change. Total nonfarm employment. August 2013.
Source: Bureau of Labor Statistics

So how about other fundamentals such as ratios of home prices to median income and annual rent ratios? The ratio of home price to median income for both Phoenix and Las Vegas showed a sharp increase from 2002 to 2006, as it did to a lesser degree for the United States (Figure 3). This is also true for the ratio of home price to annual rents, which registered an acute increase during that period for both the Phoenix and Las Vegas regions (Figure 4). These increases were a signal that price increases were not based on economic fundamentals related to median household income and annual rents and that a housing bubble had formed in those regions and the United States as a whole.

In contrast to what was observed in states like Arizona and Nevada, the Texas housing market did not register such rapid home price increases during the housing boom cycle and was more in line with past price behavior for the region (Table 1). In Texas and its major MSAs, population and employment grew faster than in the United States from 2002 to 2006 but was below its average historical trend (Tables 2, 3, 4). By contrast, GDP per capita for Texas and its major MSAs grew at a lower average rate compared

Table 4. GDP Per Capita, 2001 to 2012

Region	2002–12 y-o-y %	2002–06 y-o-y %	2010–12 y-o-y %
United States	-0.7	1.6	1.4
Arizona	-0.1	2.4	0.3
Phoenix-Mesa-Scottsdale	0.0	2.4	0.4
Nevada	0.2	2.2	0.0
Las Vegas-Henderson-Paradise	-0.4	2.5	-0.6
Texas	-1.0	0.8	2.5
Austin-Round Rock	1.6	2.6	2.9
Dallas-Fort Worth	0.7	1.2	2.1
Houston-The Woodlands-Sugar Land	0.4	-0.5	2.1
San Antonio-New Braunfels	0.5	0.7	2.3

Notes: Estimated average percent changes. y-o-y % = year-over-year percent change.
Source: Bureau of Economic Analysis

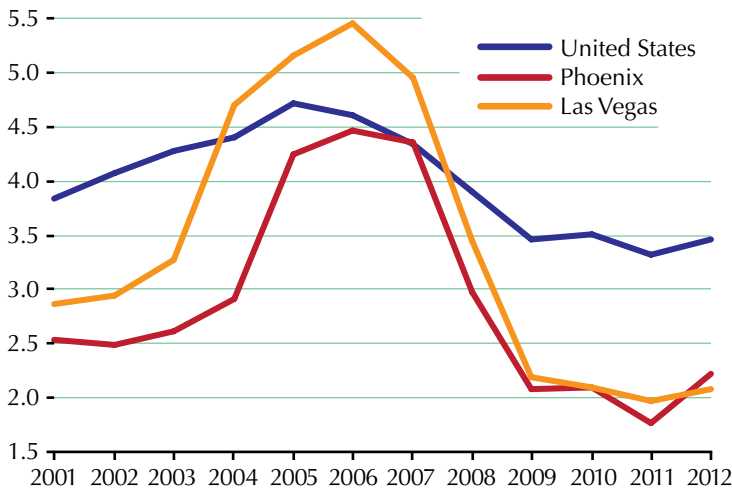
with the nation, with the exception of Austin, which grew faster during that period but was higher than its ten-year average from 2002 to 2012, and Houston, where GDP per capita decreased. Ratios between home prices and median income and annual rents recorded small increases between 2006 and 2007 and, although they are higher, they still correspond to the behavior observed in previous years (Figures 5, 6). This indicates that home prices in the state were more aligned with economic fundamentals. From 2010 to the latest data available in 2013, Texas housing prices also appear to be based on economic fundamentals.

The Bottom Line

Identifying a bubble with certainty would require special insight into the functioning of the market that even highly specialized and knowledgeable participants lack. Supply and demand determinants change over time, so there is no safe way of knowing what prices should be. Still, when analyzing long-run trends in asset prices, especially in home prices, their relationship to economic fundamentals

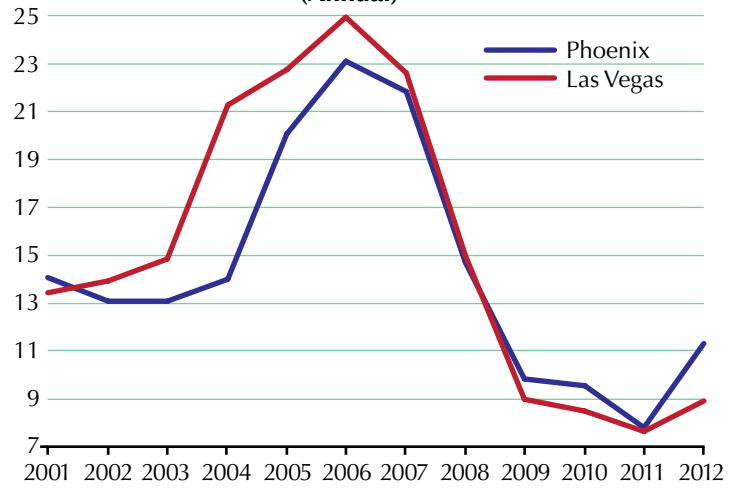
can provide insight into the forming of a bubble. The investment motive plays an important role in the creation of housing bubbles. In Texas, current home prices are based on strong fundamentals, but one must be careful when expectations start to exceed real outcomes and try to extrapolate current price increases into the future. That assumption has proven dangerously incorrect.

Figure 3. Home-Price-to-Median-Household-Income Ratio for United States, Phoenix and Las Vegas (Annual)



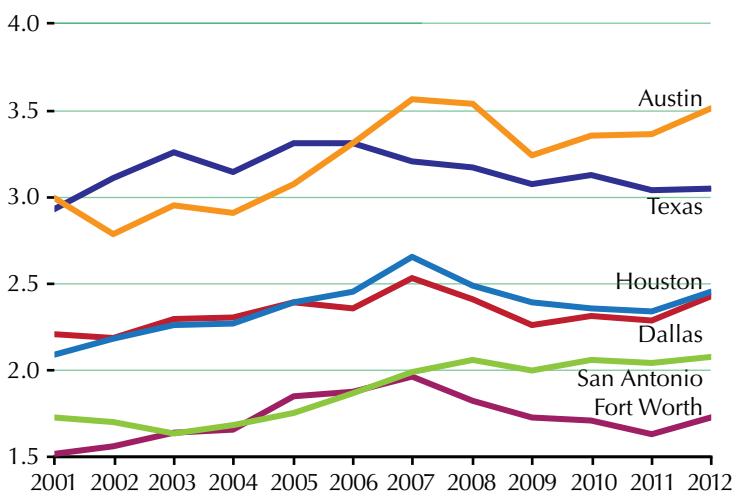
Note: Estimated by the Real Estate Center at Texas A&M University.
Sources: National Realtors Association and U.S. Department of Housing and Urban Development

Figure 4. Home-Prices-to-Rents Ratios for Phoenix and Las Vegas (Annual)



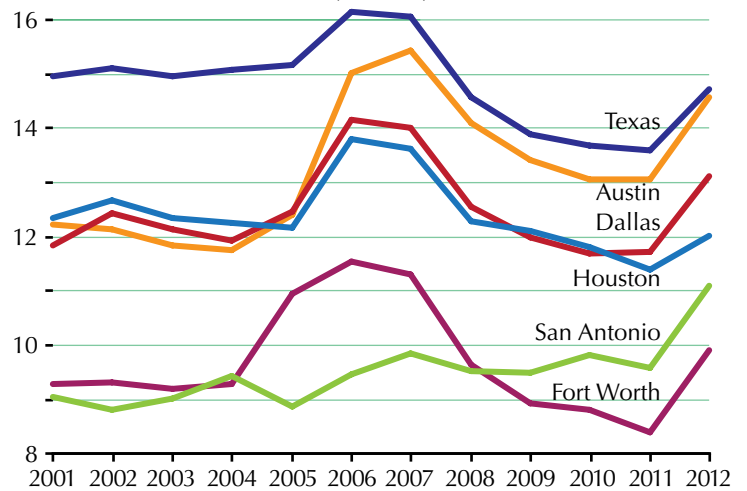
Note: Estimated by the Real Estate Center at Texas A&M University.
Sources: National Realtors Association and the U.S. Department of Housing and Urban Development

Figure 5. Texas Home-Prices-to-Median-Household-Income Ratios (Annual)



Note: Estimated by the Real Estate Center at Texas A&M University.
Sources: Real Estate Center at Texas A&M University and U.S. Department of Housing and Urban Development

Figure 6. Texas Home-Prices-to-Rents Ratios (Annual)



Note: Estimated by the Real Estate Center at Texas A&M University.
Sources: Real Estate Center at Texas A&M University and U.S. Department of Housing and Urban Development

Endnotes

^{1,5} Jurgilas, Marius and Lansing, Kevin J. "Housing Bubbles and Expected Returns to Homeownership," Paper presented at "Property Prices and Real Estate Financing in a Turbulent World," Société Universitaire Européenne de Recherches Financières (SUERF), Nykerdit, and Danmarks Nationalbank, November 15, 2012.

^{2,4,7,8,9} Case, Karl E. and Shiller, Robert E. "Is There a Bubble in the Housing Market," *Brookings Papers on Economic Activity*, 2, 2003, pp. 299–362.

³ Gelain, Paolo and Lansing Kevin J. "House Prices, Expectations, and Time-Varying Fundamentals," Federal Reserve Bank of San Francisco, Working Paper Series 2013–03, July 2013.

⁶ Whether in fact it is the best possible investment cannot be determined when compared to other assets given the differences between purchasing a home versus a stock or other financial assets.



MAYS BUSINESS SCHOOL

Texas A&M University
2115 TAMU
College Station, TX 77843-2115

<http://recenter.tamu.edu>
979-845-2031

DIRECTOR

GARY W. MALER

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