What are the impacts of the home buyer's tax credit on housing and the economy?

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ABSTRACT

Homeowners lost close to $7 trillion in housing equity from the peak of the housing market in 2006 to the end of 2009. This recent downturn in the U.S. housing market helped create the worst downturn in the U.S. economy since the great depression. To help stabilize the housing market and the U.S. economy, Congress and the President passed The Housing and Economic Recovery Act of 2008 (HERA of 2008), which provided a new refundable tax credit for first-time homebuyers of a principal residence of $7,500 in the United States. In 2009, this tax credit was increased to $8,000 and extended to non first-time homebuyers who could claim a credit of up to $6,500. While this tax credit may have been helpful in stimulating the demand for homes, there was a significant fall in housing demand as soon as it ended. Thus, it is unclear if the tax credit may have just altered the timing of when someone decided to buy a home, or the decision whether to buy a home. This paper examines the impacts of the tax credit on housing and its impact on the overall economy measured as GDP. Specifically, a Cusum Squares test is employed to determine whether the housing tax credit created a structural break in the price of housing, quantity of housing, income and GDP.

Keywords: Housing, Tax Policy, Tax Credit, Macroeconomics

INTRODUCTION

Homeowners lost close to $7 trillion in housing equity from the peak of the housing market in 2006 to the end of 2009. During this time period, total U.S. mortgage debt was close to $14 trillion, with Fannie Mae and Freddie Mac both having close to $5 trillion in debt. The fall in house prices ended the housing bubble, hurting homeowners, especially those who purchased at the peak of the housing market or did cash-out refinances.

To better understand the magnitude of the shocks to the housing market data, Tables 1 and 2 show the sharp increase followed by the extreme downturn in housing market. Table 1 shows the median sales prices, from 1996 to the end of 2011. Graph 1 shows that between 1997 and 2006, the median house price increased by 125% with a peak in March 2007 at $262,600. This was followed by the quick downturn, which bottomed in March 2009 at $214,500. Median prices also fell by close to $20,000 as soon as the homebuyer's tax credit expired (as did average home prices). Similarly, the fall in housing starts was even more extreme, falling from its peak of 2,207,000 in February 2005 to 478,000 in April 2009. There was also a similar fall after the expiration of the housing tax credit of 30,000 units

Home wealth also impacts the broader economy. Strong home wealth preservation helps stabilize an economy and encourage an economic recovery as consumers feel more comfortable about their wealth situation and greatly improve bank balance sheets. Thus, it may not only be the real estate market that benefits from a homebuyer's tax credit, but other sectors benefit indirectly as well. Close to 40% of all existing home sales are from first time home buyers. Once a first time home buyer purchases a home, they also purchase new furniture, kitchen appliances, etc., creating spillover effects in other sectors, which can speed up a recovery. Close to 10% of all construction and manufacturing is related to homes. This is why the housing market typically plays a big role as the economy exits from recession, with a rebound in new home building sparking demand for construction workers and building supplies. Stability of the housing market is an important factor in the confidence of America's 75 million homeowners who have a significant amount of net worth invested in their home.

To help stabilize the housing market and end its free fall, our government passed a number of Acts offering incentives to home buyers of a principle residence in the United States (vacation homes and rental properties are excluded). The first measure was embodied in The Housing and Economic Recovery Act of 2008 (HERA of 2008) providing a new refundable tax credit for first-time homebuyers of a principal residence in the U.S. The residence must have been purchased between April 9, 2008 and December 31, 2008, and the maximum credit was $7,500. The American Recovery and Reinvestment Act of 2009 (ARRA of 2009), modified the credit for qualified purchases effective January 1, 2009 through November 30, 2009, increasing the maximum credit to $8,000. The 2009 Worker, Homeownership and Business Assistance Act (WHBAA of 2009), updated the 2009 changes for qualified purchases made after November 6, 2009 as follows: (1) by extending the home purchase date and allowing qualified taxpayers to enter into a binding contract before May 1, 2010 to purchase the property before July 1, 2010; (2) expanding the credit to allow long-time residents who owned and used the same principal residence for any 5 consecutive years of the last 8 years prior to purchasing a new principal residence to now qualify for a tax credit of up to $6,500; and (3) income limitations increased. The Homebuyer Assistance and Improvement Act of 2010 (HAIA of 2010), extended the closing deadline from June 30 to Sept. 30 for eligible homebuyers who entered into a binding purchase contract on or before April 30. Key provisions of these Acts are summarized in Table 1.

The tax credits, however, are very costly. According to the IRS, the overall estimated cost of the tax credit in 2009 and 2010 was close to $26 billion, which is much more the original budget for the program. The Real Estate industry argued that this tax credit has been vital to the recovery of the real estate market. While the cost of the tax credit is clear, what is not clear is whether it encouraged more people to buy a home or if it just altered the timing of buying a home. Some economists projected that without the tax credit, a further 10-15 percent decline in home values that would have been another $1.5 to $2 trillion in wealth destruction for home owning families. Many estimate that the home buyer tax credit helped to preserve about $21,000 on average for each homeowner. In contrast, according to Michael Kraus, the Brooking Institute estimates that only 15 percent of people who took advantage of the tax credit said it was their primary motivator for purchasing a home. Using survey data, Stan Humphries estimates that the impact of extending the $8000 to new home buyers alone could have a total cost of $14.86 billion and that it helped to spur an 334,000 sales (sales that would not have occurred without the credit; and four of five sales of homes to first-time homebuyers would have occurred regardless.)

According to the National Association of Realtors (NAR) and the National Association of Home Builders (NAHB), close to 1.8 million people took advantage of the first-time homebuyer tax credit, and estimated that it increased home sales between 165,000 to 300,000 homes. Data from the NAR in August shows that after the tax credit ended, existing-home sales dropped 27.2 percent to a seasonally adjusted annual rate of 3.83 million units in July, which is down from 5.26 million in June. This is 25.5 percent below the 5.14 million-unit level in July 2009. Similarly, the purchase index from the Mortgage Bankers Association shows a fall every week in May home sales, which is down 20 percent from April, when the initial tax credit ended. This may be due to people trying to buy homes before the tax credit ended, thus creating a significant fall in demand after the tax credit expired.

Not only have home sales severely fallen since the tax credit ended, prices are also decelerating. U.S. home prices, posted a 1.7% increase from 2009, but the gains decelerated sharply towards the end of the government tax credit, with 12 of 20 cities posting a year-over-year decline, according to the October 2010 Case Schiller report. According to a report by the National Association of Realtors, it would take nearly 10.7 months to sell the nation's inventory of 4.04 million homes at the current sales price. Six to eight months of inventory is considered healthy. This paper examines the impacts of the tax credit on the quantity and price of housing, as well as the time it takes to sell a home, and the tax credit's impact on income and the overall economy measured as GDP.

ESTIMATION TECHNIQUE AND DATA

To empirically examine the impacts of the housing tax credit on the housing market, this paper regresses housing prices, starts, and the length of time to sell a house on the housing tax credit controlling for other factors. All data is obtained from the St. Louis Federal Reserve FRED website, from 1996.01 to 2011.11.

Specifically, this paper estimates:

$$Housing = \alpha + \beta_P(P) + \beta_C(t_C) + \beta_r(r) + \beta_i(I) + \beta_U(U) + \varepsilon_i$$

where Housing is first measured as the housing value using starts, new sales, and residential

investment regressed on *P* which is housing prices, t_c is the homeowners tax credit, which is a dummy variable for the quarters that they tax credit was law, r is long-term interest rates, *I* is income, and *U* is the unemployment rate, α and β 's are parameters to be estimated, and ε_i is an error term. Second, this equation is re-estimated interchanging housing prices and quantity to determine the impact of the tax credit on the price of housing. Third, the paper estimates the above equations using in natural logs to measure the impacts on the change in housing prices, quantity, interest rates and income. Lastly, this paper examines the ratio of homes for sale relative to that of the number of homes that have sold, to approximate how many months that it takes to sell a home. To determine the impact of the home buyer's tax credit on income and the overall economy, the following equation is estimated:

$$Income = \alpha + \beta_P(P) + \beta_C(t_C) + \beta_r(r) + \beta_H(Housing) + \beta_U(U) + \varepsilon_i$$

Next, this study determine whether there is a significant structural change in housing prices and quantity associated with the time periods before and after the tax credit. To do this, Cu sum-of-Squares tests (which stands for cumulative sum of the least squares recursive residuals) for housing prices and starts are estimated. Green (1997) argues that a cusum-of-squares test is appropriate if uncertainty exists regarding when a structural change might exist. According to Greene (2000), one advantage of this test is that is does not require a prior specification of when the structural change takes place as a Chow test does. In general, this test plots the variable over time and its 5 percent critical values. Any movement outside the critical lines suggests the parameter or its variance is no longer stable. This test, developed by Brown, Durbin, and Evans (1975), has a null hypothesis that the coefficient vector β is the same in every period, while the alternative is that β (or the disturbance variance) is not the same in every time period.

ESTIMATION RESULTS

Results suggest that the tax buyer's tax credit had very little impact on the price and quantity of homes. Surprisingly, Table 2 column 2 shows that the homebuyer's tax credit has a positive but insignificant impact on the median price of houses. Similarly, Table 2 shows that the home buyer's tax credit also has a positive but insignificant impact on the percentage change in the price of median homes as well. This may be due to other stronger influences overwhelming the impact of the homebuyer's tax credit.

Some of these other forces include unemployment and disposable income. Results show that unemployment has a strong negative and statistically significant impact on housing. Similarly, disposable income has the expected positive statistically significant impact on housing prices and the percent change in housing prices as well. Surprisingly, interest rates have a positive impact on prices. While this is contradictory to expectations, it may be that the fall in housing prices prompted the Federal Reserve Bank to react and reduced interest rates.

The homebuyer's tax credit also appears to not have a strong impact on housing starts or the percent change in starts. In fact, the tax credit has a surprising negative impact on housing start. This may be a timing issue. Home builders may have expected the credit to be implemented and had already built up the housing stock before the home buyers tax credit became law. By time the tax credit was in effect, house sales may actually have gone up, but construction of new houses which takes several months may have fallen.

Interestingly, interest rates and unemployment have the expected strong negative impacts on housing starts and the percentage change in starts, but disposable income has a small and negative impact on housing starts. This relates to the extreme increase in housing values and starts during the late 1990s and early 2000s that corresponded to very little increases in income. Results are very similar if we use the quarterly residential fixed investment data.

Cusum Square results in Figures 3 and 4 suggest that housing prices and quantities had a structural break during the run up in the prices in the early 2000s, which corrected itself back to normal in 2007. This suggests that it is the tremendous increases in housing market that was not sustainable, and that the sharp downturn is closer to housings actual norm. In fact, results suggest that housing is back to normal and thus may have been experiencing a self correction since 2007.

While the home buyer's tax credit does not appear to have a significant positive impact on housing prices, starts, and residential investment, the tax credit does have a strong positive and significant impact on the ratio of homes for sale relative to the homes sold. Results in Table 3 show that the homebuyer's tax credits impact on reducing the time it takes homes to be sold is quite large, reducing the time a house is on the market by over a month. As expected, an increase in unemployment and housing starts increases the time it takes to sell a home, while an increase in income reduces the time it takes to sell a home. Thus, while the homebuyer's tax credit may not have a significant impact on the quantity and the price of home sales, it does help reduce the time it takes to sell a home.

Similarly, Table 3 also shows that the homebuyer's tax credit also helps to increase personal income and overall GDP. Results show that the tax credit has a large and positive impact on personal income and GDP. This is probably due to the tax credit directly increasing the after tax income for first time home buyers and thus may also increase consumption, which in turn increases GDP. Thus, will the tax credit may not directly help stabilize housing, it may indirectly help to stabilize income and the overall economy, which then indirectly helps to stabilize housing.

CONCLUSIONS

The housing market took a sharp downturn at the end of 2007, which soon after created the biggest recession in the United States since the Great Depression. In response, to help stabilize the housing market and the overall economy, the President and Congress enacted an expansion of the homebuyer's tax credit in 2008. The IRS paid $26 billion in home buyer's tax credits in 2009 and 2010. Results of this paper suggest that while the home buyer's tax credit was expensive and did not have a significant positive impact on the price and quantity of homes sold, it did have a large and positive impact on the length of time it takes to sell a home, income and GDP. Thus, the tax credit appears to have helped to stabilize income and the overall income, which also then indirectly helped to stabilize the housing market.

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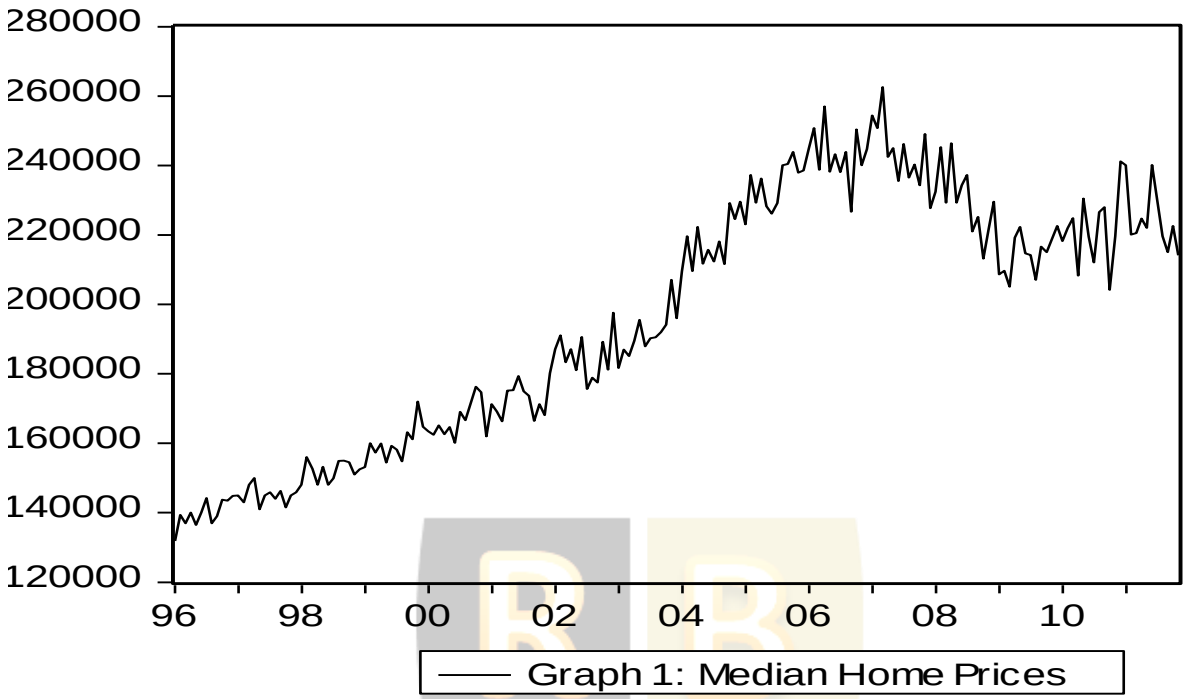
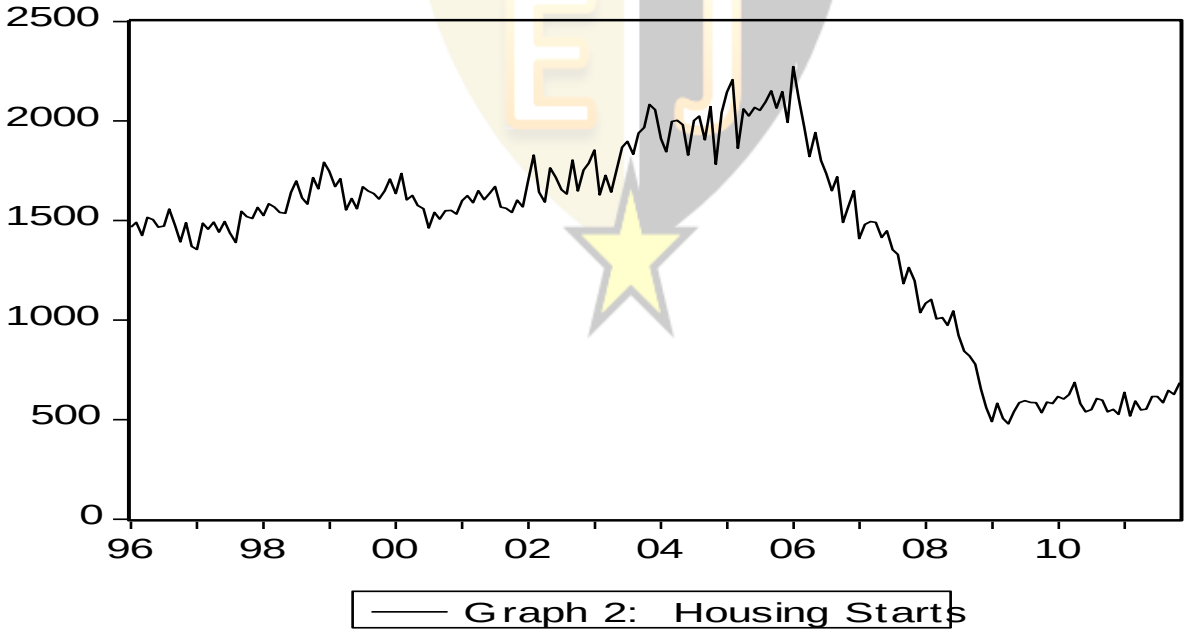
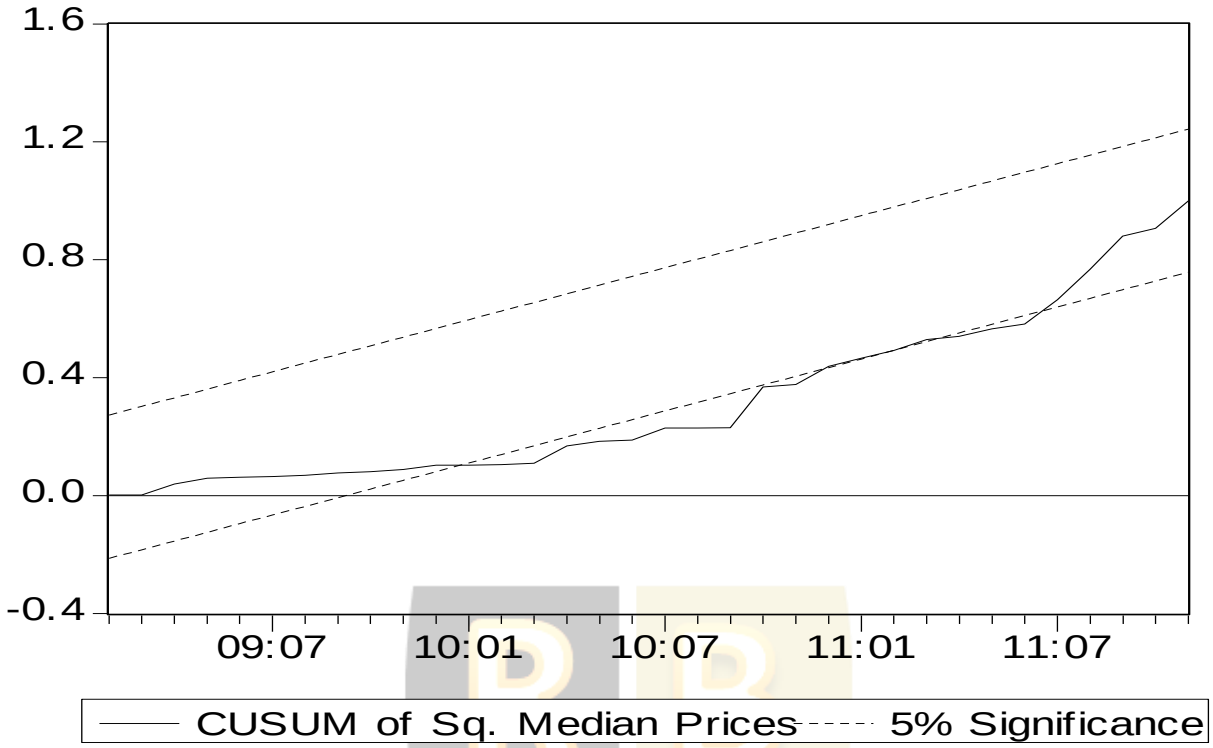
APPENDIX 1: GRAPHS



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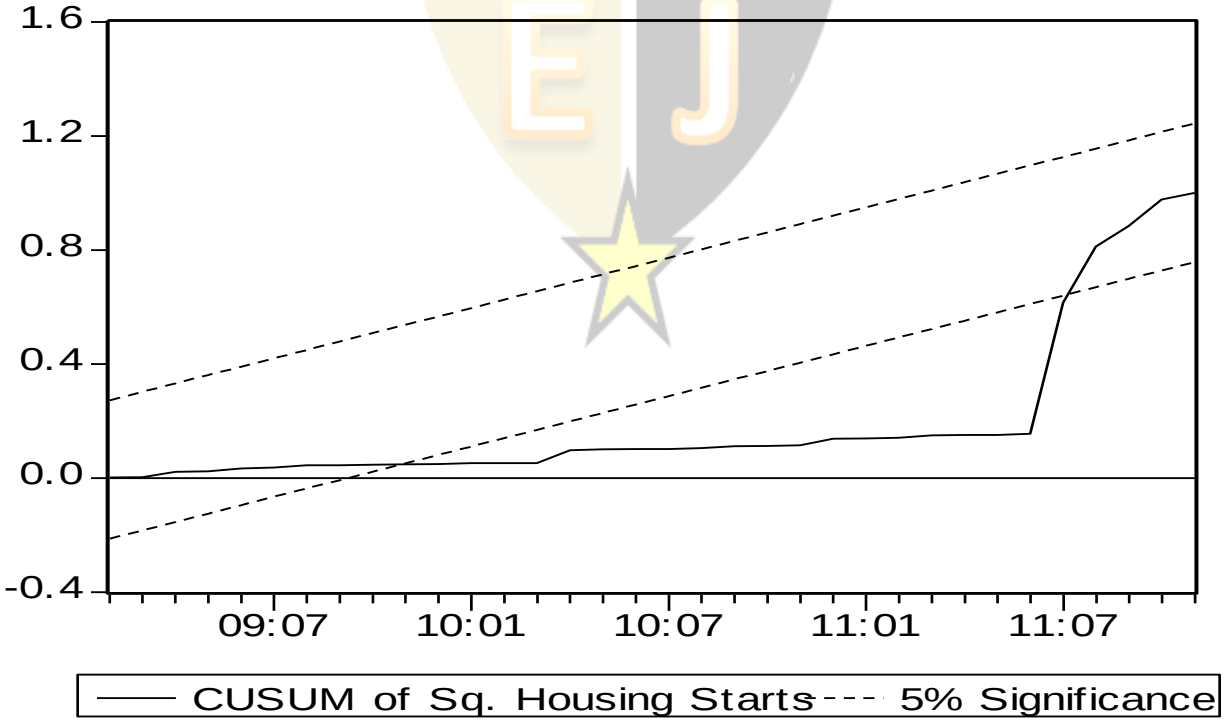
11:07
CUSUM of Sq. Median Prices
5% Significance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11:07
CUSUM of Sq. Housing Starts
5% Significance

APPENDIX 2: TABLES

Table 1				
Act ---→	**HERA of 2008**	**ARRA of 2009**	**WHBAA of 2009**	**HAIA of 2010**
Eligible Taxpayer	First-time home buyer	First-time home buyer	First-time home buyer AND Long-time residents	First-time home buyer AND Long-time residents
Principal residence purchased	April 9, 2008 – December 21, 2008	January 1, 2009 - November 30, 2009	As of 11/7/2009, purchase date extended, allowing taxpayers to enter into a binding contract by 5/1/2010 to purchase the property by 7/1/2010	July 1, 2010 date from WHBAA extended to September 30, 2010
Amount of credit	10% x purchase price with a maximum credit of $7,500 or $3,750 for MFS taxpayers	10% x purchase price with a maximum credit of $8,000 or $4,000 for MFS taxpayers	10% x purchase price with a maximum credit: (1) for first-time homebuyers - $8,000 or $4,000 for MFS taxpayers; (2) $6,500 for long-time residents	10% x purchase price with a max. credit: (1) for first-time homebuyers - $8,000 or $4,000 for MFS taxpayers; (2) $6,500 for long-time residents
Recapture of credit	Credit is an interest free loan as it must be repaid evenly over 15 years	Credit doesn't have to be repaid if the home remains the taxpayer's main home for 36 months	Credit doesn't have to be repaid if the home remains the taxpayer's main home for 36 months	Credit does not have to be repaid provided the home remains the taxpayer's main home for 36 months
Modified Adjusted Gross Income (MAGI) Limit	$75,000 or $150,000 for joint filers	$75,000 or $150,000 for joint filers	$125,000 or $225,000 for joint filers	$125,000 or $225,000 for joint filers
Purchase price limitation		$800,000	$800,000	$800,000

Table 2: Ordinary Least Squares Regression with (Standard Errors in Parentheses) Results for:				
	Median Prices	Starts	Log(Median)	Log(Starts)
Constant	-62917.516**	3834.851**	1.735463**	3.541600**
	(22342.98)	(389.8943)	(0.394548)	(1.444080)
Median Prices		0.013593**		2.121659**
		(0.001246)		(0.214586)
Housing Starts	29.98032**		0.170174**	
	(2.748384)		(0.017211)	
Interest Rates	3003.185**	-191.9973**	0.054199**	-0.502962**
	(1613.526)	(31.47932)	(0.049975)	(0.172773)
Disposable Income	24.12295**	-0.373651**	0.035835**	-2.281291**
	(0.734080)	(0.031002)	(0.020439)	(0.230891)
Credit	5210.842	-323.6457**	0.035835	-0.403212**
	(3923.441)	(80.28036)	(0.020439)	0.066040
Unemployment	-2310.903**	-91.25651**	-0.003274**	-0.089771**
	(1114.450)	(22.99936)	(0.005780)	0.019254
R-Square	0.947007	0.86642	0.955049	0.895059
Adjusted R-Sq.	0.945476	0.862599	0.953750	0.892026
** statistically significant at the 5% level				

Table 3: Ordinary Least Squares Regression with (Standard Errors in Parentheses) Results for:				
	Income	GDP	RFI	HS – Ratio of homes
Constant	24099.59**	4994.087**	-104271.90**	2.908124
	(1409.334)	(301.2156)	(1.57E-06)	(2.558279)
Housing Starts	-1.082430**	-47.72144**		-0.002445**
	(0.271710)	(15.73085)		(0.000315)
Income				0.000691**
				(8.41E-05)
Interest Rates	-1692.058**	0.000292**	957.4029**	0.365123**
	(106.3568)	(5.96E-06)	(1.04E-07)	(0.184749)
Credit	1184.931**	922.0741**	6263.172**	1.029099**
	(395.0979)	(205.8696)	(3.27E-07)	(0.449235)
Unemployment	-574.2597**	-116.9058**	2850.779**	-0.4102541**
	(106.5399)	(31.93683)	(6.94E-08)	(0.127605)
Average Prices			106.0336**	
			(4.30E-12)	
GDP			23.05718**	
			(1.72E-10)	
R-Square	0.782154	0.977938	0.977637	0.740289
Adjusted R-Sq.	0.777146	0.977316	0.977007	0.732783
** statistically significant at the 5% level				