



**Market Estimation Model for the 2012 - 2014 Enterprise Single-Family
Housing Goals**

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PREFACE

This Federal Housing Finance Agency (FHFA) research paper discusses the forecast models used in establishing housing goal benchmarks for 2012 through 2014. The paper is part of FHFA's ongoing effort to enhance public understanding of the nation's housing finance system. The paper was prepared by Jay Schultz of the National Mortgage Database Team.

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Market Estimation Model for the 2012 - 2014 Enterprise Single-Family Housing Goals

A. INTRODUCTION

In establishing benchmarks for the 2012 through 2014 single-family mortgage housing goals for Fannie Mae and Freddie Mac (the Enterprises), the Federal Housing Finance Agency (FHFA) is required to measure the size of the mortgage market. This paper documents the methodology used to establish the market size for the Low-Income Borrower Home Purchase Housing Goal (share of borrowers with incomes no greater than 80 percent of the area median income (AMI)), the Very Low-Income Borrower Home Purchase Housing Goal (share of borrowers with incomes no greater than 50 percent of AMI), the Low-Income Area Home Purchase Housing Subgoal (share of borrowers living in low-income areas (where census tract median income is no greater than 80 percent of AMI) and high minority areas), and the Low-Income Borrower Refinance Housing Goal (share of borrowers with incomes no greater than 80 percent of AMI).¹

The housing goals are defined in terms of percentages of mortgages on owner-occupied properties, either home purchase or refinance, acquired during a calendar year. For example, the low-income borrower home purchase goal is expressed as the percentage of home purchase mortgages where the borrower's income is no greater than 80 percent of the area median income. Likewise, the low-income borrower refinance mortgage acquisitions are relative to all owner-occupied property refinance mortgages acquired.² The market is estimated in terms of

¹ High minority areas are defined as census tracts where the percent minority is at least 30 percent of the population and the census tract median income is less than AMI. There is also a provision for designated disaster areas in the Low-Income Areas Home Purchase Goal (see Section E).

² To be eligible to count toward the housing goals, mortgages acquired have to meet certain counting rules. These counting rules are defined in 12 CFR 1282.

percentages of mortgage originations.³ The results of the market estimation model are provided in **Table 1** where, for example, it expected that 27.0 percent of home purchase mortgage

Table 1
Enterprise Single-Family Housing Goals
Market Estimates 2011 - 2013

Year ¹	Low-Income Borrower Home Purchase Goal	Very Low-Income Borrower Home Purchase Goal	Low-Income Area Home Purchase Subgoal	Low-Income Borrower Refinance Goal
2004	27.2%	6.6%	16.7%	28.0%
2005	24.2%	5.7%	15.3%	26.0%
2006	24.0%	5.9%	15.8%	24.7%
2007	26.0%	6.1%	16.2%	24.2%
2008	25.3%	6.5%	14.1%	23.4%
2009	29.6%	8.8%	13.0%	20.8%
2010 ²	27.2%	8.1%	12.1%	20.2%
2011 ²	26.5%	8.0%	11.4%	21.5%
2010-11 Benchmarks³	27%	8%	13%	21%
2012 ⁴	27.0% ± 2.7%	8.3% ± 1.3%	11.8% ± 2.0%	19.9% ± 3.4%
2013 ⁴	26.3% ± 4.1%	8.2% ± 2.1%	11.9% ± 3.8%	22.6% ± 5.5%
2012-14 Benchmarks⁶	23%	7%	11%	20%

¹Historical market performance is based on historical HMDA data for first-lien, conventional, ARRA-equivalent conforming limit loans, excluding higher-cost and HOEPA loans (see Section B).

²The refinance goal market performance does not include the impact of loan modifications.

³The 2010-11 refinance goal benchmark includes a +200 basis point adjustment to account for the impact of loan modifications on Enterprise performance.

⁴Estimated (95% confidence), does not include adjustment for loan modifications.

⁵Estimated (95% confidence), primarily a function of time trends, does not include adjustment for loan modifications.

⁶Final.

³ The size of the market for each goal shall be established annually by FHFA based on data reported pursuant to the Home Mortgage Disclosure Act for a given year. Unless otherwise adjusted by FHFA, the size of the market shall be determined based on the following criteria: (1) Only owner-occupied, conventional loans shall be considered; (2) Purchase money mortgages and refinancing mortgages shall only be counted for the applicable goal or goals; (3) All mortgages flagged as HOEPA loans or subordinate lien loans shall be excluded; (4) All mortgages with original principal balances above the conforming loan limits for single unit properties for the year being evaluated (rounded to the nearest \$1,000) shall be excluded; (5) All mortgages with rate spreads of 150 basis points or more above the applicable average prime offer rate as reported in the Home Mortgage Disclosure Act data shall be excluded; and (6) All mortgages that are missing information necessary to determine appropriate counting under the housing goals shall be excluded. (12 CFR 1282.12(b))

originations on owner occupied properties will be made to low-income borrowers in 2012. While the housing goal benchmarks will extend to 2014, data are only sufficient to estimate market performance through 2013. Based on the information available today, affordability levels estimated for the 2012-2013 period are expected to extend through 2014. The remainder of this paper describes the methodology used to produce the housing goal share market estimates in Table 1.

Section B provides background and descriptions of the economic drivers in the mortgage market. Section C describes the data used in estimating the market size models and Section D reviews the economic and market forecast data used to project the market size of each of the single-family mortgage housing goals. Section E presents the four econometric time series models used to estimate market size. The market estimates for all four goals are adjusted to remove the impact of manufactured housing chattel loans, as discussed in Section F. Finally, conclusions are provided in Section G.

B. BACKGROUND

The Housing and Economic Recovery Act of 2008 (HERA) mandates that, beginning in 2010, FHFA establish a new set of housing goals.⁴ No longer are there goals based on the entire single-family and multifamily mortgage market, as was the case for the goals prior to 2010. The goals for the single-family mortgage market are based on mortgages acquired, as opposed to the previous unit-based goals. There are now separate goals for home purchase mortgages and refinance mortgages and only mortgages associated with 1-4 unit owner-occupied properties are counted. The housing goal benchmarks for 2010 and 2011 were set by regulation in 2010.⁵

Expectations for 2012 to 2013 are for modest improvements in the single-family mortgage market environment. Quantifiable factors influencing FHFA's outlook for the mortgage market include general growth in the economy, employment, inflation, and the interest rate environment. Industry observers expect subprime market activity to remain minimal through 2013. The Federal Housing Administration (FHA) insured mortgage market share is expected to continue to be a major factor in the affordability levels in the conventional market as FHA loans will continue to be an attractive option for low-income homebuyers.

Several factors can have a direct or indirect impact on the affordability of home purchases or the refinancing of mortgages. The effects of unemployment, FHA market share, refinancing, interest rates, house prices, the overall housing market, manufactured housing, and the market outlook are discussed below.

Interest Rates. Affordability in the mortgage market relies in part on the interest rate environment. Mortgage interest rates are impacted by many factors. Interest rates on longer term financial instruments such as mortgages typically follow the fluctuations of the 10-Year

⁴ 12 U.S.C. 1331(a)

⁵ 12 CFR 1282.12.

Treasury Note yield, with a 190 basis point spread reflecting the differences in liquidity and credit risk in 2012 and 180 basis points expected in 2013. With uncertainty in the financial markets of the European Union, the U.S. financial markets have seen increased demand as financial instruments here are seen as a “safe haven.” Overall, interest rates in the United States are heavily influenced by the monetary policies of the Federal Reserve Board’s Federal Open Market Committee (FOMC). During the current economic environment, since mid-2008, the FOMC has maintained an accommodative monetary policy in support of its dual mandate, of fostering maximum employment and price stability. In its September 12-13, 2012 meeting, the FOMC stated that it is committed to a low federal funds rate policy (at 0 to 0.25 percent) through mid-2015, “[t]o support continued progress toward maximum employment and price stability, the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens.”⁶ This accommodative monetary policy, combined with the international demand for U.S. financial instruments, has led to historically low interest rates in the mortgage market. The longer term 30-year fixed-rate mortgage interest rate has fallen from 4.9 percent at the beginning of 2011 to 3.49 percent in Freddie Mac’s September 20, 2012 Primary Mortgage Market Survey. Shorter term fixed- and adjustable-rate mortgage interest rates remain at historical lows, for example on September 20, 2012, Freddie Mac reported that the average one-year adjustable-rate mortgage rate was 2.61 percent. As a major contributor to the cost of mortgage financing, lower interest rates directly affect the affordability of buying a home or refinancing a mortgage. As the economic recovery strengthens in the near future and the European situation stabilizes it is expected that interest rates, particularly longer term interest rates, will rise. For the 2012-2013

⁶ Federal Open Market Committee, [Press Release](#), September 13, 2012.

period, forecasts show that all interest rates are expected to remain at historical lows, including the interest rate on a 30-year fixed-rate mortgage, which is expected to fall to 3.6 percent by the fourth quarter of 2012 and to reach only 3.9 percent by the fourth quarter of 2013.

Unemployment. In addition to being an indicator of the health of the economy in general, the employment situation affects the housing market more directly because buying a house is considered a large investment and a long-term commitment that requires stable employment. Nonfarm payroll employment increased by 96,000 in August 2012. The unemployment rate has steadily fallen from 9.1 percent in August 2011 to 8.2 percent in August 2012.⁷ While the unemployment rate is still historically high, however, it is down 200 basis points from the October 2009 high mark. To the extent that lower-income jobs are affected more by the employment situation, the affordable home purchase market is affected.

House Prices. Trends in house prices influence the housing and mortgage markets. In periods of house price appreciation, home sales and mortgage originations increase as the expected return on investment rises. In periods of price depreciation or price uncertainty, home sales and mortgage originations decrease as risk-averse homebuyers are reluctant to enter the market. House prices generally fell during 2009 through 2011, but are expected to end 2012 up slightly from the fourth quarter 2011. House prices are expected to continue with modest increases through 2013. Industry forecasts show an increase in the S&P/Case Shiller Home Price Index of 1.5 percent in 2012 and 1.6 percent in 2013 – the first annual increase in the price index since 2006.

Housing Market. An active housing market is generally good for the affordable home market. When there are more homes for sale, potential home buyers have more options,

⁷ Bureau of Labor Statistics, News Release: The Employment Situation – August (September 7, 2012).

prices tend to be more competitive and the search costs to find affordable housing decrease.

Total home sales reached a 10-year annual low in 2010 at 4.5 million units. Home sales increased slightly in 2011 to 4.6 million units and industry observers expect that home sales will increase to 4.9 million units in 2012 and to 5.3 million units in 2013 – well below 2004-2006 levels.

During 2009 and early 2010, special homebuyers tax credits were available for first-time and repeat homebuyers. Mortgages to first-time homebuyers tend to be more likely to qualify for housing goals than those for repeat homebuyers, who tend to be older and have higher incomes. Many first-time homebuyers whose mortgages might otherwise have been available to receive goal-qualifying loans for home purchases in 2012-2014, instead bought their homes in 2009 or 2010 to take advantage of the first-time homebuyers tax credit.

FHA Market Share. The composition of the affordable conventional mortgage market is also influenced by FHA's market share. FHA loans generally are pooled into mortgage-backed securities (MBS) guaranteed by the Government National Mortgage Association (GNMA). Enterprise purchases of mortgages insured by FHA and mortgages guaranteed by VA generally do not receive housing goals credit. As a result, a higher FHA share of the market generally results in a smaller proportion of affordable loans among loans that can be counted for purposes of the housing goals. FHA's share of the market rose significantly during 2008 through 2010, reaching a share of the home purchase mortgage market of nearly 40 percent in 2010 before falling to 30 percent in 2011, as measured by HMDA data.

Refinance Rate. The size of the refinance mortgage market has an impact on the affordable share of refinance mortgages. Historically, refinance mortgage volume increases when the refinancing of mortgages is motivated by low interest rates, "rate-and-term refinances," and

this increased volume is dominated by higher income borrowers. As a result, in periods of low interest rates the share of lower income borrowers will decrease. Likewise, refinancings that occurred when interest rates were high tended to have a higher proportion of lower income homeowners who were consolidating their debts or who were drawing equity out of their homes for other uses, while higher income homeowners dropped out of the refinance mortgage market.

In the current economic environment, lower income homeowners tend to have less equity—or negative equity—in their homes because the prices of lower-valued homes have fallen more than the prices of higher-valued homes.⁸ At the same time, lenders have tightened underwriting requirements, requiring higher down payments and higher credit scores. As a result, fewer lower-income homeowners may be able to refinance in 2012 and 2013. In addition, programs established in the wake of the financial crisis have affected refinancings. The Home Affordable Refinance Program (HARP), which became effective in March 2009, is an effort by the Enterprises to enhance the opportunity for owners to refinance. Homeowners whose mortgages are owned or guaranteed by Fannie Mae or Freddie Mae and who are current on their mortgages have the opportunity to reduce their monthly mortgage payments to take advantage of historically low mortgage interest rates. An essential element of this program is the permission to carry forward into the new loan any existing mortgage insurance from prior mortgages or, if no mortgage insurance existed, none would be required for the refinanced mortgage. Even under favorable interest rate conditions, however, refinancings may not mirror previous years.

Manufactured Housing Loans. Manufactured housing is an important source for affordable housing. Loans used to purchase a manufactured housing unit can be placed in two different categories. In the first category, the manufactured housing unit and the land where it

⁸ See The Joint Center for Housing Studies of Harvard University, “The State of the Nation’s Housing, 2011,” 40 (2010) (Table A-8), available at <http://www.jchs.harvard.edu/publications/markets/son2011/son2011.pdf>.

sits is considered real estate and a mortgage is used to acquire it. In the second category, the manufactured housing unit is considered personal property, or chattel, and the loan used to acquire it is called a chattel loan. Because it is a personal property loan, chattel loans generally have higher contract interest rates and terms than a mortgage loan would have. By definition, to be eligible to count toward a housing goal a mortgage must be on real estate, therefore chattel loans do not count.⁹ The mortgage data used in the models described in Section E below include chattel loans and therefore an adjustment is made to the market estimates. This adjustment is described in Section F.

⁹ 12 CFR 1282.1, and “2010–2011 Enterprise Housing Goals; Enterprise Book-entry Procedures; Final Rule.” Federal Register. (September 14, 2010), p. 55894.

C. ECONOMIC AND MORTGAGE MARKET DATA

Historical monthly time series data used in the housing goals models were obtained from a variety of sources. Gross Domestic Product, the unemployment rate, inflation rates, median prices for new homes, housing starts and new housing sales are from the Census Bureau, the Bureau of Economic Analysis and the Bureau of Labor Statistics.¹⁰ Constant maturity interest rates on Government notes and bonds came from the U.S. Department of the Treasury, while mortgage interest rates are provided by Freddie Mac's Primary Mortgage Market Survey. Median house prices for existing homes and the Housing Affordability Index were obtained from the National Association of Realtors (NAR), and FHFA produced the House Price Index. For 2009 and previous years the refinance rate and FHA market share were calculated from Home Mortgage Disclosure Act (HMDA) data. Preliminary refinance rates for 2012 are as reported by the Mortgage Bankers Association. Preliminary FHA market shares are calculated from home sales and FHA endorsement volume as reported monthly by FHA. For the list of data sources, see the Appendix.

FHFA measures the market performance for the single-family owner-occupied property mortgage housing goals by analyzing HMDA data.¹¹ HMDA data are loan level records of mortgage applications, originations and acquisitions that occurred during a calendar year and are considered to be broadly representative of the mortgage market in the United States.¹² The Federal Financial Institutions Examination Council has made available a monthly nationwide

¹⁰ U.S. Department of Commerce and the U.S. Department of Labor.

¹¹ HMDA data are made available from the Federal Financial Institutions Examination Council, <http://www.ffiec.gov/hmda/default.htm>.

¹² Avery, Robert B., et al. "The Mortgage Market in 2011: Highlights from the Data Reported under the Home Mortgage Disclosure Act." *Federal Reserve Bulletin*, (forthcoming), p. 1. The 2011 HMDA data covered 7,600 home lenders including the nation's largest mortgage originators.

time series from the loan level HMDA records with various attributes and specifications, including the performance of the four single-family housing goals and the one subgoal. For the purposes of estimating the single-family mortgage market for goal qualifying loans, FHFA defines the market as conventional conforming prime home purchase (refinance) mortgages.¹³

One of the issues with regard to HMDA data is the considerable delay in releasing the database. At this time the most current publicly available HMDA data are for 2011. To inform the forecasted estimates with more current information FHFA uses two supplemental data time series. For the three home purchase goals and subgoal an estimate of goal qualifying shares are calculated from FHFA's Monthly Interest Rate Survey (MIRS) data through May 2012, which are produced from a statistical model developed by Freddie Mac. The refinance goal time series is also extended using the combined Enterprise goal performance through July 2012. This is discussed in more detail in the methodology section(s).

Figures 1 through 4 show both the HMDA and the alternative time series for the four single-family housing goals and illustrate the seasonal characteristics of each series. The low-income (LIP) and very low-income (VLIP) borrower home purchase series are characterized by significant seasonality prior to 2000 and a dip in share during the subprime bubble from 2004 to 2006 (see Figures 1 and 2). The low-income areas home purchase subgoal (LAP) shares exhibit seasonality throughout the entire 16 year analysis period. Also, as can be seen in Figure 3, the series shifts up nearly four percent between 2002 and 2003 due to transitioning to the 2000 Census as the source for determining income and minority composition of the census tracts.

¹³ To be consistent with the conforming loan limits established in the American Recovery and Reinvestment Act (ARRA 2009), the conforming loan limit is defined as 1.15 times the Area Median House Price (from NAR), where the maximum (ceiling) must not exceed 1.75 times the original conforming limit for the given year. A loan is considered subprime if the lender is included in [HUD's subprime lender list](#). The market estimates are based on originations of first- and second-lien mortgages.

Figure 1
Low-Income Borrower Home Purchase Goal

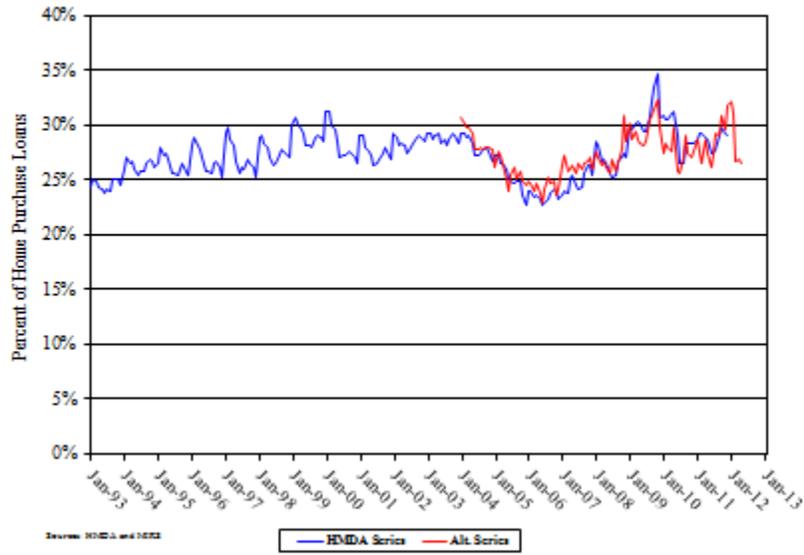


Figure 2
Very Low-Income Borrower Home Purchase Goal

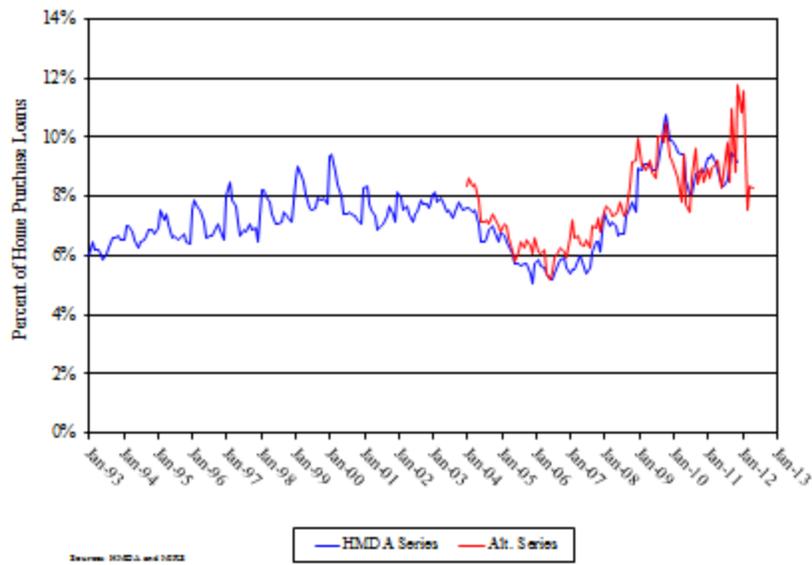


Figure 3
Low-Income Area Home Purchase Subgoal

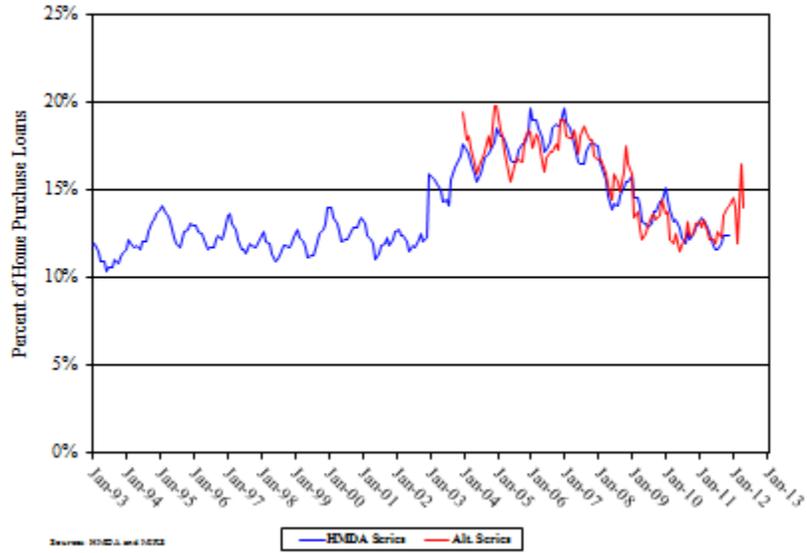
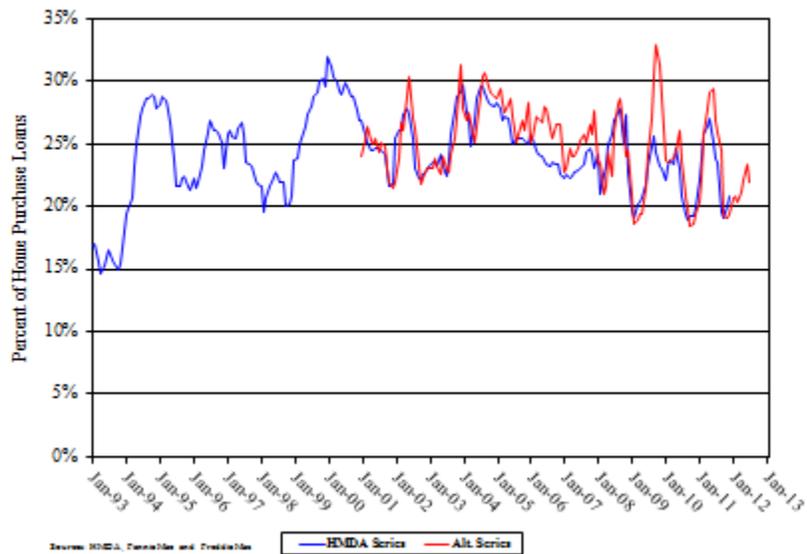


Figure 4
Low-Income Borrower Refinance Goal



While not as evident as the home purchase goals, the low-income borrower refinance goal (LIR) series is characterized by seasonality prior to 2000. The dominant feature, however is the large swings in low-income mortgage shares coinciding with refinance booms (see Figure 4). Figures 1 through 4 also show the correlation between the HMDA series and the alternative series.

D. MARKET FORECAST

FHFA compiled forecasts from twelve industry and government sources (industry observers). The list of forecasters, along with each forecasters' annualized projections for 2012 and 2013 of the market indicators are provided in **Tables 2 and 3**. The forecasts are all provided on either a quarterly or annual basis for each market indicator.

A summary (including forecast averages) of these key market indicators, on a quarterly basis, is provided in **Tables 4 and 5**, where the shaded area represents forecasts. On average, industry forecasters project the economy to continue to grow in 2012 and 2013, with real Gross Domestic Product (GDP) growing at rates of 2.2 and 2.1 percent, respectively. The industry observers expect the unemployment rate to remain just above 8.0 percent in 2012, and falling to 7.8 percent in the fourth quarter of 2013. For the 2012 and 2013 period, the forecasts polled by FHFA show that all interest rates are expected to rise, including the interest rate on a 30-year fixed rate mortgage, however, remaining below 4.0 percent through 2012 and 2013.

In addition to the expected moderate rebound in home sales, housing starts are expected to rise in 2012 and 2013. Single-family originations are expected to stay flat or perhaps even fall through this period. As discussed previously, expectations are that home values will rebound modestly in late 2012 through 2013, as evidenced in forecasts of the FHFA and Case-Shiller Home Price Indices. Generally affordability of housing, as measured by NAR's Housing Affordability Index, is expected to fall throughout 2012. Median sales prices of homes are expected to remain relatively flat over in 2012 and 2013.

Table 2
Forecasts of Economic Indicators by Source

	Real GDP Growth Rate		Residential Constr. Growth Rate		Inflation Rate (CPI) ²		Inflation Rate (Core CPI) ²		Inflation Rate (Core PCE) ²		Unemployment Rate		10-Year Const. Mat. Treas. Yield		1-Year Const. Mat. Treas. Yield		Prime Rate		Federal Funds Rate		
	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	
Forecast¹																					
Mortgage Bankers Association³	2.2%	1.9%	10.8%	9.3%	2.8%	2.1%	2.8%	2.1%	2.8%	2.1%	8.2%	8.0%	1.8%	1.8%	0.2%	0.2%	3.3%	3.3%	0.2%	0.2%	
Fannie Mae⁴	2.2%	2.0%	10.9%	9.4%	2.6%	2.1%	2.4%	2.1%	2.6%	2.1%	8.2%	7.9%	1.8%	1.8%	0.2%	0.2%	3.3%	3.3%	0.2%	0.2%	
Freddie Mac⁵	2.3%	2.6%			2.6%	2.0%					8.2%	7.9%	1.8%	2.0%	0.2%	0.3%					
National Association of Realtors⁶	2.4%	2.6%																			
Wells Fargo⁷	2.2%	1.8%	11.6%	13.2%	1.7%	2.4%	2.1%	1.9%			8.2%	8.2%	1.8%	1.8%	0.2%	0.2%	3.3%	3.3%	0.2%	0.3%	
PNC Financial⁸	2.3%	2.2%	11.5%	7.8%	2.8%	2.4%			1.8%	2.0%	8.2%	7.8%	1.8%	1.9%			3.3%	3.3%	0.1%	0.2%	
Standard and Poor's⁹	2.2%	1.7%	10.9%	10.7%	2.4%	1.4%	2.2%	1.8%			8.2%	8.0%	1.8%	2.1%					0.1%	0.1%	
National Association of Home Builders¹⁰	2.2%	2.1%											1.8%	2.2%	0.2%	0.3%	3.2%	3.3%	0.1%	0.1%	
The Conference Board¹¹	2.2%	2.1%																			
Wall Street Journal Survey¹²	2.3%	2.2%			2.6%	2.2%					8.2%	7.8%	1.9%	2.3%					0.1%	0.2%	
Federal Open Market Committee¹³	2.2%	2.4%							1.8%	1.9%	8.1%	7.8%									
Raymond James Financial¹⁴	2.3%	2.1%	12.1%	8.7%	2.6%	1.9%	2.1%	1.9%	1.8%	1.8%	8.2%	7.8%	1.8%	1.8%					0.1%	0.2%	
Philadelphia FRB Survey¹⁵	2.2%	2.0%	11.2%	9.8%	2.5%	2.2%	2.0%	1.9%	1.8%	2.1%	8.2%	7.9%	1.8%	2.1%							
Average¹⁶	2.2%	2.1%	11.3%	9.8%	2.5%	2.1%	2.1%	1.9%	1.8%	1.9%	8.2%	7.9%	1.8%	2.0%	0.2%	0.3%	3.2%	3.3%	0.2%	0.2%	
Minimum	2.2%	1.7%	10.8%	7.8%	1.7%	1.4%	2.1%	1.8%	1.8%	1.9%	8.1%	7.8%	1.8%	1.8%	0.2%	0.2%	3.2%	3.3%	0.1%	0.1%	
Maximum	2.4%	2.6%	11.6%	13.2%	2.8%	2.4%	2.4%	2.1%	1.8%	2.0%	8.2%	8.2%	1.9%	2.3%	0.2%	0.3%	3.3%	3.3%	0.2%	0.3%	

¹ Forecasts are annual averages of quarterly forecasts, where applicable.

² Fourth Quarter over Fourth Quarter Percent Change.

³ Last Updated 9/18/2012

⁴ Last Updated 9/10/2012

⁵ Last Updated 9/10/2012

⁶ Last Updated 8/29/2012

⁷ Last Updated 9/12/2012 . U.S. Economic Forecast and 9/17/2012 . U.S. Housing Market Forecast.

⁸ Last Updated 9/19/2012

⁹ Last Updated 9/21/2012

¹⁰ Last Updated 9/4/2012

¹¹ Last Updated 9/12/2012

¹² Last Updated 9/10/2012 . survey of 57 forecasters.

¹³ Last Updated 9/13/2012 . midpoint of the central tendency projection.

¹⁴ Last Updated 9/18/2012

¹⁵ Last Updated 8/10/2012 . survey of 45 forecasters.

¹⁶ 2011 averages include actual values for months when available. Therefore the average line may not equal the average of the above numbers.

Table 3
Forecasts of Housing and Mortgage Market Indicators by Source

	Housing Starts ²		Housing Starts (1-Unit) ²		Total Home Sales ²		New Home Sales ²		Existing Home Sales ²		Single-Family Originations ³		Refinance Mortgage Rate		ARM Market Share		
	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	
Forecast¹																	
Mortgage Bankers Association	756	873	514	589	4,940	5,210	365	404	4,576	4,806	\$1,466	\$1,043	71.9%	39.0%	5.3%	6.8%	
Fannie Mae	746	888	516	611	4,960	5,153	368	434	4,593	4,719	\$1,518	\$1,218	70.5%	54.7%	5.0%	6.8%	
National Association of Realtors	743	905			4,935	5,250					\$1,615	\$1,300	72.7%	61.3%	9.0%	13.5%	
Freddie Mac	775	1,150			4,985	5,608											
Wells Fargo	743	845	520	600	4,920	5,200	370	430	4,550	4,770							
PNC Financial	752	835					366	402									
Standard and Poor's	760	940					375	504									
National Association of Home Builders	751	903	528	665													
The Conference Board	760	880															
Wall Street Journal Survey	750	900															
Federal Open Market Committee	748	840															
Philadelphia FRB Survey																	
Average⁴	748	906	517	616	4,938	5,285	370	464	4,590	4,824	\$1,533	\$1,187	71.7%	51.6%	5.9%	9.0%	
Minimum	743	835	514	589	4,920	5,153	365	402	4,550	4,719	\$1,466	\$1,043	70.5%	39.0%	5.0%	6.8%	
Maximum	775	1,150	528	665	4,985	5,608	385	608	4,600	5,000	\$1,615	\$1,300	72.7%	61.3%	9.0%	13.5%	
Forecast¹																	
Mortgage Bankers Association	3.8%	4.1%			1.0%	3.3%	1.1%	1.0%	-0.9%	0.5%	\$230	\$235	\$171	\$176			
Fannie Mae	3.7%	3.7%	2.7%	2.7%							\$229	\$230	\$169	\$170			
Freddie Mac	3.8%	4.0%	2.8%	3.0%													
Wells Fargo	3.8%	4.1%															
Wells Fargo	3.7%	3.6%	2.8%	3.0%			1.2%	1.8%	1.2%	1.7%	\$232	\$237	\$174	\$183			
PNC Financial	3.7%	3.4%							4.2%	2.5%							
Standard and Poor's	3.7%	3.5%															
National Association of Home Builders	3.7%	4.0%	2.8%	3.0%													
The Conference Board																	
Wall Street Journal Survey																	
Philadelphia FRB Survey																	
Average⁴	3.7%	3.8%	2.8%	2.9%	0.2%	3.2%	1.2%	1.4%	1.5%	1.6%	\$230	\$234	\$174	\$176	29.2%	23.1%	
Minimum	3.7%	3.4%	2.7%	2.7%	-0.5%	3.1%	1.1%	1.0%	-0.9%	0.5%	\$229	\$230	\$169	\$170	28.3%	23.1%	
Maximum	3.8%	4.1%	2.8%	3.0%	1.0%	3.3%	1.2%	1.8%	1.2%	1.8%	\$232	\$237	\$174	\$183	28.3%	23.1%	

¹ Forecasts are annual averages of quarterly forecasts, where applicable. See Table 2 for update information. The FOMC and Raymond James & Associates only provide forecasts on basic macroeconomic series and therefore are omitted from the mortgage/housing forecast table (see Table 2).

² Thousands of units

³ Billions of dollars

⁴ 2011 averages include actual values for months when available. Therefore the average line may not equal the average of the above numbers.

⁵ Federal Housing Finance Agency: All transactions and home purchase only; home price indices: (Q4:Q4 % Change).

⁶ Standard & Poor's / Case-Shiller Home Price Index, 10-City Composite (Q4:Q4 % Change).

⁷ Thousands of dollars

Table 5
Economic and Mortgage Market Outlook

	2010				2011				2012				2013			
	Q1	Q2	Q3	Q4												
Housing Starts ¹	618	602	580	542	586	572	614	678	715	735	751	792	864	895	921	942
Housing Starts, 1-Unit ¹	526	489	430	440	419	422	424	473	488	516	525	540	591	603	623	648
Total Home Sales ²	4,769	5,070	3,852	4,345	4,639	4,484	4,545	4,693	4,918	4,901	4,919	5,016	5,214	5,258	5,306	5,359
New Home Sales ¹	359	335	291	300	295	308	298	327	352	363	380	386	451	457	466	480
Existing Home Sales ¹	4,411	4,735	3,561	4,044	4,344	4,176	4,246	4,366	4,566	4,538	4,625	4,632	4,789	4,812	4,836	4,860
Single-Family Originations ³	\$342	\$367	\$401	\$462	\$302	\$290	\$309	\$361	\$363	\$372	\$446	\$352	\$303	\$322	\$300	\$262
Refinance Mortgage Share ⁴	63%	49%	70%	77%	69%	52%	60%	78%	75%	74%	72%	67%	62%	53%	48%	44%
FHA Home Purchase Market Share ⁵	36%	39%	33%	32%	31%	31%	29%	30%	36%	33%	26%	23%	23%	23%	23%	23%
ARM/Market Share	5%	5%	6%	5%	6%	7%	4%	4%	4%	5%	7%	8%	8%	9%	10%	10%
Investor Share	9%	9%	9%	8%	11%	12%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
30-Year Mortgage Fixed Rate ⁶	5.0%	4.9%	4.5%	4.4%	4.9%	4.7%	4.3%	4.0%	3.9%	3.8%	3.6%	3.6%	3.7%	3.8%	3.8%	3.9%
1-Year ARM Rate ⁶	4.3%	4.0%	3.6%	3.3%	3.3%	3.1%	2.9%	2.9%	2.8%	2.8%	2.7%	2.8%	2.9%	2.9%	2.9%	2.9%
Change in Housing Prices (FHFA ALL) ⁷	-6.6%	-5.0%	-1.5%	-1.6%	-3.2%	-3.9%	-4.0%	-2.9%	-1.4%	-0.6%	-0.4%	0.2%	1.6%	2.7%	2.9%	3.2%
Change in Housing Prices (FHFA PO) ⁸	-2.8%	-1.6%	-2.8%	-4.0%	-5.4%	-5.5%	-3.4%	-2.3%	0.5%	3.5%	0.9%	1.2%	1.1%	0.6%	1.4%	1.4%
Change in Housing Prices (CS HPI) ⁹	1.5%	5.0%	2.6%	-0.6%	-2.8%	-3.7%	-3.5%	-3.8%	-3.6%	-1.0%	0.4%	1.5%	2.4%	1.0%	1.1%	1.6%
Housing Affordability Index ¹⁰	168	171	179	178	178	182	189	195	196	198	200	196	197	197	196	192
Median Sales Price - New Homes ¹¹	\$222	\$220	\$222	\$222	\$227	\$229	\$222	\$219	\$234	\$234	\$227	\$225	\$234	\$235	\$233	\$233
Median Sales Price - Existing Homes ¹¹	\$166	\$177	\$177	\$170	\$158	\$169	\$169	\$162	\$158	\$181	\$183	\$172	\$173	\$179	\$177	\$176

Note: Shaded area indicates forecasted values. Forecasts are an average forecast of Mortgage Bankers Association (MBA), Fannie Mae, Freddie Mac, National Association of Realtors, Wells Fargo, PNC Financial, the National Association of Home Builders, Standard and Poor's, the Wall Street Journal Survey, the Conference Board, Raymond James Financial, the Federal Reserve Bank of Philadelphia and the Federal Open Market Committee.

¹ Thousands of units

² Thousands of units, forecasted amount does not equal the sum of the existing plus new home sales because differences in forecasts.

³ FHFA and MBA, Billions of dollars

⁴ The refinance shares for 2004-2009 are calculated from Home Mortgage Disclosure Act (HMDA) data. Preliminary estimates in 2010 are as reported by MBA.

⁵ The FHA market shares for 2008 are calculated from HMDA data. Preliminary estimates for 2009 are the FHA endorsements (FHA Outlook) share of home sales (Census Bureau), scaled to match the mortgage market FHA market share.

⁶ Freddie Mac, Primary Mortgage Market Survey

⁷ FHFA House Price Index, all transactions (Y/Y % Change)

⁸ FHFA House Price Index, purchase transactions only (Y/Y % Change, Seasonally Adjusted)

⁹ Standard & Poor's Case-Shiller 10 City Index (Y/Y % Change, Seasonally Adjusted)

¹⁰ Freddie Mac's Conventional Mortgage Home Price Index (Y/Y % Change, Annual Rate)

¹¹ National Association of Realtors

¹² Thousands of dollars

The refinance share of the market, as measured by the Mortgage Bankers Association, averaged 68 percent in 2011, although it finished the year at 78 percent.. The share of the market that is made up by refinance loans is expected to slowly decrease to 44 percent by the fourth quarter of 2013.

FHFA's estimates of the market performance for the two single-family owner-occupied home purchase housing goals and one subgoal, and the refinancing mortgage housing goal, are provided at the top of **Table 4**. FHFA estimates that the low-income borrower shares of the home purchase mortgage market will be 27.0 percent in 2012 and 26.3 percent in 2013. FHFA estimates that the very low-income borrower shares of the home purchase mortgage market will be 8.3 percent and 8.2 percent, respectively, in 2012 and 2013. The estimates for the share of goal-qualifying mortgages in low-income areas in the home purchase mortgage market, excluding designated disaster areas, are 11.8 percent of home purchase mortgages in 2012 and 11.9 percent in 2013. FHFA estimates that 19.9 percent of refinance mortgages will be made to low-income borrowers in 2012 and 22.6 percent in 2013.

To arrive at these estimates, FHFA used an econometric state space methodology to extend the trends of the market performance for each goal, based on a monthly time series database provided by the Federal Financial Institutions Examination Council (FFIEC) and the Federal Reserve Board. For the low-income areas goal, this model produced only the market estimates for the subgoal. The remainder of the market estimates for this goal relates to the designated disaster areas. The 2012 and 2013 estimates of the share of home purchase mortgages that will qualify for the designated disaster areas portion of the low-income areas goal will be provided in January of each year.

FHFA used all relevant information when determining the benchmark levels for the 2012 through 2014 housing goals. While the tightening of underwriting standards is not included in the market estimates calculation, it was considered in the determination of the benchmark levels. FHFA attempts to use the most current data possible when estimating market size, including information from the Monthly Interest Rate Survey (MIRS) and Enterprise refinance mortgage acquisitions to extend HMDA goal performance data.

E. STATISTICAL MODELS OF THE SINGLE-FAMILY HOUSING GOALS

As stated previously, one of the issues with HMDA data is its age. Currently the most recent year for which HMDA data are available is 2011. There exists more recent data that can be used to inform our forecasts, which only lags by one to four months.

To estimate the 2012 and 2013 affordability market size for the four single-family housing goals, FHFA implemented a state space form (SSF) with the associated algorithms of the Kalman filter and smoother.¹⁴ This SSF approach is a method by which we can statistically fill in the time series gap left by HMDA data with a similar time series which is highly correlated with it. In our case we use an estimate of monthly market affordability levels for the home purchase goals from MIRS data, an estimated time series of goal-qualifying shares provided by Freddie Mac that are based on MIRS data from 2004 through August of 2011. We also estimate the market size of the refinance goal using the SSF approach based on the combined Fannie Mae and Freddie Mac goal shares for January 2002 – September 2011. **Figures 1 through 4** show for each housing goal how the alternative data series correlates with the HMDA series.

Several specifications of the ARIMA model were tested for each housing goal. All of the time series, both the dependent (goal qualifying share) and independent (explanatory), were found to be stationary when integrated at the first level.¹⁵ While several exogenous variables had the expected sign, many were found to be insignificant at a 10 percent level of confidence. The best fitting estimation equations for each of the goals are described below.

¹⁴ The methodology followed is an adaptation of a state space model developed by Freddie Mac, Housing Analysis and Research. For a thorough discussion of the state space approach see Harvey, Andrew. “Forecasting with Unobserved Components Time Series Models,” in Handbook of Economic Forecasting. G. Elliott, C.W.J. Granger and A. Timmermann eds. North Holland, 2006, pp. 327-412.

¹⁵ In simple terms, a stationary time series has no trend, has a constant variance over time, has a constant autocorrelation structure and has no periodic fluctuations (seasonality).

Some of the equations were fitted with monthly binary variables to capture seasonality effects. In addition, it was found that a seasonal moving average term was required in each of the four housing goal models.

Low-Income Borrower Income Home Purchase Goal. The ARIMA model estimation results for the Low-Income Borrower Income Home Purchase Goal (LIP) are presented in **Table 6**. As indicated in Figure 1 above, there is a strong seasonal effect prior to 2000. The model in Table 5 accounts for this with a set of 11 monthly binary variables, *JAN2000* to *NOV2000*, (the December effect is captured in the constant) for the years 1993 to 1999 and equals zero in 2000 and after. Also, a binary variable, *DUM2000*, that is equal to 1 prior to 2000 and 0 otherwise is added to account for any shift in the time series. The best fitting equation was found to be a first differenced seasonal ARIMA model with autoregressive terms at lags of 2, *AR(2)*, 4, *AR(4)*, and 5 months, *AR(5)*, and a seasonal moving average term at 12 months, *MA(12)*. In addition to the time series components, drivers of this housing goal include the rate of core inflation, $\ln(CORE_CPI)$, the unemployment rate lagged one month, $UNEMP_{t-1}$, the yield on a 10-year Treasury Note, *TREAS_10*, the spread between the 10-year Treasury Note rate and the 30-year Fixed Mortgage rate, *SPREAD_T10_F30*, the log of mortgage originations, $\ln(ORIG)$, and the trend in house prices, as measured by monthly change, $\ln(HPI)$, and the year-over-year change, $\ln(HPI_{12})$. The Chi-Square statistic indicates that we cannot reject the hypothesis that the residuals are white noise, implying that the residuals have a random distribution.

Table 6

Low-Income Borrower Home Purchase Goal

Variable	Parameter Estimates	t-stat
MA(12)	-0.4215	(-5.42) ***
AR(2)	-0.2398	(-3.16) ***
AR(4)	-0.1701	(-2.18) **
AR(5)	-0.1250	(-1.66) *
ln(CORE_CPI)	0.8438	(2.41) **
UNEMP _{t-1}	0.9430	(3.37) ***
TREAS_10	-0.5920	(-2.45) **
SPREAD_T10_F30	-1.1100	(-2.26) **
ln(ORIG)	-0.0069	(-1.94) *
ln(HPI)	0.2863	(2.32) **
ln(HPI ₁₂)	-0.0305	(-2.35) **
JAN2000	0.0266	(5.38) ***
FEB2000	0.0019	(0.40)
MAR2000	-0.0040	(-0.86)
APR2000	-0.0066	(-1.47)
MAY2000	-0.0070	(-1.56)
JUN2000	-0.0070	(-1.57)
JUL2000	-0.0009	(-0.20)
AUG2000	-0.0005	(-0.11)
SEP2000	0.0093	(2.03) **
OCT2000	-0.0050	(-1.10)
NOV2000	-0.0031	(-0.69)
DUM2000	-0.0017	(-2.08) **

$$\sigma^2 = 0.000044454$$

$$\chi^2 = 0.36$$

$$\text{Prob}(\chi^2) = 0.834$$

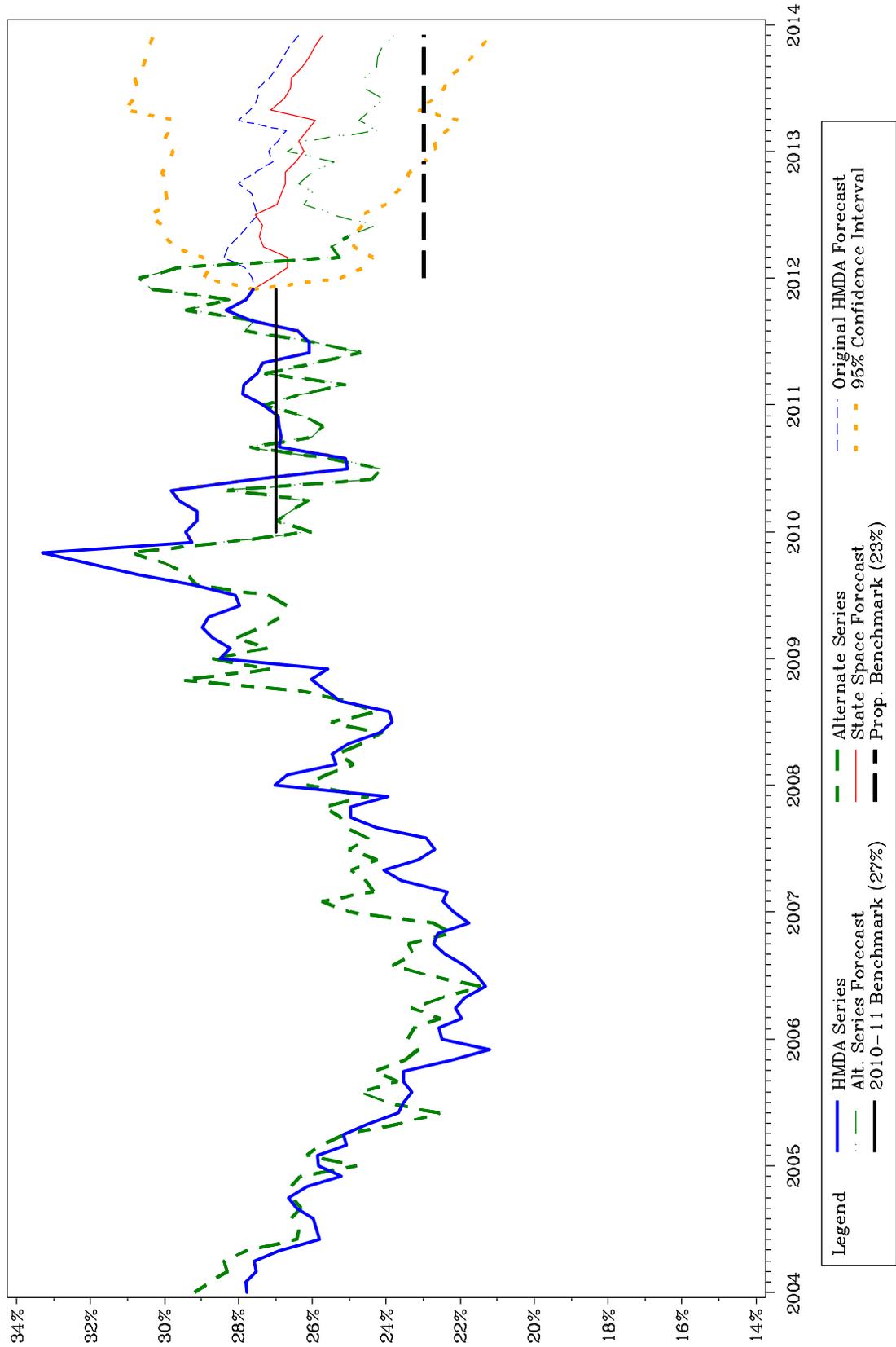
* Significant at 10 percent level.

** Significant at 5 percent level.

*** Significant at 1 percent level.

The forecasts for the LIP goal is shown in Figure 5. While FHFA has determined that the state space form provided the best forecast, the forecasts based on HMDA data alone and a where the HMDA time series is merely amended with the alternative time series are shown in Figure 5. Also, for reference, the figure is annotated with the 2010-2011 goal benchmark (27 percent) and the proposed benchmark (23 percent).

Figure 5
Low-Income Borrower Home Purchase Goal



Very Low-Income Borrower Income Home Purchase Goal. The model estimation results for the Very Low-Income Borrower Income Home Purchase Goal (VLIP) are presented in Table 7. As with the Low-Income Borrower Goal there is a strong seasonal effect prior to 2000 (see Figure 2). The model in Table 6 also accounts for this with a set of 11 monthly binary variables, *JAN-2000* to *NOV-2000*, (the December effect is captured in the constant) for the years 1993 to 1999 and a binary variable, *DUM2000*, that is equal to 1 prior to 2000 and 0 otherwise.

The best fitting equation was found to be a first differenced seasonal ARIMA model with autoregressive terms at lags of 2, *AR(2)*, and 5 months, *AR(5)*, and a seasonal moving average term at 12 months, *MA(12)*. In addition to the time series components, drivers of this housing goal include the rate of core inflation, $\ln(CORE_CPI)$, the unemployment rate lagged one month, $UNEMP_{t-1}$, the yield on a 10-year Treasury Note, *TREAS_10*, the spread between the 10-year Treasury Note rate and the 30-year Fixed Mortgage rate, *SPREAD_T10_F30*, the log of mortgage originations, $\ln(ORIG)$, and the trend in house prices lagged 2 months, as measured by monthly change, $\ln(HPI)_{t-2}$. The Chi-Square statistic indicates that we cannot reject the hypothesis that the residuals are white noise.

The forecast for the VLIP goal is shown in Figure 6. While FHFA has determined that the state space form provided the best forecast, the forecasts based on HMDA data alone and where the HMDA time series is merely amended with the alternative time series are shown in Figure 6. Also, for reference, the figure is annotated with the 2010-2011 goal benchmark (8 percent) and the proposed benchmark (7 percent).

Table 7

Very Low-Income Borrower Home Purchase Goal

Variable	Parameter Estimates	t-stat
MA(12)	-0.4518	(-5.74) ***
AR(2)	-0.1266	(-1.65) *
AR(5)	-0.1295	(-1.67) *
ln(CORE_CPI)	0.4117	(2.85) ***
UNEMP _{t-1}	0.3172	(2.70) ***
TREAS_10	-0.3150	(-3.10) ***
SPREAD_T10_F30	-0.5154	(-2.51) **
ln(ORIG)	-0.0030	(-2.03) **
ln(HPI) _{t-2}	-0.0815	(-2.15) **
JAN2000	0.0108	(5.11) ***
FEB2000	0.0019	(0.99)
MAR2000	-0.0024	(-1.23)
APR2000	-0.0011	(-0.60)
MAY2000	-0.0038	(-2.06) **
JUN2000	-0.0028	(-1.49)
JUL2000	-0.0005	(-0.28)
AUG2000	0.0007	(0.39)
SEP2000	0.0027	(1.39)
OCT2000	-0.0021	(-1.09)
NOV2000	-0.0004	(-0.24)
DUM2000	-0.0006	(-1.71) *

$$\sigma^2 = 0.000007892$$

$$\chi^2 = 3.73$$

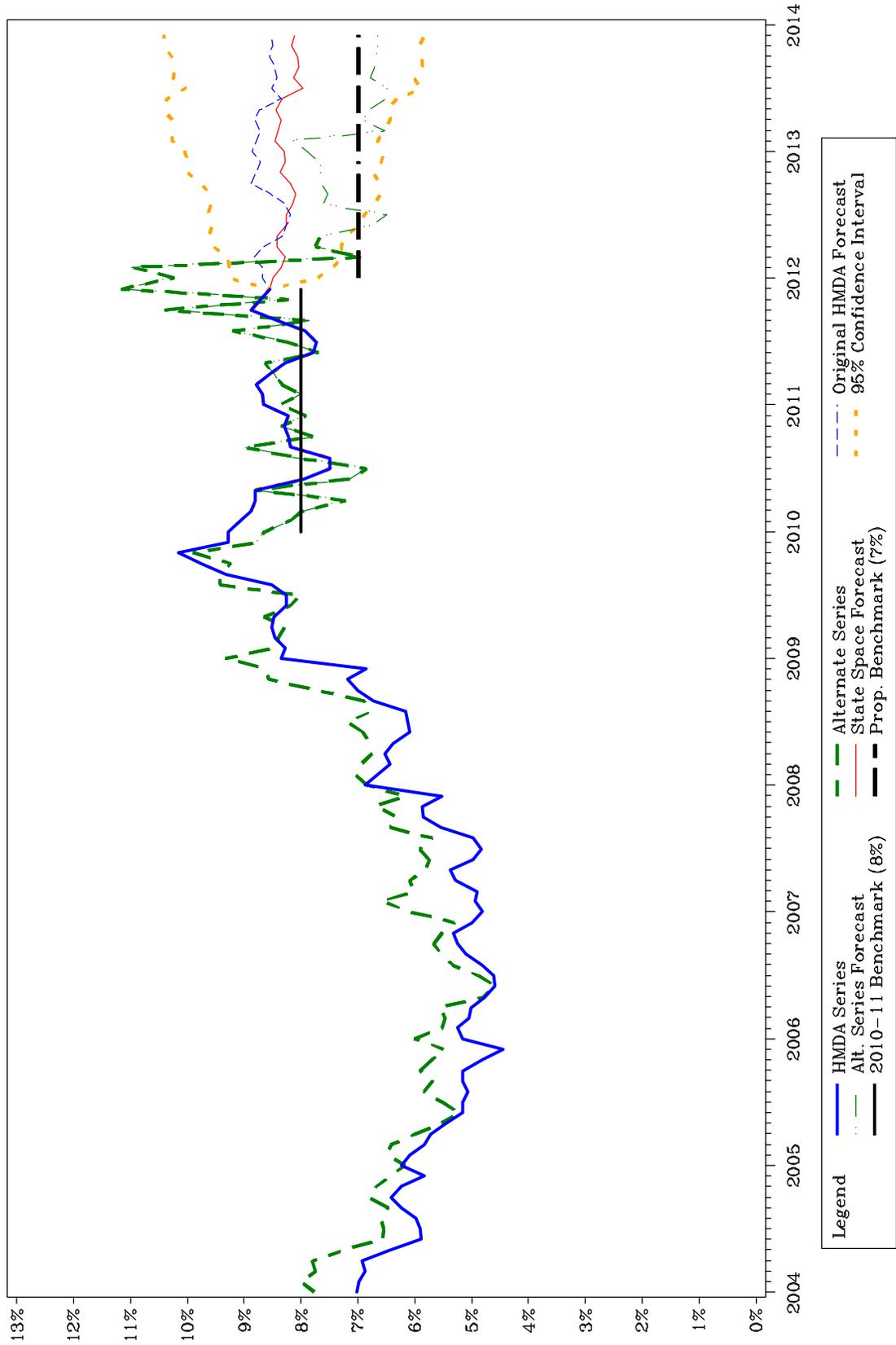
$$\text{Prob}(\chi^2) = 0.293$$

* Significant at 10 percent level.

** Significant at 5 percent level.

*** Significant at 1 percent level.

Figure 6
Very Low Income Borrower Home Purchase Goal



Low-Income Area Home Purchase Subgoal. The model estimation results for the Low-Income Area Home Purchase Subgoal (LAP) are presented in Table 8. As indicated in Figure 3, for the LAP goal, there is a strong seasonal effect throughout the estimation period, which is adequately accounted for by the $MA(12)$ term. In addition to the $MA(12)$ term, the best fitting equation for the LAP subgoal was found to be a first differenced seasonal ARIMA model. It includes a one month lagged moving average term, $MA(1)$, and two autoregressive terms lagged one month, $AR(1)$ and five months, $AR(5)$. Additionally, the drivers of this housing goal include investor share, $INVESTOR_SHR$, the unemployment rate lagged one month, $UNEMP_{t-1}$, the yield on a 10-year Treasury Note, $TREAS_10$, and the spread between the 10-year Treasury Note rate and the 30-year Fixed Mortgage rate, $SPREAD_T10_F30$. The Chi-Square statistic indicates that we cannot reject the hypothesis that the residuals are white noise.

The forecast for the LAP subgoal is shown in Figure 7. Upon consideration of the increased variability in the alternative data series, FHFA decided to base the 2012-2014 benchmark only on the original HMDA data forecast. Also, for reference, the figure is annotated with the 2010-2011 goal benchmark (13 percent) and the proposed benchmark (11 percent).

Table 8**Low-Income Area Home Purchase Subgoal**

Variable	Parameter Estimates	t-stat
MA(1)	0.2881	(2.39) **
MA(12)	-0.4170	(-5.91) ***
AR(1)	0.3367	(2.71) ***
AR(5)	-0.2413	(-3.52) ***
INVESTOR_SHR	0.0973	(1.78) *
UNEMP _{t-1}	-0.3279	(-1.83) *
TREAS_10	-0.3818	(-2.58) ***
SPREAD_T10_F30	-0.8188	(-2.83) ***

$$\sigma^2 = 0.00001803$$

$$\chi^2 = 3.77$$

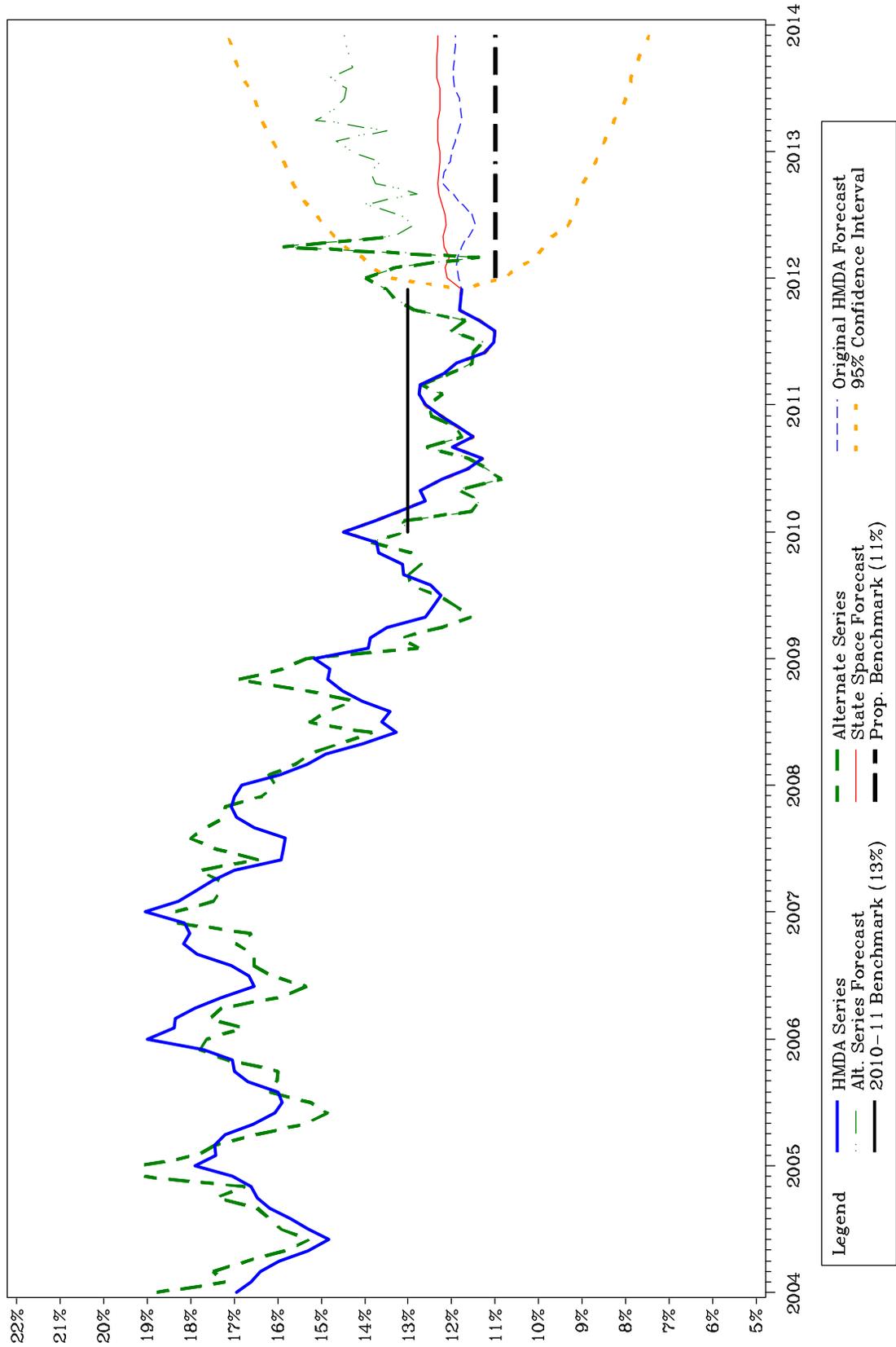
$$\text{Prob}(\chi^2) = 0.152$$

* Significant at 10 percent level.

** Significant at 5 percent level.

*** Significant at 1 percent level.

Figure 7
Low-Income Area Home Purchase Subgoal



Low-Income Borrower Income Refinance Goal. The best fitting equation for the Low-Income Borrower Income Refinance Goal (LIR), shown in Table 9, was found to be a first differenced seasonal ARIMA model. That is, it includes one 12 month seasonal moving average term, $MA(12)$, and one autoregressive term, $AR(1)$, lagged one month. Other drivers of this housing goal include the yield on a 10-year Treasury Note lagged one month, $TREAS_{10,t-1}$, the spread between the 10-year Treasury Note rate and the 30-year Fixed Mortgage rate, $SPREAD_{T10_F30}$, the share of mortgages that are refinance loans, $REFI_SHR$, the log of mortgage originations, $\ln(ORIG)$, and the trend in house prices, as measured by monthly change, $\ln(HPI)$. The Chi-Square statistic indicates that we cannot reject the hypothesis that the residuals are white noise.

Table 9

Low-Income Borrower Refinance Goal

Variable	Parameter Estimates	t-stat
MA(12)	-0.3043	(-3.90) ***
AR(1)	-0.2169	(-2.94) ***
TREAS_10 _{t-1}	1.3613	(4.57) ***
SPREAD_T10_F30	-1.3897	(-3.31) ***
REFI_SHR	-0.1243	(-7.86) ***
ln(ORIG)	-0.0137	(-3.04) ***
ln(HPI)	-0.1519	(-1.66) *
$\sigma^2 = 0.000057676$		
$\chi^2 = 1.65$		
Prob(χ^2) = 0.801		

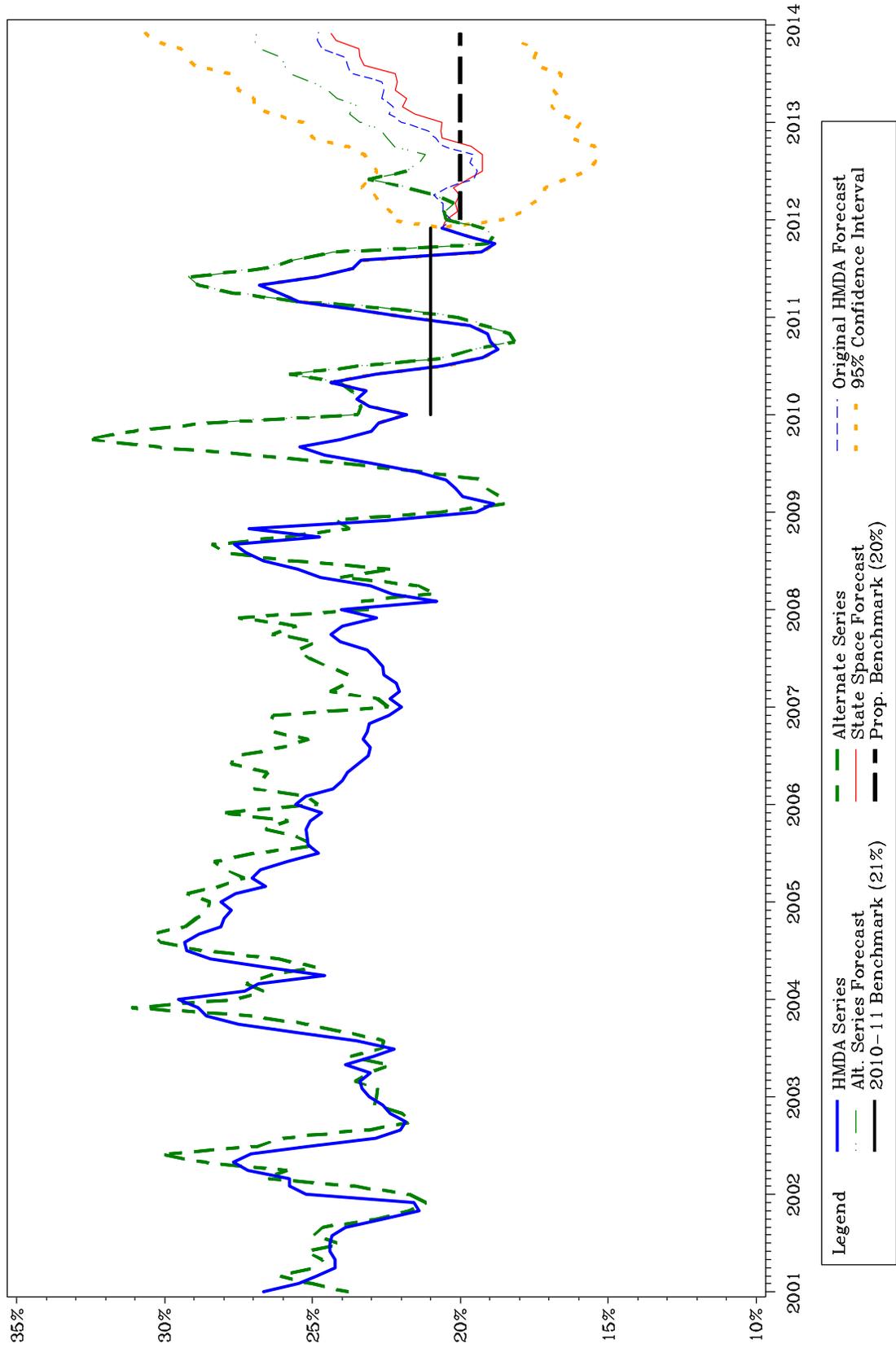
* Significant at 10 percent level.

** Significant at 5 percent level.

*** Significant at 1 percent level.

The forecast for the LIR goal is shown in Figure 8. While FHFA has determined that the state space form provided the best forecast, the forecasts based on HMDA data alone and a where the HMDA time series is merely amended with the alternative time series are shown in Figure 7. Also, for reference, the figure is annotated with the 2010-2011 goal benchmark (21 percent) and the proposed benchmark (20 percent).

Figure 8
Low-Income Borrower Refinance Goal



F. ADJUSTMENT FOR MANUFACTURED HOME LOANS

Beginning in 2004 mortgage originators are required to identify higher-cost and manufactured housing loans, but does not directly identify manufactured housing chattel loans. For the current housing goals, beginning in 2010, FHFA utilizes the identification of high-cost and manufactured housing loans to proxy for subprime loans and manufactured housing chattel loans when calculating the market's housing goal shares. During 2007 to 2011, 63.7 percent of manufactured housing loans were higher-cost, according to the HMDA data. Only 2.7 percent of manufactured housing loans, with most being refinance loans, were originated by subprime lenders.¹⁶ From this information, we infer that the majority of higher-cost manufactured housing loans were originated by non-subprime lenders, and we can safely assume that these higher-cost loans are chattel.

For the forecast models in Section E, we use a monthly time series that uses the subprime lender list to identify subprime loans. This is done so that we can use the longest time series from the HMDA data possible, back to 1996. Therefore, the potential manufactured housing chattel loans remain in the data. Table 10 shows the share of manufactured housing loans that are higher-cost and manufactured housing's incremental contribution to each of the housing goals for the years 2004 to 2010. To adjust the market estimates of the housing goals to account for the effect from chattel loans on manufactured housing, FHFA weighted the average 2008 to 2010 manufactured housing contribution to the goals market estimates by 80 percent for the home purchase mortgage goals and 40 percent for the refinance mortgage goal.

¹⁶ The Department of Housing and Urban Development, Subprime Lender List ([see http://www.huduser.org/portal/datasets/manu.html](http://www.huduser.org/portal/datasets/manu.html)).

Table 10**Manufactured Housing Loans**

	Home Purchase loans				Refinance Loans	
	Contribution to Goal:				Contribution	
	Percent Higher Cost	Very Low- Income Borrower	Low-Income Borrower	Low-Income Area	Percent Higher Cost	to Low-Income Borrower Goal
2004	55.0%	0.6%	1.6%	0.7%	44.7%	0.6%
2005	58.3%	0.5%	1.4%	0.6%	54.0%	0.6%
2006	50.5%	0.5%	1.3%	0.6%	52.6%	0.7%
2007	61.5%	0.6%	1.6%	0.7%	55.1%	0.7%
2008	75.4%	0.7%	1.7%	0.8%	62.2%	0.7%
2009	76.0%	0.7%	1.6%	0.6%	48.5%	0.4%
2010	80.0%	0.9%	2.2%	0.9%	33.9%	0.3%
2011	81.6%	0.9%	2.2%	1.0%	30.8%	0.4%
3-Year Ave.	79.2%	0.7%	1.8%	0.8%	39.0%	0.5%
Adjustment	80%	-0.6%	-1.4%	-0.6%	40%	-0.2%

Source: HMDA data.

This results in the market estimate for the Low-Income Borrower Home Purchase Housing Goal being adjusted by -1.4 percent, the Very Low-Income Borrower Home Purchase Housing Goal and the Low-Income Area Home Purchase Housing Subgoal by -0.6 percent, and the Low-Income Borrower Refinance Housing Goal by -0.2 percent. The projected market estimates in Tables 1 and 4 reflect these adjustments.

G. CONCLUSIONS

FHFA is required to consider market size when establishing housing goals. This paper describes the methodologies used to estimate market size of the four single-family housing goals for 2012 through 2014. The 2012-2014 market size estimates for the four housing goals are:

- Low-Income Borrower Home Purchase Goal 23 %
- Very Low-Income Borrower Home Purchase Goal 7 %
- Low-Income Area Home Purchase Subgoal 11 %
- Low-Income Borrower Refinance Goal 20 %

The market projections are based on econometric state space form time series models, incorporating industry and government economic, housing and mortgage market forecasts. The benchmarks are set such that they are expected to be feasible during then entire period of 2012 and 2013. Due to insufficient forecast date for 2014, FHFA was unable to extend the forecast of market affordability shares to that year, however we assume that affordability in 2014 will be similar to that of 2012 and 2013. These benchmarks are based on market estimates utilizing historical trend data through August 2012.

APPENDIX

Data Sources

Federal Financial Institutions Examination Council, Home Mortgage Disclosure Act Data

Low-Income Borrower Home Purchase Mortgage Share
Very Low-Income Borrower Home Purchase Mortgage Share
Low-Income Area Home Purchase Mortgage Share
Low-Income Borrower Refinance Mortgage Share
Refinance Mortgage Share, 1993 - 2009
FHA Home Purchase Mortgage Market Share, 1993 - 2009
Investor Share
<http://www.ffiec.gov/hmda/default.htm>

Federal Housing Finance Agency

House Price Index
<http://www.fhfa.gov/Default.aspx?page=14>

U.S Department of Commerce, Bureau of Economic Analysis

Gross Domestic Product
<http://www.bea.gov/national/index.htm#gdp>

U.S Department of Commerce, Census Bureau

Housing Starts
<http://www.census.gov/const/www/newresconstindex.html>

New Home Sales
Median and Sales Price of New One-Family Houses Sold
<http://www.census.gov/const/www/newressalesindex.html>

U.S Department of Labor, Bureau of Labor Statistics

Consumer Price Index
<http://www.bls.gov/cpi/data.htm>

Unemployment Rate
<http://www.bls.gov/cps/>

Federal Reserve Bank of St. Louis

Monthly average of the 10-Year Treasury Constant Maturity Rate
Monthly average of the 1-Year Treasury Constant Maturity Rate
<http://research.stlouisfed.org/fred2/categories/115>

Federal Housing Administration

FHA Endorsements

<http://www.hud.gov/offices/hsg/comp/rpts/ooe/olmenu.cfm>

Mortgage Bankers Association

Single-Family Originations

Refinance Mortgage Share, 2009

Forecast

<http://www.mbaa.org/ResearchandForecasts/EconomicOutlookandForecasts>

Freddie Mac

Monthly average of the 30-Year Fixed Rate Mortgage Rate

<http://www.freddiemac.com/pmms/pmms30.htm>

Forecast

<http://www.freddiemac.com/news/finance/>

Fannie Mae

Forecast

<http://www.fanniemae.com/media/economics/index.jhtml?p=Media&s=Economics+&+Mortgage+Market+Analysis>

National Association of Realtors

Monthly Housing Affordability Index

Existing-Home Sales

Median Sales Price - Existing-Homes

<http://www.realtor.org/research/research/ehspage>

Forecast

<http://www.realtor.org/research/research/reportsstatistics>

Wells Fargo

Forecast

<https://www.wachovia.com/foundation/v/index.jsp?vnextoid=957e10a2090aa110VgnVCM1000004b0d1872RCRD&vnextfmt=default>

PNC Financial

Forecast

<https://www.pnc.com/webapp/unsec/NCAboutMicrositeNav.do?siteArea=/pnccorp/PNC/Home/About+PNC/Media+Room/Economic+Reports>

National Association of Home Builders

Forecast

http://www.nahb.org/reference_list.aspx?sectionID=138

Standard and Poor's

Forecast

<http://www.standardandpoors.com/home/en/us/>

Wall Street Journal Survey

Forecast

<http://online.wsj.com/public/resources/documents/info-flash08.html?project=EFORECAST07>

The Conference Board

Forecast

<http://www.conference-board.org/data/chiefeconomist.cfm>

Federal Reserve Board of Governors, Federal Open Market Committee

Forecast

<http://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

Raymond James Financial

Forecast

<http://raymondjames.com/monit2.htm>

Federal Reserve Bank of Philadelphia

Community Outlook Survey

<http://www.philadelphiafed.org/community-development/community-outlook-survey/>

Forecast

<http://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/>