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An Economic Analysis of the Homebuyer Tax Credit

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Summary

There have been three different versions of the homebuyer tax credit enacted since the summer of 2008. In July 2008, Congress enacted a first-time homebuyer tax credit as part of the Housing and Economic Recovery Act of 2008 (HERA; P.L. 110-289). The tax credit was originally set to expire on July 1, 2009. The American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) increased the tax credit's value and extended its expiration date to December 1, 2009. The Worker, Homeownership, and Business Assistance Act of 2009 (WHBAA; P.L. 111-92) extended the tax credit through the first half of 2010 and expanded it to repeat homebuyers.

The changes enacted by P.L. 111-92 extended the tax credit to homebuyers who enter a written binding contract before May 1, 2010, and completed their purchase before July 1, 2010. These deadlines were extended by one year for members of the military and other individuals who serve on qualified official extended duty outside the United States for 90 days before May 1, 2010. The tax credit for repeat buyers was capped at $6,500 and was limited to those who have owned and lived in their current home for five of the last eight years. Other changes included an expansion of the maximum credit income eligibility limits to $125,000 for individuals and $225,000 for married couples, up from $75,000 and $150,000, respectively. Lastly, an $800,000 limit on the purchase price of a home was included.

Mostly recently, the deadline by which homebuyers need to complete their home purchases in order to qualify for the credit was extended to September 30, 2010. Buyers are still be required to have been entered into a binding contract before May 1, 2010. The extension was provided by H.R. 5623, the Homebuyer Assistance and Improvement Act of 2010. Due to several unrelated provisions contained in the bill the estimated $140 million 10-year cost of the extension was mostly off-set.

This report provides an economic analysis of the homebuyer tax credit. Recent data suggest that home prices in general may be stabilizing and that the home inventory is beginning to return to a more normal level. Given the close proximity of these improvements to when the homebuyer tax credit was enacted by HERA and first modified by ARRA, one could argue that the tax credit was the cause of these improvements. A correlation, however, does not imply causation. Around the same time, home prices were falling and mortgage rates were approaching recent historic lows, which may have led more homebuyers to enter the market.

Results presented in this report suggest that lower home prices and low mortgage rates were quantitatively more important in stabilizing the housing market than the tax credit. For example, the effect of home prices and mortgage rates on the typical buyer's mortgage payment is estimated to have been about eight times that of the first two versions of the tax credit. In addition, lower home prices and mortgage rates tended to benefit first-time and repeat buyers, as opposed to the tax credit which until recently just benefited the former.

Estimates of the number of additional home purchases that can be attributed to the ARRA and WHBAA versions of tax credit are presented and compared to those reported by private industry analysts. The estimates raise questions about those reported by industry analysts, as well as questions about how effective the tax credit may have been at reducing the home inventory. The analysis also investigates the tax credit's ability to support the housing market moving forward.

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Introduction

There have been three different versions of the homebuyer tax credits enacted since the summer of 2008. In July 2008, Congress enacted a first-time homebuyer tax credit as part of the Housing and Economic Recovery Act of 2008 (HERA; P.L. 110-289).[1] The tax credit was originally set to expire on July 1, 2009. The American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5) increased the tax credit's value and extended its expiration date to December 1, 2009. Most recently, the Worker, Homeownership, and Business Assistance Act of 2009 (WHBAA; P.L. 111-92) extended the tax credit through the first half of 2010 and expanded it to repeat homebuyers. The Joint Committee on Taxation (JCT) has estimated the 10-year cost of the most recent version of the tax credit to be $10.8 billion.[2] In comparison, the original HERA version of the first-time homebuyer tax credit was estimated to cost $4.9 billion over 10 years, while the 10-year cost of the modifications made by ARRA was estimated to be $6.5 billion.[3]

Originally, the first-time homebuyer tax credit was intended to reduce the excess inventory of homes and stabilize falling home prices. The most recently available data suggest that home prices in general may be stabilizing, at least temporarily. In addition, the home inventory appears to be returning to a more normal level. Given the close proximity of these improvements to when the homebuyer tax credit was enacted by HERA and first modified ARRA, one could argue that the tax credit was the cause of these improvements. A correlation, however, does not imply causation. Around the same time the homebuyer tax credit was enacted, home prices were falling and mortgage rates were approaching recent historic lows, which may have led more homebuyers to enter the market.

This report provides an economic analysis of the homebuyer tax credit. It begins by providing an overview of the tax credit and presenting data on the number of credits claimed thus far. A review of current market conditions is then presented. This is followed by an analysis of the effect that the HERA and ARRA versions of the tax credit had on a typical buyer's mortgage payment compared to home prices and mortgage rates. Estimates of the number of home purchases that may be attributable to the ARRA and WHBAA versions of the tax credit are reported and compared to private industry estimates. The analysis concludes by investigating the ability of the tax credit to provide support to the housing market moving forward.

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[1] The Housing and Economic Recovery Act of 2008 was intended to strengthen the regulation of Freddie Mac and Fannie Mae, modernize the Federal Housing Administration, and provide assistance for homeowners unable to pay their current mortgage. For more information on the act see CRS Report RL34623, *Housing and Economic Recovery Act of 2008*, coordinated by N. Eric Weiss.

[2] U.S. Congress, Joint Committee on Taxation, Estimated Revenue Effects Of Certain Revenue Provisions Contained In The "Worker, Homeownership, And Business Assistance Act Of 2009", committee print, prepared by JCT, 111th Cong., 1st sess., November 3, 2009, JCT-45-09 (Washington: GPO, 2009).

[3] U.S. Congress, Joint Committee on Taxation, Estimated Budget Effects Of The Tax Provisions Contained In H.R. 3221, The "Housing And Economic Recovery Act Of 2008," Scheduled For Consideration By The House Of Representatives On July 23, 2008, committee print, prepared by JCT, 110th Cong., 2nd sess., July 23, 2008, JCX-64-08 (Washington: GPO, 2008) and U.S. Congress, Joint Committee on Taxation, Estimated Budget Effects Of The Revenue Provisions Contained In The Conference Agreement For H.R.1, The "American Recovery And Reinvestment Tax Act of 2009", committee print, prepared by JCT, 111th Cong., 1st sess., Feb 12, 2009, JCX-19-09 (Washington: GPO, 2009).

The Homebuyer Tax Credit

Homebuyers in 2008

The original (HERA) version of the homebuyer tax credit only applied to first-time buyers who purchased a home after April 8, 2008, and before January 1, 2009.[4] Eligible buyers were allowed a refundable credit against their federal income tax equal to a maximum of 10% of a home's purchase price, or $7,500. The amount of the credit that could be claimed was reduced for individuals with modified adjusted gross income (AGI) of more than $75,000 ($150,000 for joint filers), and was zero for those individuals with modified AGI in excess of $95,000 ($170,000 for joint filers). To qualify for the credit the buyer must not have had an interest in a principal residence in the last three years.[5]

Those who claimed the 2008 first-time homebuyer tax credit must repay the tax credit in equal installments over 15 years beginning in the second taxable year after the purchase of a home. Given that interest does not accumulate during the repayment period, the repayable tax credit equates to an interest free loan with a 16-year repayment period (a 1-year grace period plus 15 years of payments). The annual repayment is equal to one-fifteenth the amount of the original tax credit. Should the home be sold or no longer used as the owner's principal residence, the entire tax credit is to be repaid in the tax year when such change in use of the property occurs. The recaptured amount may not exceed any gain realized by the sale of the house.

The 2008 homebuyer tax credit was refundable, which allowed lower-income households with little or no tax liability to take full advantage of the credit. For example, consider a first-time homebuyer who owes $5,000 in income taxes. Assuming the buyer and the home purchase qualify for a $7,500 tax credit, the buyer's tax liability would be reduced to zero, and the buyer would receive a $2,500 refund check from the Treasury. In contrast, if the tax credit were nonrefundable, the buyer's tax liability would be reduced to zero, but the buyer would receive no refund check from the Treasury.

Homebuyers in 2009 and 2010

The second (ARRA) version of the tax credit, passed in February 2009, was available for first-time buyers who purchased a home anytime from January 1, 2009, to November 6, 2009. The credit amount was set equal to a maximum of 10% of a home's purchase price, or $8,000. The tax credit remained refundable, although the repayment requirement was removed. The income limits remained unchanged so that the credit amount was reduced for individuals with modified AGI of more than $75,000 ($150,000 for joint filers), and was zero for those individuals with modified AGI in excess of $95,000 ($170,000 for joint filers).

The third (WHBAA) version of the homebuyer tax credit was made available for home purchases made after November 6, 2009, and before July 1, 2010. WHBAA required that a homebuyer be entered into a binding written contract before May 1, 2010, and complete the home purchase by July 1, 2010, to qualify for the credit. The credit is available to first-time as well as repeat

[4] When the tax credit was first enacted the expiration date was set July 1, 2009. ARRA later extended this expiration date to December 1, 2009, which was extended once again by WHBAA to July 1, 2010.

[5] Principal residence is not defined explicitly in the Internal Revenue Code (IRC) section that created the tax credit. For a more detailed discussion on this issue see CRS Report RL34664, *The First-Time Homebuyer Tax Credit*, by Carol A. Pettit. Taxpayers who are allowed the District of Columbia's homebuyer tax credit are not allowed the first-time homebuyer tax credit.

homebuyers. For first-time homebuyers, the maximum credit amount is limited to 10% of a home's purchase price, or $8,000. The maximum credit amount is reduced to $6,500 for repeat homebuyers. To qualify as a repeat buyer the taxpayer must have owned and used their previous house as their principal residence for five consecutive years during the eight-year period ending with the home purchase. The credit amount is reduced for homebuyers (first-time or repeat) with modified AGI of more than $150,000 ($225,000 for joint filers), and is zero for those individuals with modified AGI in excess of $170,000 ($245,000 for joint filers). Purchasers of homes with prices exceeding $800,000 are ineligible for the latest version of the credit.

The Homebuyer Tax Credit at a Glance

	HERA (July 2008)	**ARRA** (Feb 2009)	**WHBAA** (Nov 2009)
t-Time Buyers Only	Yes	Yes	No
ximum Credit	$7,500	$8,000	$8,000/$6,500
ome Phase-Out Range	Single: $75,000 to $95,000 Joint: $150,000 to $170,000	Single: $75,000 to $95,000 Joint: $150,000 to $170,000	Single: $150,000 to $175,0 Joint: $225,000 to $245,00
ayable	Yes	No	No
undable	Yes	Yes	Yes
licable Dates	Apr 9, 2008, to Dec 31, 2008	Jan 1, 2009, to Nov 6, 2009	Nov 7, 2009, to June 30 2010
ximum Purchase Price	No	No	Yes ($800,000)

The changes also include special rules regarding members of the Armed Forces and individuals who serve on qualified official extended duty. Specifically, the requirement that a homebuyer repay the tax credit if their home is no longer used as their principal residence within the first three years is waived for members of the Armed Forces and certain other individuals who must sell their house as the result of government orders for qualified official extended duty. All other taxpayers are subject to the three-year repayment (or recapture) requirement. In addition, the tax credit deadlines are extended by one year for individuals who serve on qualified official extended duty outside the United States for 90 days before May 1, 2010.[6]

Mostly recently, the deadline by which homebuyers need to complete their home purchases in order to qualify for the credit was extended to September 30, 2010. Buyers are still required to have been entered into a binding contract before May 1, 2010. The extension was provided by H.R. 5623, the Homebuyer Assistance and Improvement Act of 2010. Due to several unrelated provisions contained in the bill, the estimated $140 million 10-year cost of the extension was mostly off-set.

Any homebuyer claiming the tax credit in 2009 or 2010 may elect to treat an eligible purchase as having occurred in the previous year for tax purposes. The ability to treat a home purchase as having occurred in the previous tax year enables a homebuyer to receive the benefit of the tax credit more quickly. For example, a homebuyer in 2009 may claim the tax credit on a 2008 tax return by filing an amended tax return. Normally, a homebuyer would have to wait until spring 2010 (when 2009 taxes are filed) to claim the tax credit. Likewise, a homebuyer in 2010 would normally have to wait until spring 2011 to claim the tax credit, but because of this provision can either claim the credit on a 2009 tax return (if the purchase is made prior to filing the 2009

[6] Qualified official extended duty is defined in IRC §121(d)(9)(C)(i).

return), or by filing an amended 2009 tax return (if the purchase is made after filing the 2009 return).

The Department of Housing and Urban Development (HUD) has released conditions under which the first-time homebuyer tax credit could be "monetized" and made available for use at closing. The tax credit may either be monetized via a loan to the buyer, or by being purchased from the homebuyer in an amount not to exceed the tax credit he or she is expected to receive. The tax credit may only be monetized when the buyer uses an FHA-insured mortgage. Regardless, the monetized tax credit may not be used to satisfy the FHA required 3.5% down payment. However, the tax credit may be used to make an additional down payment, to buy down the mortgage rate, or put toward closing costs. It remains to be seen if the monetization program will be extended to repeat buyers.

Number of First-Time Homebuyer Tax Credits Claimed

The IRS has recently released preliminary figures on the number of first-time homebuyer tax credits claimed.[7] Thus far, 1.4 million first-time homebuyers have claimed approximately $10 billion worth of tax credits. This includes those who claimed either the $7,500 repayable or $8,000 non-repayable first-time homebuyer credit for home purchases made between April 9, 2008, and August 24, 2009. The majority of the tax credit claims (approximately 1 million) thus far have been for the $7,500 credit. The average tax credit claimed was $7,004.

The IRS has also released a state-by-state breakdown of the number and dollar amount of tax credits claimed. This information is reported in **Table A-1** in **Appendix A**. Roughly 28% of the number of credits claimed and dollar amount of tax credits claimed were concentrated among three states: California, Florida, and Texas. This is not surprising given the population of these states. No other state accounted for more than 4% of all tax credits claimed. The average tax credit amount claimed ranged from $6,540 (West Virginia) to $7,377 (Utah).

While the IRS data reveal the number of people who have utilized the tax credit, they do not by themselves provide an indication of how effective the credit has been. This depends partly on how many additional home purchases can be attributable to the credit. Some fraction of the 1.4 million people who claimed the tax credit likely represented new buyers incentivized into the market by the credit, while the majority of the other claimants likely were buyers who had already decided to purchase a home, and simply claimed the tax credit because it was available. Still, as recent reports are suggesting, some of those claiming the tax credit may have done so fraudulently.[8]

It is important to point out that the data reported by the IRS include nearly four months of first-time homebuyer activity that benefited from the tax credit but that could be argued to not have been influenced by the credit. The homebuyer tax credit was originally enacted on July 30, 2008, but could have been claimed retroactively for home purchases as far back as April 9, 2008. Those who claimed the tax credit retroactively likely did not represent new home buying activity that

[7] Internal Revenue Service, "First-Time Homebuyer Credit Provides Tax Benefits to 1.4 Million Families to Date, More Claims Expected," press release, IR-2009-83, September 17, 2009, http://www.irs.gov/newsroom/article/0,,id=213375,00.html. Dates reported were not in the IRS press release, but were obtained from the IRS Media Relations Office.

[8] See, U.S. Government Accountability Office, *First-Time Homebuyer Tax Credit: Taxpayers' Use of the Credit and Implementation and Compliance Challenges*, GAO-10-166T, October 22, 2009, http://www.gao.gov/products/GAO-10-166T, and Treasury Inspector General For Tax Administration, *The Internal Revenue Service Faces Significant Challenges In Verifying Eligibility For The First-Time Homebuyer Credit*, 2009-41-144, Washington, DC, September 29, 2009, http://www.tigta.gov.

occurred because of the credit since the credit was not available to them when they decided to purchase a home. Thus, although those that bought a home between April 9, 2008, and July 30, 2008, may have claimed the tax credit, they may not have been incentivized by it.

Housing Market Conditions

This section provides a brief summary of current housing market conditions and identifies risks to the housing market moving forward. The original intent of the first-time homebuyer tax credit was to address falling home prices and an elevated home inventory. The tax credit was extended and expanded to repeat buyers to provide continued support to the housing market and to provide stimulus to the broader economy. Reviewing current conditions is useful for understanding how effective the first-time homebuyer may have been achieving its intended objective. Discussing conditions moving forward is useful for understanding the impact that extending and expanding the tax credit may have.

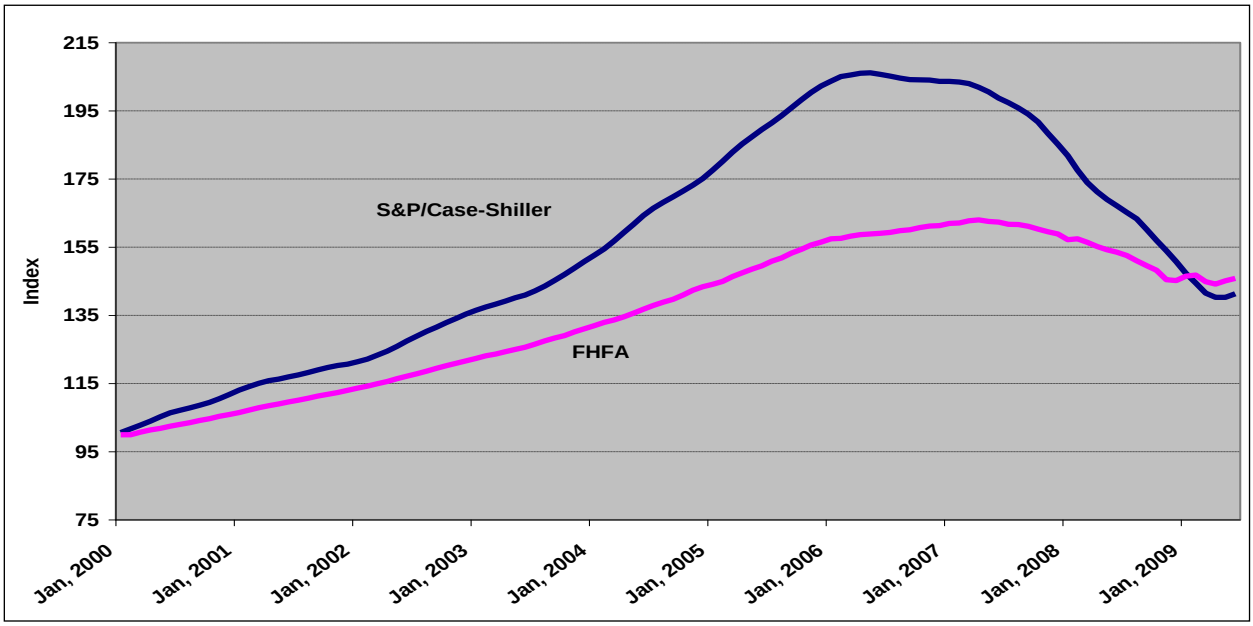
Home Prices

There are signs that overall home prices may be stabilizing, at least temporarily. The top half of **Figure 1** plots the S&P/Case-Shiller (Case-Shiller) home price index and the Federal Housing Finance Agency (FHFA) home price index—two popular measures of home prices.[9] After nearly three years of steady declines, the Case-Shiller index remained stable between March and May of 2009, before increasing in both June and July. In addition, the FHFA index has remained more or less flat since in November 2008. Still, home price behavior has been different depending on the particular market considered. Prices in certain markets are still falling, while prices in other markets have begun to rise. **Figure B-1** in **Appendix B** provides a graphical summary of home prices for seven metropolitan areas contained in the broader Case-Shiller composite index.

[9] The Case-Shiller index measures the prices of repeat single-family home sales in 20 large metropolitan markets and is generally thought to provide a good measure of overall home prices, although it more heavily weights larger housing markets, and does not reflect price in smaller Midwest markets. In contrast, the FHFA index measures single-family home prices in all 50 states. The FHFA index, however, only includes homes purchased with a conventional mortgage that can be purchased by Fannie Mae or Freddie Mac. The FHFA home price index previously was known as the Office of Federal Housing Enterprise Oversight (OFHEO) home price index.

Figure 1. S&P Case-Shiller and FHFA Home Price Indices

January 2000 to July 2009



Source: Standard and Poor's and FHFA.

Home prices across the low-, mid-, and high-priced markets are beginning to converge back to a common path—behavior which is consistent with home price stabilization. During the run-up in housing, home values across the low-, mid-, and high-priced markets departed from their historical trend of moving together. Typically home values in the low-priced market increased fastest as first-time buyers rushed into the market, followed by the mid- and high-priced markets.[10] However, prices across the three tiers have not begun to move in complete unison in every region of the country which may indicate further price corrections could occur. See **Figure C-1** in **Appendix C** for a summary of regional housing markets by price tier.

Even with home values across price tiers beginning to appear to stabilize, there are reports that the share of foreclosures attributable to the high end of the market is increasing. Online real estate service provider Zillow.com recently reported that the fraction of foreclosures attributable to the top one-third of the housing market stood at 30% in June 2009.[11] This is approximately double the share of foreclosures that the top one-third was responsible for in 2006. The fall in home prices at the higher end is likely being driven by foreclosures and rising unemployment, which, in turn, is re-enforcing foreclosures. As a result, prices of higher-end homes may have some time before they stabilize fully. While foreclosures are picking up at the higher end of the market, the share attributable to the bottom one-third of the housing market appears to have fallen from 55% to 35%. The data suggest that the lower-priced market may be close to stabilizing.

[10] One exception is the Las Vegas market which initially witnessed prices in the mid- and high-priced markets increase faster than the low-priced market.

[11] Nick Timiraos, "Foreclosures Grow in Housing Market's Top Tiers," *Wall Street Journal*, October 13, 2009, http://online.wsj.com/article_email/SB125530360128479161-lMyQjAxMDI5NTE1MjMxMDIzWj.html.

Home Inventory

Table 1. New and Existing Home Inventory

(measured in months)

	Inventory			Inventory	
Month	**New**	**Existing**	**Month**	**New**	**Existing**
July 2008	10.1	11.0	March 2009	10.7	9.6
Aug. 2008	10.9	10.6	Apr. 2009	10.1	10.1
Sept. 2008	10.4	10.1	May 2009	10.2	9.8
Oct. 2008	11.1	10.2	June 2009	8.8	9.4
Nov. 2008	11.5	11.0	July 2009	7.5	9.3
Dec. 2008	12.9	9.4	Aug. 2009	7.3	9.3
Jan. 2009	13.3	9.7	Sept. 2009	7.5	8.0
Feb. 2009	12.2	9.7	Oct. 2009	6.7	7.0

Source: U.S. Census Bureau and National Association of Realtors.

Notes: NAR estimates for October 2009 are preliminary.

There are also indications that the inventory (supply) of homes on the market may be returning to a more normal level. The housing inventory is measured as the number of months it would take the quantity of homes on the market to be sold given the current rate of sales. A stable housing market has historically been associated with a 5.0 to 6.0 month home inventory. The latest data presented in **Table 1** reveal that the existing home inventory currently stands at an 7.0 months supply, down from a high of 11.0 months in November 2008. Likewise, the new home inventory currently stands at a 6.7 months supply.[12] This is down from a peak of 13.3 months, which was reached in January 2009.

Other Indicators

Other indicators also suggest that the housing market may be beginning to stabilize. For example, the National Association of Realtors (NAR) reported on September 1, 2009, that pending home sales, an indicator of where the market is headed, rose for the sixth straight month, something the NAR says has not occurred since 2001.[13] In response, NAR chief economist Lawrence Yun said that "the rise in pending home sales is clearly implying that the worst in housing is over."[14] Home builder confidence also appears to be on the rise. On September 16, 2009, the National Association of Home Builders (NAHB) reported that builder confidence for the single family homes market increased for the third consecutive month.[15] While builder confidence may be

[12] Estimates of the new home inventory are made by the U.S. Census Bureau, while the National Association of Realtors compiles the existing home inventory estimates.

[13] National Association of Realtors, "Pending Home Sales on a Record Roll," press release, September 1, 2009, http://www.realtor.org/press_room/news_releases/2009/09/record_roll.

[14] Ibid., Interview with NAR chief economist Lawrence Yun, http://link.brightcove.com/services/player/bcpid36344168001?bctid=36362678001.

[15] National Association of Home Builders, " Builder Confidence Edges Up Again In September," press release, September 16, 2009, http://www.nahb.org/news_details.aspx?newsID=9699.

improving, home building activity is still weak. For example, housing starts were at a seasonally adjusted annual rate of 598,000 in August 2009, compared to a historical average of 1.5 million.[16]

Homeownership affordability has improved, which may continue to assist in stabilizing the housing market. For example, according to the National Association of Homebuilders/Wells Fargo Housing Opportunity Index, homeownership affordability is near its highest level in 18 years.[17] Similarly, the NAR First-Time Homebuyer Affordability Index indicates that homeownership has become more affordable for first-time buyers relative to when home prices peaked in the second half of this decade.[18] Much of the increase in affordability is likely the result of falling home prices and low mortgage interest rates. If affordability remains high, buyers could continue to be lured into the market, which could have a positive effect on home prices and help reduce the home inventory.

Mortgage Interest Rates

While mortgage rates are not necessarily an indicator of the current condition of the housing market, they are an important determinant of home buying activity. **Figure 2** displays the average interest rate on a 30-year fixed-rate mortgage since July 2006. Also identified are the dates the homebuyer tax credit was enacted and then modified and enhanced by ARRA. What is important to note is that although mortgage rates were rising slightly at the time the tax credit was enacted, they fell shortly after from around 6.5% to slightly above 5.0% by the time the credit was modified by ARRA. Mortgage rates continued falling until April 2009 when they reached 4.81%, rose slightly, and fell again. The effect mortgage rates may have had in encouraging home buying is discussed in the economic analysis section.

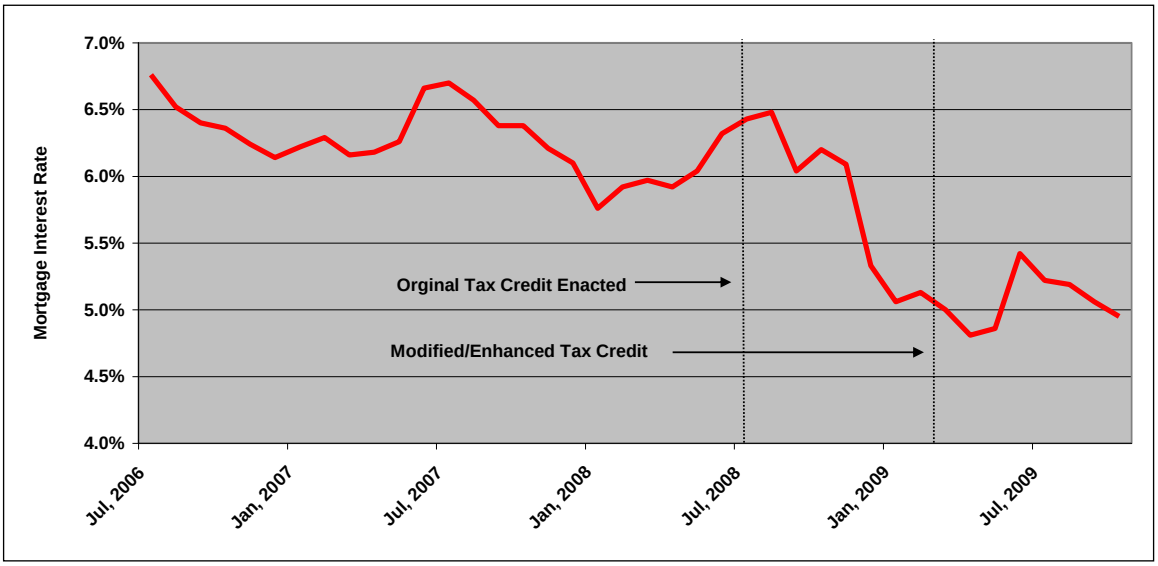
[16] U.S. Department of Commerce, Census Bureau: http://www.census.gov/const/www/newresconstindex.html.

[17] National Association of Home Builders, "Housing Affordability Continues To Hover Near Highest Level In 18 Years," press release, August 19, 2009, http://www.nahb.org/news_details.aspx?sectionID=135&newsID=9635.

[18] National Association of Realtors, "First-Time Homebuyer Affordability," press release, 2009, http://www.realtor.org/wps/wcm/connect/f21f89004f2b1ed5b631f74e813808c1/REL09Q2F.pdf?MOD=AJPERES&CACHEID=f21f89004f2b1ed5b631f74e813808c1.

Figure 2. Fixed 30-Year Mortgage Interest Rates

July 2006 to October 2009



Source: Primary Mortgage Market Survey data provided by Freddie Mac and downloaded from Federal Reserve Bank of St. Louis: http://research.stlouisfed.org/fred2/series/MORTG.

Moving Forward

It is important to emphasize that, moving forward, recent improvements could be reversed if the foreclosure rate continues to rise. The issue of foreclosures has been well documented and has received attention from policy makers since the housing market began to show signs of weakening. Originally, the problem was concentrated among subprime borrowers who, for a variety of reasons, were more susceptible to foreclosure when the housing market began to deteriorate. The concern now is that the foreclosure rate among prime borrowers also appears to be rising. Prime borrowers tended to face more scrutiny from lenders or were perceived to be less risky, which may explain why they were better able to weather the initial downturn in housing. But since home prices continued to fall and unemployment began to rise in late 2007, the foreclosure rate among prime borrowers, and to a lesser degree FHA borrowers, has trended upward.

Elevated unemployment, as is the case in late 2009, could also stunt a recovery in housing. Today, an unemployment rate of around 5.0% to 6.0% is considered consistent with a strong economy and a well functioning labor market.[19] In October 2009 the unemployment rate was 10.2%, and has risen every quarter since the fourth quarter of 2006.[20] Among potential homebuyers, the unemployment rate in the third quarter of 2009 was the highest for the group most likely to represent first-time buyers (those ages 25-34) at 10.3%.[21] If unemployment remains elevated, home buying activity may diminish as concern grows over the ability to make mortgage payments. In addition, elevated unemployment could cause the foreclosure rate to continue to

[19] For a discussion of the natural rate of unemployment, see CRS Report RL32274, *A Changing Natural Rate of Unemployment: Policy Issues*, by Marc Labonte.

[20] U.S. Bureau of Labor Statistics: http://www.bls.gov/news.release/empsit.nr0.htm.

[21] U.S. Bureau of Labor Statistics: ftp://ftp.bls.gov/pub/suppl/empsit.cpseed8.txt.

rise, increasing the supply of homes on the market and putting downward pressure on home prices.

Economic Analysis

The previous section presented evidence that suggests home prices and the home inventory are, at least temporarily, beginning to stabilize. Given the close proximity of these improvements to when the first-time homebuyer tax credit was enacted and modified one may be tempted to conclude that the tax credit was the cause of the housing market improving. A correlation, however, does not imply causation. Around the same time that the homebuyer tax credit was enacted, home prices were falling and mortgage rates were approaching recent historic lows, which may have led more homebuyers to enter the market.

This section analyzes the homebuyer tax credit. It begins by estimating the effects that home prices and mortgage rates had on the mortgage payment of a typical buyer, and comparing them to the effects of the HERA (original) and ARRA (second) versions of the tax credit. The results suggest that home prices, and to a lesser degree mortgage rates, may have been quantitatively more important in reducing the cost of becoming a homeowner than the first-time homebuyer tax credit. Next, estimates of the number of additional first-time purchases that can be attributed to the ARRA and WHBAA versions of tax credit are then presented and compared to private industry estimates. The estimates presented here raise questions about those reported by industry analysts and the role of the tax credit in stabilizing the housing market. The analysis concludes by examining how effective the extended first-time homebuyer tax credit and new repeat buyer tax credit may be at providing continued support to the housing market.

Home Prices, Mortgage Rates, and the HERA and ARRA Homebuyer Tax Credits

To quantify the potential effect of the HERA and ARRA versions of the first-time homebuyer tax credit and compare it to the effect of falling prices and mortgage rates, an estimate was made of how much each reduced the typical buyer's mortgage payment. This was accomplished by first estimating the mortgage payment for a median priced home at the peak of the housing market assuming a 30-year fixed rate mortgage.[22] The mortgage payment was then recomputed three times after accounting for the fall in home prices (price effect); the fall in mortgage rates (mortgage rate effect); and the homebuyer tax credit (tax credit effect). The effect of each factor was then measured as the difference between the mortgage payment at the peak of the housing market and the mortgage payment after each factor changed.

Several assumptions were made to carry out the estimation. The first assumption relates to the peak of the housing market. As **Figure 1** shows, the two most popular measures of home prices, the Case-Shiller and FHFA indices, disagree as to exactly when this occurred. The Case-Shiller index peaked in May 2006, while the OFHEO index peaked in April 2007. In addition, regional markets tended to peak at different times. As a compromise, the peak of the housing market was chosen as January 2007. The median existing home sales price ($210,600) was then chosen as the median home price at the peak of the housing market, and the mortgage rate was assumed to be the rate that prevailed at the time.[23]

[22] For simplicity the mortgage payment was based on the assumption of no down payment, insurance, taxes, etc.

[23] Regional median home prices may vary substantially.

The next assumption concerns the decrease in home prices. Since the Case-Shiller and the FHFA indices provide different estimates, the decrease in home prices was calculated three times using the Case-Shiller index, the FHFA index, and the average of the two. Each time, the percentage decrease in the index was used to compute how much the median home price fell from the peak of the market to when the tax credit was enacted. Lastly, the tax credit was assumed to effectively lower the purchase price of a home. For the $8,000 ARRA tax credit which was available to 2009 homebuyers this is straightforward. But the original $7,500 tax credit available in 2008 must be repaid, which lowers its effect on a home's purchase price. After accounting for repayment, the $7,500 tax credit was estimated to have a reduced a home's purchase price by $2,104 or 1.0%.[24]

Table 2 presents the estimation results separately for the $7,500 HERA tax credit for 2008 homebuyers and the $8,000 ARRA tax credit for 2009 homebuyers. Consider the results for the 2008 tax credit first (top half of table). At the peak of the housing market, a potential buyer of a median price home would have been required to make a monthly mortgage payment of $1,293. Between the peak of the housing market and when the tax credit was enacted, home price decreased from $210,600 to $187,595, or an average of 11%. The column labeled "Price Effect" shows that this decrease in home prices is estimated to have reduced a potential buyer's mortgage payment by $141 a month, or $1,694 annually. Over the same time period, mortgage interest rates actually increased slightly from 6.22% to 6.43%. The column labeled "Mortgage Rate Effect" indicates that this rise in mortgage rates increased a buyer's monthly mortgage payment by an estimated $29 and annual monthly payment by $346.

The top half of **Table 2** also shows that the HERA homebuyer tax credit is estimated to have reduced a typical first-time homebuyer's mortgage payment by about $13 a month or $156 annually. To understand the impact of the $7,500 tax credit, consider that the reduction in a typical buyer's mortgage payment that can be attributed to the credit is less than one-tenth the reduction that can be attributed to falling home prices. That is, the benefit to potential home buyers from falling home prices was more than 10 times the benefit received from the tax credit. The last column of **Table 2** shows that the total effect of home prices, mortgage rates, and the 2008 tax credit resulted in the typical homebuyer's mortgage payment falling $129 a month or $1,544 a year compared to the peak of the housing market.

The bottom half of **Table 2** reports the estimation results for the ARRA version of the homebuyer tax credit. By the time the ARRA tax credit became available in February 2009 home prices had fallen an average of 19% from the peak of the market. The home price decline alone is estimated to have decreased a typical homebuyer's monthly mortgage payment by $247 and annual mortgage payment by $2,970. The decrease in mortgage rates that began in mid-2008 and continued until after the 2009 credit was enacted is estimated to have reduced the median mortgage payment by $145 a month or $1,743 annually.

Due to the removal of the repayment requirement and the increased credit amount, the ARRA version of the homebuyer tax credit had a larger effect on the cost of owning a home than the HERA version of the credit. Specifically, **Table 2** presents estimates that suggest the ARRA tax credit reduced the median monthly mortgage payment by $49 and the annual mortgage payment by $589. The results imply that the ARRA tax credit had about one-fifth the impact that falling home prices did, and one-third the effect of lower mortgage rates. Combined, home prices and

[24] The effective value of the $7,500 repayable tax credit was computed as the present value of the tax credit under the assumption that a buyer remains in their home for six years (the average for first-time buyers) and a discount rate of 6.43% (mortgage interest rate at the time). Since their is a one year "grace" period before repayment begins, the taxpayer would pay nothing in the first year of homeownership, $500 in years four through five, and then $5,500 in the sixth year (moving before repayment requires the buyer to repay the remaining amount).

mortgages rates were estimated to be eight times more powerful at lowering the cost of homeownership than the tax credit.

That low home prices, together with low mortgage rates, appear to have provided the largest incentive to purchase a home is important. Unlike the tax credit, which only benefited first-time buyers, lower prices and mortgages rates benefited all buyers (first-time and repeat). As a result, lower home prices and mortgage rates may have played a larger role in stabilizing the housing market than the tax credit since the incentive that they provided was larger and more widespread than the incentive provided by the homebuyer tax credit.

At the same time, the price effects reported in **Table 2** may understate the influence falling prices had in some markets. The results reported above were based on the average change in home prices as computed from the average of the Case-Shiller and FHFA price indices. But the Case-Shiller index, which captures price changes in some of the larger bubble-prone markets, fell an average of 18% and 29%, respectively, leading up to the tax credit's enactment and modification. Prices in some harder hit markets such as Las Vegas, Miami, Phoenix, San Diego, and San Francisco fell by as much as 30% prior to the tax credit, and by as much as 50% prior to its modification. Estimating the effect of falling home prices for these markets, which is presumably larger than the analysis above, would greatly reduce the relative effect of the tax credit effect.

Along the same lines, the price effects reported in **Table 2** may overstate the influence falling prices had in some markets. There are smaller housing markets, particularly in the Midwest, where the decline in home prices was relatively small when compared to some larger "bubble" markets. In addition, before the housing crisis, home prices in these markets were usually lower than the national average. As a result, the effect of falling home prices may have been smaller than the effect of the tax credit in some areas of the country.

Understanding regional difference in falling prices is important to understanding the effectiveness of the homebuyer tax credit. Markets that had the largest home inventories also experienced some of the largest declines in prices. And it was the decline in home prices that appears to be what may have provided the majority of the incentive to purchase a home. So in markets that were hardest hit by the housing downturn the homebuyer tax credit may have had a minor effect when compared to the effect of lower home prices.

Table 2. Estimated Reduction In Mortgage Payment from Home Prices, Mortgage Rates, and the Homebuyer Tax Credit

2008 HERA Tax Credit ($7,500 repayable)	**Median Home Price**	**Price Effect** Average (-11%)	**Mortgage Rate Effect** (6.22% to 6.43%)	**Tax Credit Effect** ($7,500)	**Total Effect**
Home Price	$210,600	$187,595	$210,600	$208,496	$185,491
Monthly Mortgage Payment	$1,293	$1,151	$1,321	$1,280	$1,164
Reduction in Monthly Payment		$141	-$29	$13	$129
Reduction in Annual Payment		$1,694	-$346	$155	$1,544

2009 ARRA Tax Credit ($8,000 non-repayable)	**Median Home Price** (January 2007)	**Price Effect** Average (-19%)	**Mortgage Rate Effect** (6.22% to 5.15%)	**Tax Credit Effect** ($8,000)	**Total Effect**
Home Price	$210,600	$170,280	$210,600	$202,600	$162,280
Monthly Mortgage Payment	$1,293	$1,045	$1,147	$1,243	$884
Reduction in Monthly Payment		$247	$145	$49	$409
Reduction in Annual Payment		$2,970	$1,743	$589	$4,902

Source: CRS calculations.

Notes: The total reduction in the mortgage payment is not the simple sum of the Price, Interest, and Tax Credit Effects because the relationship between the interest rate and mortgage payment is non-linear.

In addition, the estimates presented in **Table 2** were derived using the national median purchase price at the peak of the market, rather than when the tax credit was enacted or modified. **Table D-1** in **Appendix D** reports the estimates assuming the median purchase price at the time the tax credit was modified in February 2009. The dollar amounts are essentially the same and the effects of home prices and mortgage rates relative to the tax credit are also quite close to the results presented in **Table 2**.

Estimates of Home Purchases Attributable to the ARRA and WHBAA Homebuyer Tax Credits

It is possible to estimate how many additional home sales may be attributable to the tax credit given a measure of how responsive home purchases are to price changes.[25] Recall that the tax credit effectively lowers the purchase price of a home. Generally, economists measure how sensitive consumers are to price changes by using a "price elasticity." Price elasticity is defined as the percent change in a quantity purchased, in this case homes, in response to a given percent price change. Estimates for the price elasticity of home purchases vary but generally fall in the -0.5 to -1.0 range.[26] This range implies that the number of home purchases increases between 0.5% to 1.0% for every 1.0% decrease in home prices. Combining home purchase data with estimates of price elasticity allows for the number of additional home sales attributable to the tax credit to be computed.

The top half of **Table 3** reports the CRS estimated number of additional home purchases that could be expected to be attributable to the ARRA and WHBAA versions of the tax credit. The estimates should be interpreted as the number of additional home purchases that the tax credit could have originally been expected to elicit at the time of enactment if the credit was left unaltered until it expired. This approach allows for a comparison to estimates made by industry analysts around the time the ARRA and WHBAA versions of the credit were being debated. Because estimates of the price elasticity vary, three different values were used; -0.5, -1.0, and -1.5. The last price elasticity was included because a buyer's response to a temporary tax credit may be higher than a typical price change. Depending on the assumed responsiveness of buyers to price changes, it was estimated that the ARRA tax credit could have been expected to result in between 42,790 and 128,371 additional home purchases, while it was estimated that the WHBAA tax credit could be expected to result in between 51,523 and 153,760 additional purchases.[27]

Table 3. Estimated Additional Home Purchases Attributable to the ARRA and WHBAA Versions of the Homebuyer Tax Credit At Time of Enactment

	Estimated Additional Home Purchases	
CRS Assumption of Price Elasticity	**ARRA First-Time Homebuyer Tax Credit**	**WHBAA First-Time and Repeat Homebuyer Tax Credit**
-0.5	42,790	51,253

[25] The qualifier "additional" is used to distinguish purchases attributable to the tax credit from those that would have occurred anyway.

[26] Harvey S. Rosen, "Housing Subsidies: Effects on Housing Decisions, Efficiency, and Equity," *National Bureau of Economic Research*, Working Paper 1161 (June 1983), and Todd Sinai, "Urban Housing Demand," in *The New Palgrave Dictionary of Economics,* ed. Steven N. Durlauf and Lawrence E. Blume , 2nd ed. (Palgrave Macmillan, 2008).

[27] See **Appendix E** for a summary of the data and calculations used to derived these estimates.

	Estimated Additional Home Purchases	
CRS Assumption of Price Elasticity	**ARRA First-Time Homebuyer Tax Credit**	**WHBAA First-Time and Repeat Homebuyer Tax Credit**
-1.0	85,581	102,507
-1.5	128,371	153,760
Private Industry Analyst	**ARRA First-Time Homebuyer Tax Credit**	**WHBAA First-Time and Repeat Homebuyer Tax Credit**
NAHB	200,000	180,000
NAR	350,000	N/A
Moody's	400,000	N/A

Source: CRS calculations, in addition to data obtained from:NAHB, http://www.nahb.org/news_details.aspx?newsID=9809 and http://www.nahb.org/news_details.aspx?sectionID=148&newsID=10029; NAR, http://www.realtor.org/press_room/news_releases/2009/09/record_roll; and Moody's, http://blogs.wsj.com/economics/2009/09/08/home-buyer-tax-credit-added-400000-sales-zandi-says/.

The bottom half of **Table 3** reports estimates by private industry analysts of the number of additional home purchases that each version of the tax credit was originally expected to generate. Only the NAHB provided a publicly available estimate of the WHBAA version of the credit. It is immediately apparent that private industry analysts' estimates are higher than those reported in the top half of the table. One explanation, which is important for the estimates of ARRA first-time homebuyer tax credit, is that industry estimates likely attempt to account for a "trade-up" effect; existing homeowners, who were not eligible for the first-time buyer tax credit, moving up in the market due to the increased demand for their own entry-level homes. But still, the estimates appear to be assuming either a rather large trade-up effect, or that buyers are particularly sensitive to price changes, or both. In the end, however, it is difficult to understand exactly how industry analysts arrived at their estimates. Information about assumptions, data, and the exact methodology used are unknown.[28]

The additional purchases generated by the credit should have had a significant impact on the inventory of unsold homes if the tax credit had been a driving force in the stabilization of home prices. When ARRA enhanced the homebuyer tax credit by removing the repayment requirement and increasing the credit amount to $8,000 the total home inventory (new and existing) was at a 9.7 months supply.[29] The industry estimates reported in **Table 3** imply that the ARRA version of the homebuyer tax credit could have been expected to reduce the total home inventory from a 9.7 months supply to between an 8.9 to 9.3 months supply, or by 4% to 8%. One could question how big an impact a 4% to 8% reduction in the home inventory may have had on stabilizing the housing market given that the inventory was at times more than double what is considered normal. It could also be argued that the tax credit's impact on the home inventory may have been

[28] The NAHB has released a report that partially explains how they may be estimating the effect of the 2009 homebuyer tax credit. The report suggests that they are assuming an elasticity of -1.0, however, the report lacks important details that prevent reproduction of the results. Likewise, neither NAR or Moody's has provided a description of their methodologies, and hence, their estimates can not be reproduced directly either. The NAHB's report may be found at http://www.nahb.org/generic.aspx?sectionID=734&genericContentID=104893&channelID=311.

[29] **Table 1** shows that the existing home inventory was 9.7 months, while the new home inventory was 11.1 months. The new home inventory was so small relative to the existing inventory that the total inventory was largely determined by the existing home inventory.

even smaller if the estimates made by industry analysts about the number of additional purchases are believed to be too generous.

The number of additional home purchases attributable to either version of the tax credit may be significantly less than those attributable to lower home prices and mortgage rates. Recall that the previous section estimated that the combined effect of falling home prices and mortgage rates on a typical buyer's mortgage payment was around eight times that of the ARRA version of the homebuyer tax credit. In addition, lower home prices and mortgage rates benefited homebuyers across the board (repeat and first-time) as opposed to just first-time buyers. Thus, the improvements in the housing market (stabilized home prices and falling inventory) that occurred around the time of the HERA and ARRA versions of the credit may have been more the result of lower home prices and mortgage interest rates.

Continued Housing Market Support and the WHBAA Homebuyer Tax Credit

Two common rationales that have been offered for the extended and expanded WHBAA version of the tax credit are that it will continue to support the housing market and may also have a stimulative effect on the broader economy. This section focuses exclusively on analyzing the credit as a tool for supporting the housing market moving forward. The wide range of policy tools and options for stimulating the economy place such an analysis beyond the scope of this report.

The expansion of the tax credit to repeat buyers allows the credit to be taken advantage of by a larger pool of potential homebuyers, and may increase the credit's ability to stimulate aggregate home buying. As a result, the modified homebuyer credit may increase the rate at which the home inventory is drawn down, leading the housing market to fully stabilize sooner rather than later. The stimulative effect of the tax credit would likely be greatest if the modifications are viewed as temporary. If potential buyers come to expect that the credit will be available in the future then the incentive to purchase a home now is reduced. In addition, the temporary nature of the tax credit reduces the potential that its value is built into home prices as sellers respond by raising prices.

The simulative effect on home buying activity from expanding the credit to repeat buyers, however, may be limited. Repeat buyers typically purchase higher priced homes than first-time buyers. But the incentive provided by the tax credit to purchase a home falls as home prices increase. The tax credit amount is also reduced for repeat buyers, which may limit the potential of the credit to stimulate home buying further. For example, the $8,000 first-time homebuyer tax credit reduces the purchase price of a $200,000 by 4.0%, while the $6,500 repeat buyers tax credit only reduces the purchase price of a $400,000 house by 1.6%. In addition, to take a advantage of the tax credit a repeat buyer will typically have to sell a home, which will often require paying a real estate agen and incurring other costs, possibly reducing the credit's incentive more. As a result, extending the tax credit to repeat buyers may increase the likelihood that the credit is simply claimed by those that would have purchased a home regardless. This may be particularly true if it is believed that the overriding determinants of home buying activity are currently low home prices and mortgage rates.

The tax credit may also be of limited use if conditions in the housing market begin to deteriorate. One of the biggest threats to the housing market moving forward is rising foreclosure rates, which, at this point in the housing downturn, are being driving primarily by rising unemployment. And although the tax credit has been expanded to repeat homebuyers partly to address foreclosures in the mid- to high-priced markets, the tax credit has little direct effect on the employment status of unemployed homeowners. As a result, the tax credit may not be effective at

preventing foreclosure rates from rising. The expanded tax credit, however, may reduce the time foreclosed homes remain on the market. At the same time, lower home prices may still be the primary determinant for a potential buyer.

Appendix A. Tax Credits Claimed On A State-by-State Basis

Table A-1. First-Time Homebuyer Tax Credits Claimed By State

(includes 2008 and 2009 tax credit claims)

State	Number of Credits Claimed	Percent of Total	Amount of Credits Claimed	Percent of Total Amount Claimed
Alabama	25,302	1.78%	$177,295,315.44	1.78%
Alaska	3,126	0.22%	$21,545,975.59	0.22%
Arizona	38,121	2.68%	$275,350,149.40	2.76%
Arkansas	14,664	1.03%	$99,851,701.98	1.00%
California	160,325	11.26%	$1,147,477,744.15	11.50%
Colorado	27,165	1.91%	$193,491,734.66	1.94%
Connecticut	12,211	0.86%	$84,853,591.28	0.85%
Delaware	3,893	0.27%	$27,450,093.28	0.28%
District of Columbia	1,329	0.09%	$9,059,596.92	0.09%
Florida	105,608	7.42%	$768,065,936.94	7.70%
Georgia	55,790	3.92%	$397,876,065.02	3.99%
Hawaii	3,150	0.22%	$21,935,330.84	0.22%
Idaho	8,543	0.60%	$62,085,787.02	0.62%
Illinois	51,600	3.62%	$355,892,454.23	3.57%
Indiana	30,888	2.17%	$209,366,566.47	2.10%
Iowa	16,559	1.16%	$111,436,693.36	1.12%
Kansas	13,789	0.97%	$93,832,540.07	0.94%
Kentucky	19,184	1.35%	$132,404,006.84	1.33%
Louisiana	21,733	1.53%	$149,875,454.73	1.50%
Maine	5,061	0.36%	$34,711,786.83	0.35%
Maryland	23,679	1.66%	$164,928,641.43	1.65%
Massachusetts	25,029	1.76%	$171,707,227.09	1.72%
Michigan	55,066	3.87%	$361,953,001.54	3.63%
Minnesota	28,758	2.02%	$199,985,799.29	2.00%
Mississippi	15,152	1.06%	$104,279,285.08	1.05%
Missouri	30,072	2.11%	$207,502,200.17	2.08%
Montana	4,257	0.30%	$29,513,100.13	0.30%
Nebraska	10,167	0.71%	$71,000,370.19	0.71%
Nevada	20,222	1.42%	$146,661,682.78	1.47%
New Hampshire	5,149	0.36%	$35,431,775.87	0.36%
New Jersey	30,366	2.13%	$208,252,417.60	2.09%

State	Number of Credits Claimed	Percent of Total	Amount of Credits Claimed	Percent of Total Amount Claimed
New Mexico	7,281	0.51%	$51,537,496.21	0.52%
New York	50,380	3.54%	$339,170,763.02	3.40%
North Carolina	44,847	3.15%	$320,459,722.19	3.21%
North Dakota	2,654	0.19%	$17,779,366.06	0.18%
Ohio	48,671	3.42%	$325,696,178.43	3.27%
Oklahoma	19,570	1.37%	$133,428,216.02	1.34%
Oregon	14,182	1.00%	$100,461,868.56	1.01%
Pennsylvania	53,508	3.76%	$366,222,719.01	3.67%
Rhode Island	4,165	0.29%	$29,537,675.15	0.30%
South Carolina	21,957	1.54%	$154,507,294.13	1.55%
South Dakota	3,330	0.23%	$22,551,737.29	0.23%
Tennessee	35,892	2.52%	$256,422,528.49	2.57%
Texas	131,411	9.23%	$931,046,064.09	9.33%
Utah	17,534	1.23%	$129,356,648.40	1.30%
Vermont	2,097	0.15%	$14,157,937.93	0.14%
Virginia	40,527	2.85%	$286,986,383.51	2.88%
Washington	26,568	1.87%	$189,005,492.70	1.89%
West Virginia	5,563	0.39%	$36,380,376.18	0.36%
Wisconsin	24,649	1.73%	$170,765,960.35	1.71%
Wyoming	2,807	0.20%	$19,666,599.99	0.20%
Other	661	0.05%	$4,708,574.64	0.05%
Total	**1,424,212**	**100.00%**	**$9,974,923,628.57**	**100.00%**

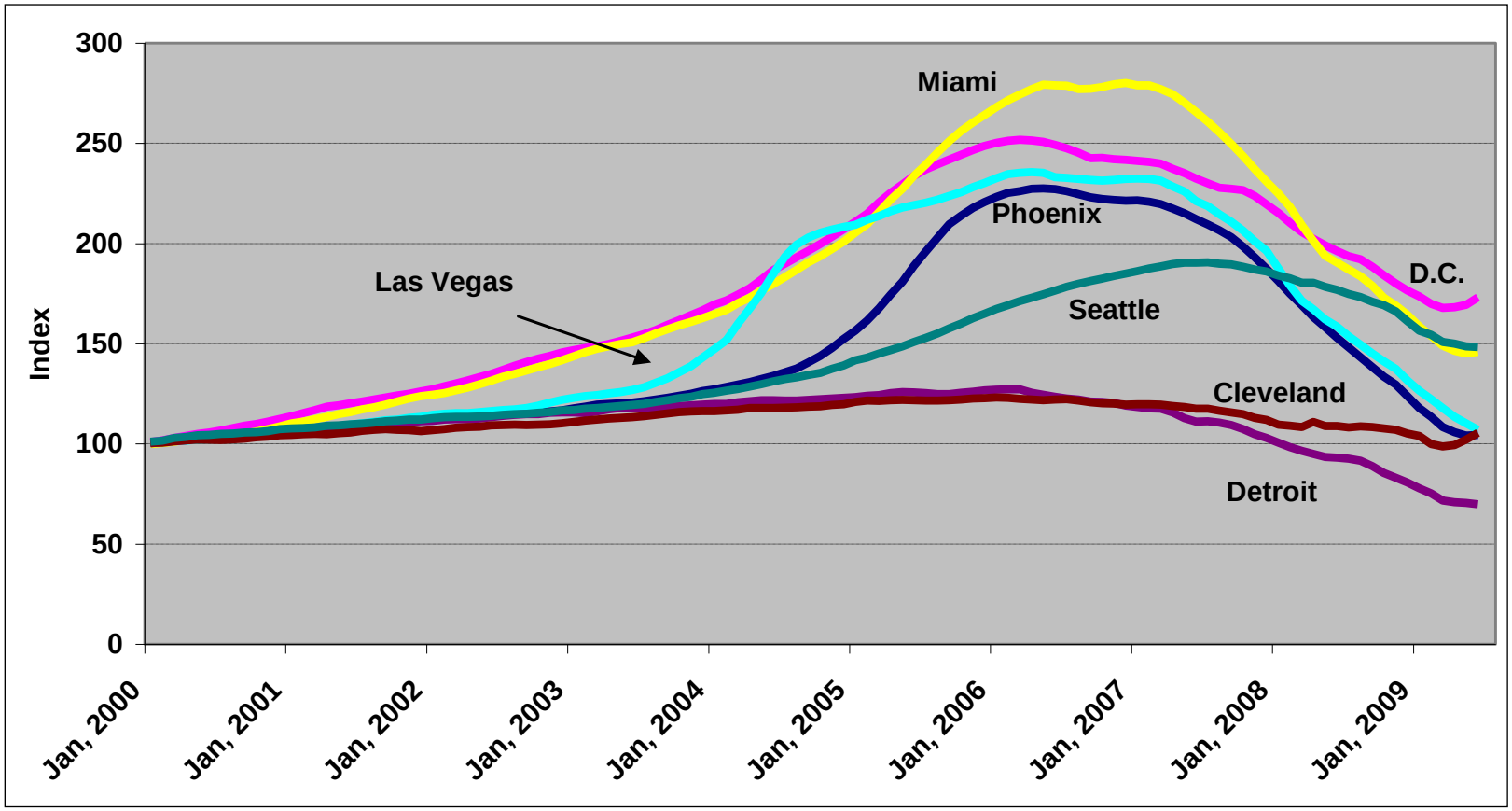
Source: Internal Revenue Service.

Notes: Figures report tax credits claimed for 2008 and 2009 purchases as of 8/24/2009.

Appendix B. Regional Home Prices

Figure B-1. S&P Case-Shiller Regional Home Price Indices

January 2000 to July 2009

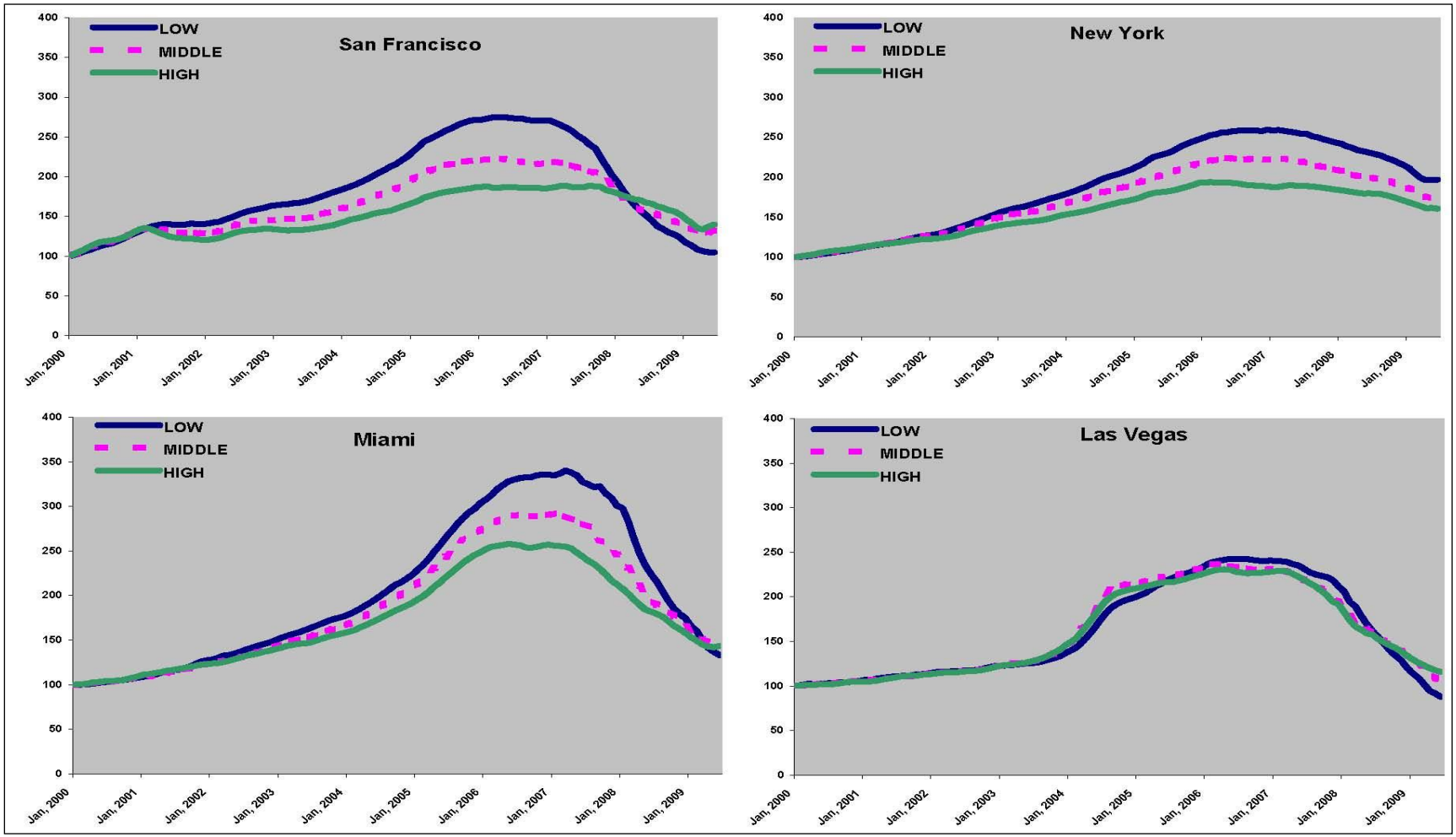


Source: Standard and Poor's, http://www2.standardandpoors.com/spf/pdf/index/SA_CSHomePrice_History_092955.xls.

Appendix C. Home Prices By Price Tier

Figure C-1. S&P Case-Shiller Regional Home Price Indices by Price Tier

January 2000 to July 2009



Source: Standard and Poor's, http://www2.standardandpoors.com/spf/pdf/index/SA_cs_tieredprices_092955.xls.

Appendix D. Estimated Reduction In Mortgage Payment Assuming Lower Initial Price

Table D-1. Estimated Reduction In Mortgage Payment from Home Prices, Mortgage Rates, and the Homebuyer Tax Credit

2008 HERA Tax Credit ($7,500 repayable)	**Median Home Price** (Feb 2009)	**Price Effect** Average (-11%)	**Mortgage Rate Effect** (6.22% to 6.43%)	**Tax Credit Effect** ($7,500)	**Total Effect:**
Home Price	$168,200	$149,827	$168,200	$166,096	$147,723
Monthly Mortgage Payment	$1,032	$920	$1,055	$1,019	$9,27
Reduction in Monthly Payment		$113	-$23	$13	$105
Reduction in Annual Payment		$1,353	-$277	$155	$1,265

2009 ARRA Tax Credit ($8,000 non-repayable)	**Median Home Price** (Feb 2009)	**Price Effect** Average (-19%)	**Mortgage Rate Effect** (6.22% to 5.15%)	**Tax Credit Effect** ($8,000)	**Total Effect:**
Home Price	$168,200	$135,997	$168,200	$160,200	$127,997
Monthly Mortgage Payment	$1,032	$835	$916	$983	$697
Reduction in Monthly Payment		$198	$116	$49	$335
Reduction in Annual Payment		$2,372	$1,392	$589	$4,020

Source: CRS calculations.

Appendix E. Method for Estimating Additional Home Purchases

This appendix outlines the assumptions, data, and methods used to estimate the number of additional home purchases attributable to the ARRA and WHBAA homebuyer tax credits. The first step in the estimation was to determine the number of home purchases that would have occurred without the homebuyer tax credit. This number was then adjusted upward to account for the increase in first-time home buying activity.

It was assumed that the number of home purchases that would have occurred absent the tax credit was simply equal to the total number of home purchases in 2008. The NAR reports that there were 4,913,000 existing home purchases in 2008, while the Census Bureau reports that there were 485,000 new home purchases in 2008.[30] Thus, the total number of home purchases in 2008 was 5,398,000. Historically, first-time buyers have represented about 40% of annual home purchases. Therefore, in 2008 it was estimated that there were 2,159,200 first-time home purchases (40% × 5,398,000), and 3,238,800 repeat home purchases.

Next, the price reduction induced by the homebuyer tax credit was calculated. The ARRA homebuyer tax credit was enacted in February 2009. According to the NAR, the median existing home price at this time was $168,200. This implies that the ARRA homebuyer tax credit effectively reduced the purchase price of a home by 4.76% ($8,000/$168,200). The WHBAA homebuyer tax credit was enacted in November 2009. Home price data had not been released at the time this report was originally authored. Using the median home price in October ($218,000), however, the WHBAA tax credit was estimated to reduce the purchase price for a first-time buyer by 3.67% ($8,000/$218,000) and by 2.98% ($6,500/$218,000) for repeat buyers. Note, for simplicity it was assumed that the median first-time and median repeat buyer purchased homes worth identical prices

Given an assumption about how responsive buyers were to these price reductions, an estimate can be formed about the annual increase in home purchases. A buyer's responsiveness to price changes is captured by the price elasticity of demand. The estimates in the body of the report assumed a range -0.5 to -1.5 for the price elasticity of demand. The elasticity multiplied by the tax credit induced price reduction indicates the percentage increase in home purchases that can be attributable to the tax credit, which can then be used to adjust annual homes purchases upward. As a result, the increase in annual first-time purchases attributable to the ARRA tax credit was estimated to be between 51,348 and 154,045 (elasticity × -4.76% × 2,159,200). The increase in annual first-time purchases attributable to the WHBAA tax credit was estimated to be between 39,600 and 118,801 (elasticity × -3.67% × 2,159,200), while the increase in annual repeat home purchases attributable to the WHBAA credit was estimated to between 48,263 and 144,788 (elasticity × -3.67% × 3,238,800). Thus, the WHBAA tax credit was estimated to result in 87,863 to 263,589 additional home purchases.

Lastly, these annual increases in home purchases were adjusted for the fact that the tax credits were or are not available for a full year. The ARRA tax credit was enacted in February and was set to expire December 1, 2009. So the annual increase in first-time purchases attributable to the ARRA tax credit was multiplied by 10/12. Likewise, the WHBAA tax credit was enacted in November 2009 and is set to expire July 1, 2010. Thus, the annual increase in home purchases

[30] Census: http://www.census.gov/const/quarterly_sales.pdf; NAR: http://www.realtor.org/wps/wcm/connect/d543f080400816579965fd205f470b6e/REL0909EHS.pdf?MOD=AJPERES&CACHEID=d543f080400816579965fd205f470b6e

attributable to the WHBAA tax credit was multiplied by 7/12. Doing so produces the results reported in **Table 3**.

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