

# Did Affordable Housing Legislation Contribute to the Subprime Securities Boom?

Rubén Hernández-Murillo (FRB St. Louis)  
Andra C. Ghent (Baruch College)  
Michael T. Owyang (FRB St. Louis)

Federal Reserve Bank of Cleveland Policy Summit on Housing,  
Human Capital, and Inequality  
June 28th, 2012

## Usual Disclaimer

The views expressed are those of the individual authors and do not necessarily reflect official positions of the Federal Reserve Bank of St. Louis, the Federal Reserve System, or the Board of Governors

# Motivation

Michael Bloomberg (2011):

*It was not the banks that created the mortgage crisis. It was, plain and simple, Congress who forced everybody to go and give mortgages to people who were on the cusp.*

...

*But they were the ones who pushed Fannie and Freddie to make a bunch of loans that were imprudent, if you will.*

## Motivation

Alan Greenspan (2010):

*An even heavier demand was driven by the need of Fannie Mae and Freddie Mac, the major U.S. government-sponsored enterprises (GSEs), pressed by the Department of Housing and Urban Development and Congress to meet expanded “affordable housing goals.” Given the size of the GSEs’ expanded commitments to fund low- and moderate-income housing, they had few alternatives but to invest, wholesale, in subprime securities.*

## Motivation

Raghuram Rajan (2010):

*The tsunami of money directed by a U.S. Congress, worried about growing income inequality, towards expanding low income housing, joined with the flood of foreign capital inflows to remove any discipline on home loans.*

Charles Calomiris (2009):

*The politicization of Fannie Mae and Freddie Mac and the actions of members of Congress to encourage reckless lending by the GSEs in the name of affordable housing were arguably the most damaging policy actions leading up to the crisis.*

# This Paper

We evaluate whether the Community Reinvestment Act (CRA) and the GSEs' Affordable Housing Goals contributed to the boom in subprime securities boom using a regression discontinuity approach

We find that neither set of policies altered the number of originations, the pricing, or default rates of mortgages securitized in private label MBS (PLMBS)

# Community Reinvestment Act

- 1977 Act
- Encourages depository institutions to provide credit to low-income communities and low-income households
- Assessed by four different agencies: FDIC, FRS, OCC, or (now defunct) OTS
- Regulators look at a depository institution's CRA compliance record when deciding whether an institution can expand

# Community Reinvestment Act

- Lenders get credit for loans made to either of the following populations:
  1. Households that live in Census tracts that have median income of 80% or less of MSA median income (CRA1)
  2. Households with income of 80% or less of MSA median income (CRA2)

## GSEs' Affordable Housing Goals

- Created by 1992 GSE Act
- Mandates that GSEs do a certain percentage of their lending to target populations
- Annual targets for each goal set yearly by Congress

# GSEs' Affordable Housing Goals

The goals:

## 1. Underserved Areas Goal (UAG)

- UAG1: Loans to borrowers living in Census tracts with a minority population of 30% or more and median tract to MSA income of 120% or less.
- UAG2: Loans to borrowers living in Census tracts with median tract to MSA income of 90% or less.

## 2. Special Affordable Goal (SAG)

- SAG1: Loans to borrowers with incomes of 60% or less of the median MSA income.
- SAG2: Loans to borrowers with incomes of 80% or less of the median MSA income and who live in Census tracts with median tract to MSA income of 80% or less.

## 3. Low and Moderate Income Goal (LMIG)

- Loans to borrowers with incomes of 100% or less of the median MSA income.

# Data

We combine mortgage data from two datasets for California and Florida originated during 2004-2006

- HMDA (Home Mortgage Disclosure Act)
- CL (CoreLogic)

We analyze all of the affordable housing goals including the borrower-specific ones

- CRA
- GSEs Affordable Housing Goals

## HMDA Data

- Publicly available data on most mortgages
- Borrower's race and ethnicity
- Limited information on borrower and loan characteristics
  - borrower's income
  - loan amount
  - loan type (conventional or government-insured)
  - loan purpose (purchase or refinance)
  - limited information on loan prices
  - property location (Census tract)
  - Census tract median income relative to metro area income
  - Census tract minority population share

# CL Data

- Proprietary data on loans securitized as nonprime
- Extensive information on loan characteristics
  - interest rate
  - mortgage type
  - loan terms (amortization scheme, rate reset period)
  - prepayment penalties
  - private mortgage insurance
  - property location (zip code)
  - dynamic information on default and prepayment

# Product Definitions

We focus our analysis on the most popular product in our data, 30 year ARMs

- First liens only
- Owner-occupied only

# Three Ways Goals Effect on Market may Manifest Itself

## 1. Did Goals Lead to More Loans?

- Look at whether there are more loans per capita in tracts that satisfy the affordable goals
- Appropriate only for the tract-specific goals (CRA1, UAG1, and UAG2)

# Three Ways Goals Effect on Market may Manifest Itself

## 2. Did Goals Lead to Cheaper Loans?

- Look at whether there are differences in the initial contract rates due to goals

# Three Ways Goals Effect on Market may Manifest Itself

## 3. Did Goals Lead to Laxer Underwriting Standards?

- Look at whether there are differences in default rates due to goals
- Definition of default is a 90-day delinquency, foreclosure, or REO (bank-owned) within two years of origination
- Estimate default using a Probit model
  - 1 = default within two years of origination

# Regression Discontinuity Approach

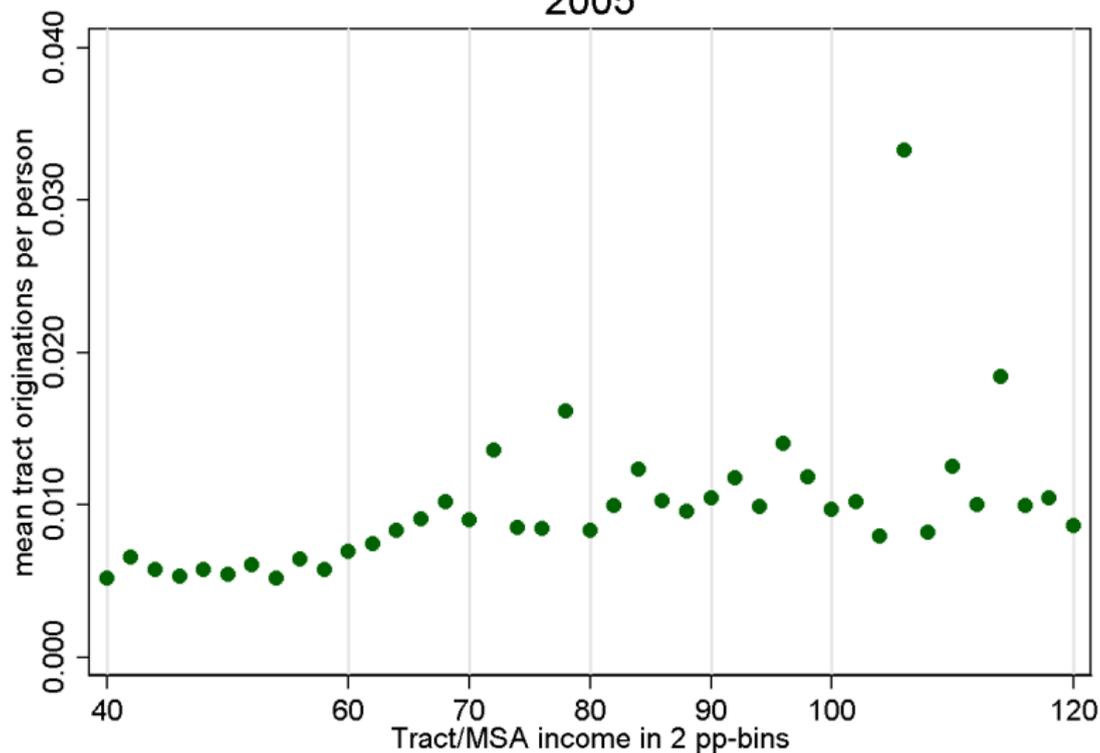
- All goals have discrete eligibility cutoffs
- Exploit cutoffs to identify effect of goals on outcomes
- E.g., CRA1:
  - Lenders get credit for loans made to borrowers living in census tracts with median income of 80% or less of MSA median income
  - If CRA1 has an effect, expect to see difference between census tracts with income right below 80% and right above 80%



# Originations by Tract Income

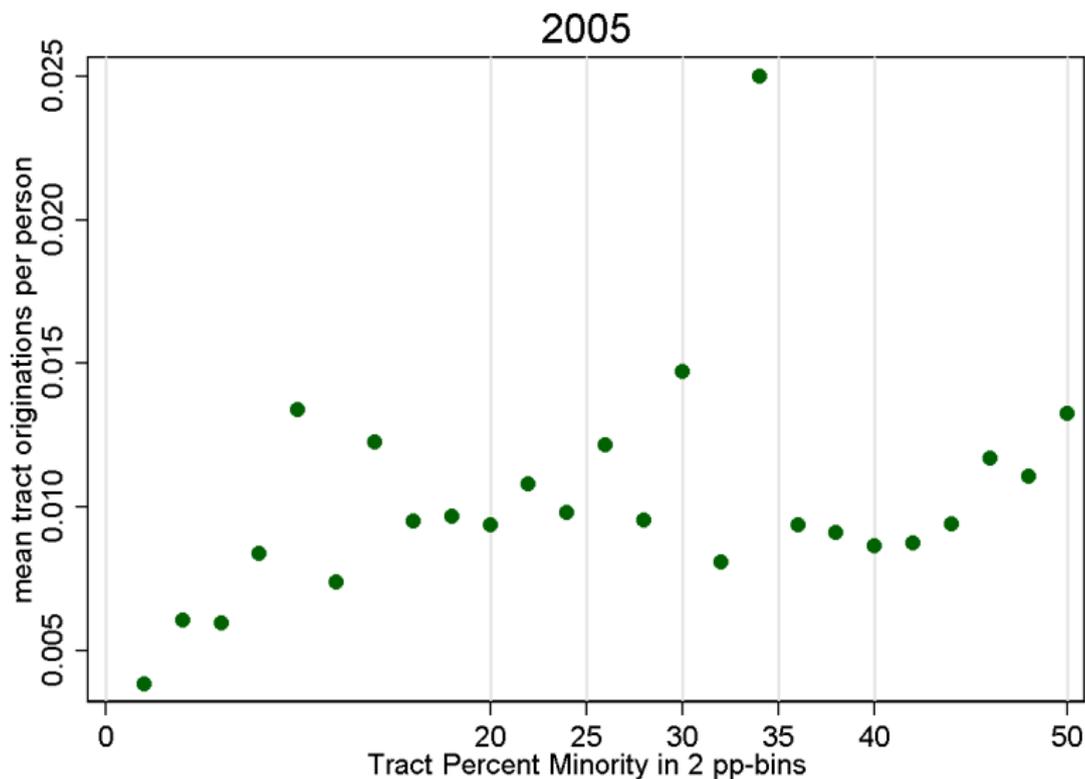
Discontinuity at 80% (CRA1) or 90% (UAG2)?

2005



# Originations by Tract Percent Minority

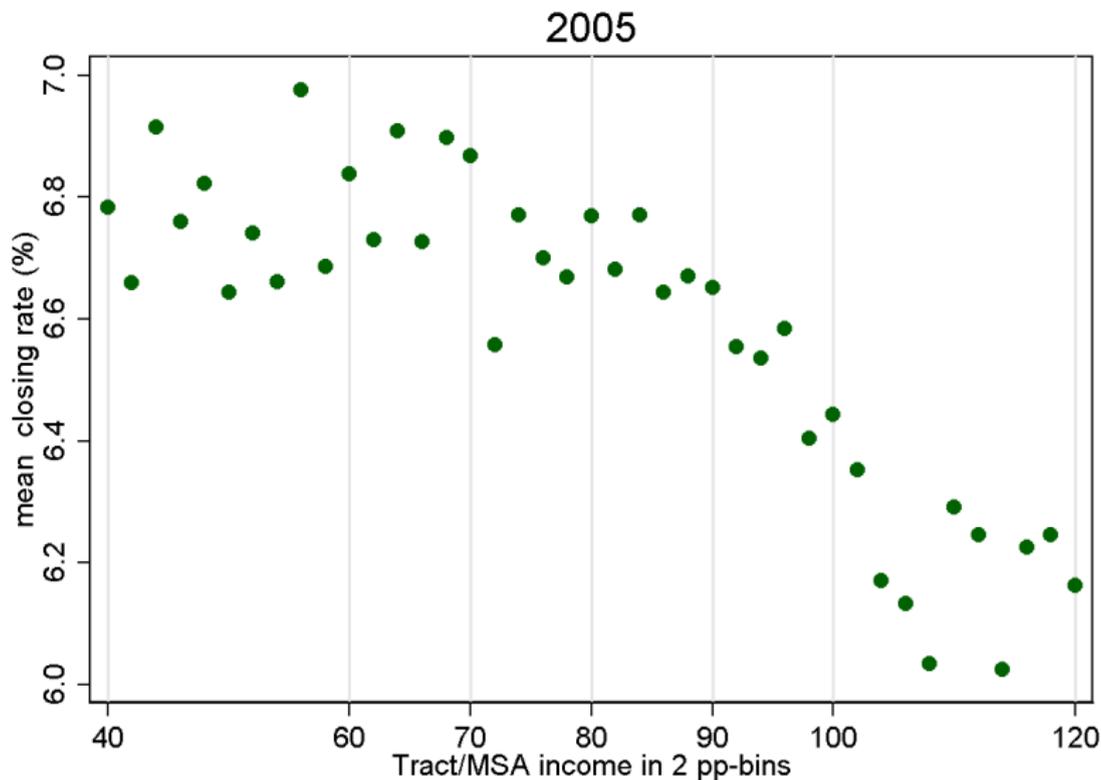
Discontinuity at 30% (UAG1)?





# Contract Rate by Tract Income of Borrower

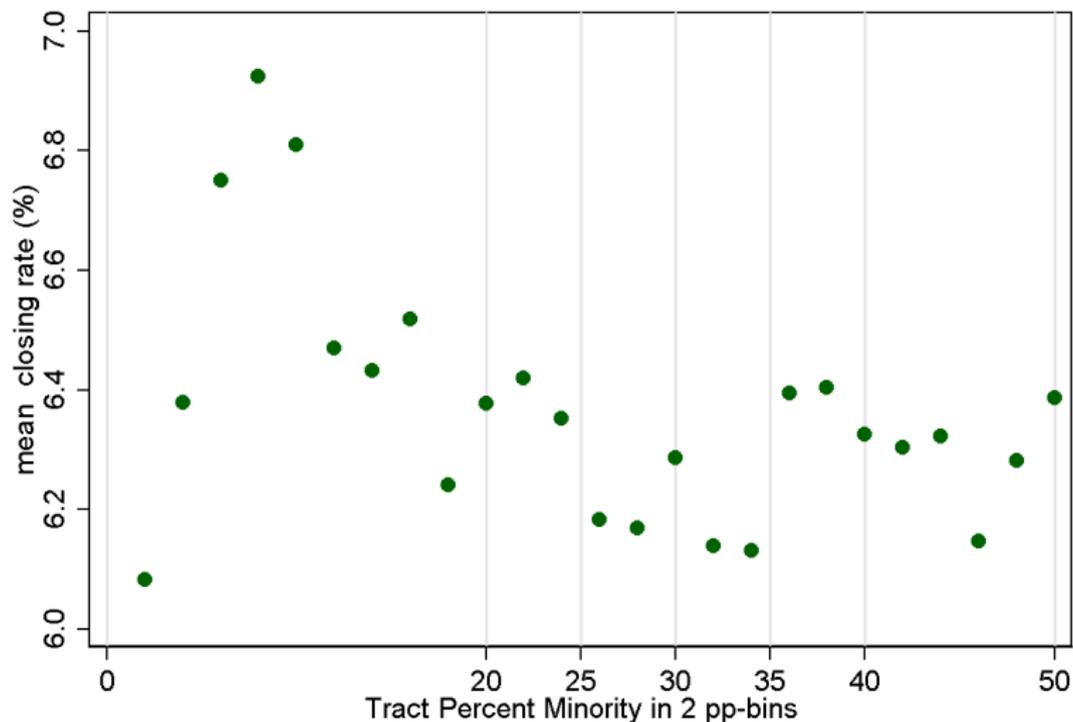
Discontinuity at 80% (CRA1) or 90% (UAG2)?



# Contract Rate by Tract Percent Minority of Borrower

Discontinuity at 30% (UAG1)?

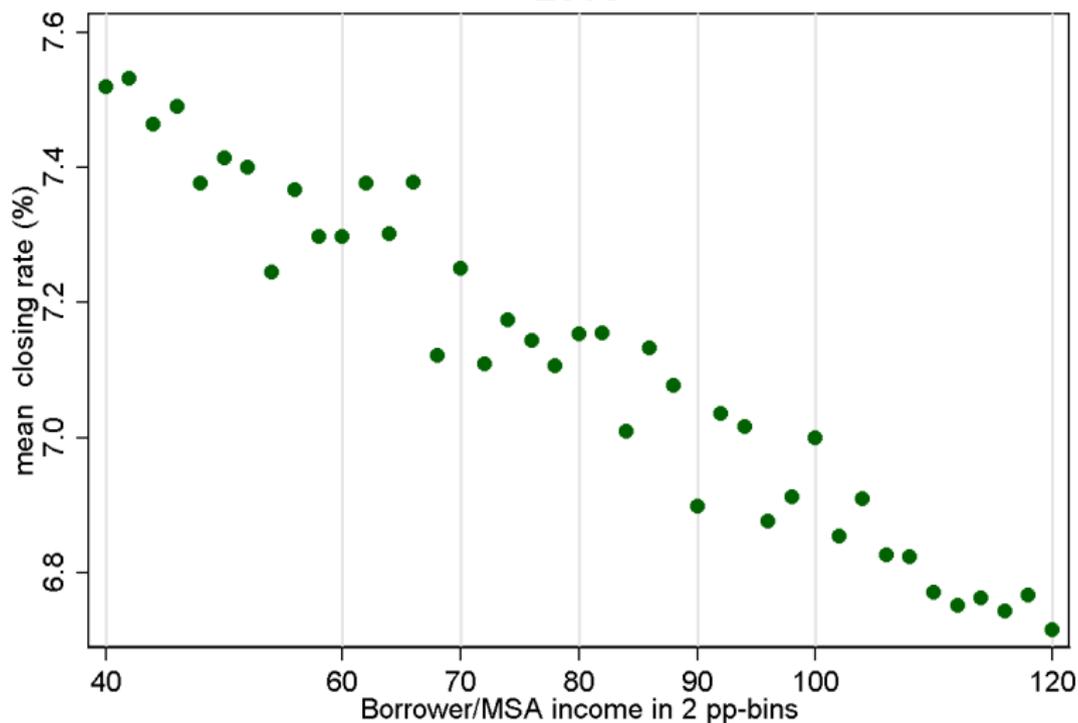
2005



# Contract Rate by Borrower Income

Discontinuity at 60% (SAG1), 80% (CRA2 and SAG2) or 100% (LMIG)?

2005





# Regression Results

## Originations per Tract

|                                      | Goal                | Tract             | Tract               | Year     | R-      | No. of |
|--------------------------------------|---------------------|-------------------|---------------------|----------|---------|--------|
|                                      | Dummy               | Income            | Percent             | Controls | Squared | Obs.   |
|                                      |                     |                   | Minority            |          |         |        |
| CRA1 (tract/MSA<br>income <=0.8)     | 0.00036<br>(0.65)   | 0.0085<br>(0.35)  | -                   | Yes      | 3.5%    | 1,547  |
| CRA1 (tract/MSA<br>income <=0.8)     | 0.00039<br>(0.70)   | 0.0105<br>(0.44)  | 0.0016***<br>(3.06) | Yes      | 4.1%    | 1,547  |
| UAG1 (tract minority<br>share >=0.3) | -0.00144<br>(-1.30) | -                 | -0.0215<br>(-0.44)  | Yes      | 2.3%    | 1,145  |
| UAG1 (tract minority<br>share >=0.3) | -0.00157<br>(-1.41) | 0.0028*<br>(1.69) | -0.0139<br>(-0.28)  | Yes      | 2.5%    | 1,145  |
| UAG2 (tract/MSA<br>income <=0.9)     | 0.00027<br>(0.46)   | 0.0152<br>(0.60)  | -                   | Yes      | 3.3%    | 1,399  |
| UAG2 (tract/MSA<br>income <=0.9)     | 0.00033<br>(0.57)   | 0.0165<br>(0.66)  | 0.0021***<br>(3.51) | Yes      | 4.2%    | 1,399  |



# Regression Results

## Rates, CRA

|                                    | Goal<br>Dummy     | Tract<br>Income   | Tract<br>Percent<br>Minority | Borrower<br>Income | Month of<br>Orig.<br>Controls | Other<br>Controls | R-<br>Squared | No. of<br>Obs. |
|------------------------------------|-------------------|-------------------|------------------------------|--------------------|-------------------------------|-------------------|---------------|----------------|
| CRA1 (tract/MSA income<br>≤0.8)    | 0.044<br>(0.48)   | 0.878<br>(0.22)   | -                            | -                  | Yes                           | No                | 6.1%          | 40,442         |
| CRA1 (tract/MSA income<br>≤0.8)    | -0.009<br>(-0.23) | -0.884<br>(-0.57) | -                            | -                  | Yes                           | Yes               | 42.7%         | 40,442         |
| CRA2 (borrower/MSA<br>income ≤0.8) | 0.084<br>(1.64)   | -                 | -                            | 4.061*<br>(1.83)   | Yes                           | No                | 8.0%          | 15,925         |
| CRA2 (borrower/MSA<br>income ≤0.8) | -0.002<br>(-0.06) | -                 | -                            | 1.756<br>(1.03)    | Yes                           | Yes               | 46.3%         | 15,925         |

# Regression Results

## Rates, GSE Affordable Housing Goals

|  | Goal<br>Dummy      | Tract<br>Income   | Tract<br>Percent<br>Minority | Borrower<br>Income  | Month of<br>Orig.<br>Controls | Other<br>Controls | R-<br>Squared | No. of<br>Obs. |
|--|--------------------|-------------------|------------------------------|---------------------|-------------------------------|-------------------|---------------|----------------|
| UAG1 (tract minority<br>share >=0.3)       | 0.459***<br>(4.14) | -                 | -17.28***<br>(-3.12)         | -                   | Yes                           | No                | 6.7%          | 36,000         |
| UAG1 (tract minority<br>share >=0.3)       | 0.017<br>(0.52)    | -                 | -0.48<br>(-0.36)             | -                   | Yes                           | Yes               | 41.9%         | 36,000         |
| UAG2 (tract/MSA income<br><=0.9)           | 0.056<br>(0.60)    | -1.287<br>(-0.34) | -                            | -                   | Yes                           | No                | 6.0%          | 39,660         |
| UAG2 (tract/MSA income<br><=0.9)           | -0.041<br>(-1.26)  | -1.623<br>(-1.13) | -                            | -                   | Yes                           | Yes               | 41.5%         | 39,660         |
| SAG1 (borrower/MSA<br>income<=0.6)         | -0.113*<br>(-1.81) | -                 | -                            | -6.852**<br>(-2.55) | Yes                           | No                | 9.1%          | 9,750          |
| SAG1 (borrower/MSA<br>income<=0.6)         | -0.050<br>(-1.07)  | -                 | -                            | -1.068<br>(-0.54)   | Yes                           | Yes               | 47.4%         | 9,750          |
| SAG2 (borrower&tract<br>/MSA income <=0.8) | -0.076<br>(-0.49)  | -3.673<br>(-0.82) | -                            | -3.745<br>(-0.76)   | Yes                           | No                | 10.5%         | 1,176          |
| SAG2 (borrower&tract<br>/MSA income <=0.8) | -0.041<br>(-0.35)  | -4.083<br>(-1.14) | -                            | -1.793<br>(-0.48)   | Yes                           | Yes               | 49.0%         | 1,176          |
| LMIG (borrower/MSA<br>income<=1.0)         | 0.166***<br>(3.15) | -                 | -                            | 4.035*<br>(1.68)    | Yes                           | No                | 7.8%          | 18,687         |
| LMIG (borrower/MSA<br>income<=1.0)         | 0.064<br>(1.58)    | -                 | -                            | 4.239**<br>(2.29)   | Yes                           | Yes               | 45.6%         | 18,687         |



# Probit Results

## Default, CRA

|                                    | Goal<br>Dummy     | Tract<br>Income   | Tract<br>Percent<br>Minority | Borrower<br>Income | Month of<br>Orig.<br>Controls | Other<br>Controls | Pseudo R-<br>Squared | No. of<br>Obs. |
|------------------------------------|-------------------|-------------------|------------------------------|--------------------|-------------------------------|-------------------|----------------------|----------------|
| CRA1 (tract/MSA income<br>≤0.8)    | -0.006<br>(-0.59) | -0.319<br>(-0.78) | -                            | -                  | Yes                           | No                | 10.3%                | 40,442         |
| CRA1 (tract/MSA income<br>≤0.8)    | -0.005<br>(-0.57) | -0.259<br>(-0.73) | -                            | -                  | Yes                           | Yes               | 17.2%                | 40,442         |
| CRA2 (borrower/MSA<br>income ≤0.8) | -0.011<br>(-1.11) | -                 | -                            | -0.297<br>(-0.67)  | Yes                           | No                | 7.2%                 | 15,925         |
| CRA2 (borrower/MSA<br>income ≤0.8) | -0.011<br>(-1.08) | -                 | -                            | -0.224<br>(-0.52)  | Yes                           | Yes               | 13.6%                | 15,925         |

# Probit Results

## Default, GSE Affordable Housing Goals

|  | Goal<br>Dummy       | Tract<br>Income | Tract<br>Percent<br>Minority | Borrower<br>Income | Month of<br>Orig.<br>Controls | Other<br>Controls | Pseudo R-<br>Squared | No. of<br>Obs. |
|--|---------------------|-----------------|------------------------------|--------------------|-------------------------------|-------------------|----------------------|----------------|
| UAG1 (tract minority<br>share >=0.3)       | 0.011<br>(1.31)     | -               | -0.768**<br>(-2.17)          | -                  | Yes                           | No                | 9.4%                 | 36,000         |
| UAG1 (tract minority<br>share >=0.3)       | -0.007<br>(-1.09)   | -               | -0.016<br>(-0.06)            | -                  | Yes                           | Yes               | 17.3%                | 36,000         |
| UAG2 (tract/MSA income<br><=0.9)           | 0.025**<br>(2.30)   | 0.644<br>(1.21) | -                            | -                  | Yes                           | No                | 9.8%                 | 39,660         |
| UAG2 (tract/MSA income<br><=0.9)           | 0.019*<br>(1.87)    | 0.447<br>(0.95) | -                            | -                  | Yes                           | Yes               | 16.6%                | 39,660         |
| SAG1 (borrower/MSA<br>income<=0.6)         | 0.012<br>(0.82)     | -               | -                            | 0.403<br>(0.64)    | Yes                           | No                | 5.8%                 | 9,750          |
| SAG1 (borrower/MSA<br>income<=0.6)         | 0.012<br>(0.88)     | -               | -                            | 0.502<br>(0.83)    | Yes                           | Yes               | 11.0%                | 9,750          |
| SAG2 (borrower&tract<br>/MSA income <=0.8) | -0.044<br>(-1.60)   | 0.052<br>(0.06) | -                            | -0.001<br>(-1.07)  | Yes                           | No                | 7.4%                 | 1,176          |
| SAG2 (borrower&tract<br>/MSA income <=0.8) | -0.033<br>(-1.22)   | 0.234<br>(0.27) | -                            | 0.002<br>(1.33)    | Yes                           | Yes               | 14.1%                | 1,176          |
| LMIG (borrower/MSA<br>income<=1.0)         | -0.017*<br>(-1.68)  | -               | -                            | -0.897*<br>(-1.91) | Yes                           | No                | 8.6%                 | 18,687         |
| LMIG (borrower/MSA<br>income<=1.0)         | -0.020**<br>(-2.00) | -               | -                            | -0.863*<br>(-1.92) | Yes                           | Yes               | 15.4%                | 18,687         |

# Robustness

- Alternative bandwidths
  - no qualitative difference with one or five percentage point windows
- Full documentation loans only
  - no qualitative difference when sample is restricted to full documentation loans

# Understanding the Results 1:

## Evolution of GSEs' Affordable Housing Goals over Time

|      | UAG | SAG | LMIG |
|------|-----|-----|------|
| 1996 | 21% | 12% | 40%  |
| 1997 | 24% | 14% | 42%  |
| 1998 | 24% | 14% | 42%  |
| 1999 | 24% | 14% | 42%  |
| 2000 | 24% | 14% | 42%  |
| 2001 | 31% | 20% | 50%  |
| 2002 | 31% | 20% | 50%  |
| 2003 | 31% | 20% | 50%  |
| 2004 | 31% | 20% | 50%  |
| 2005 | 37% | 22% | 52%  |
| 2006 | 38% | 23% | 53%  |
| 2007 | 38% | 25% | 55%  |
| 2008 | 39% | 27% | 56%  |
| 2009 | 32% | 18% | 43%  |

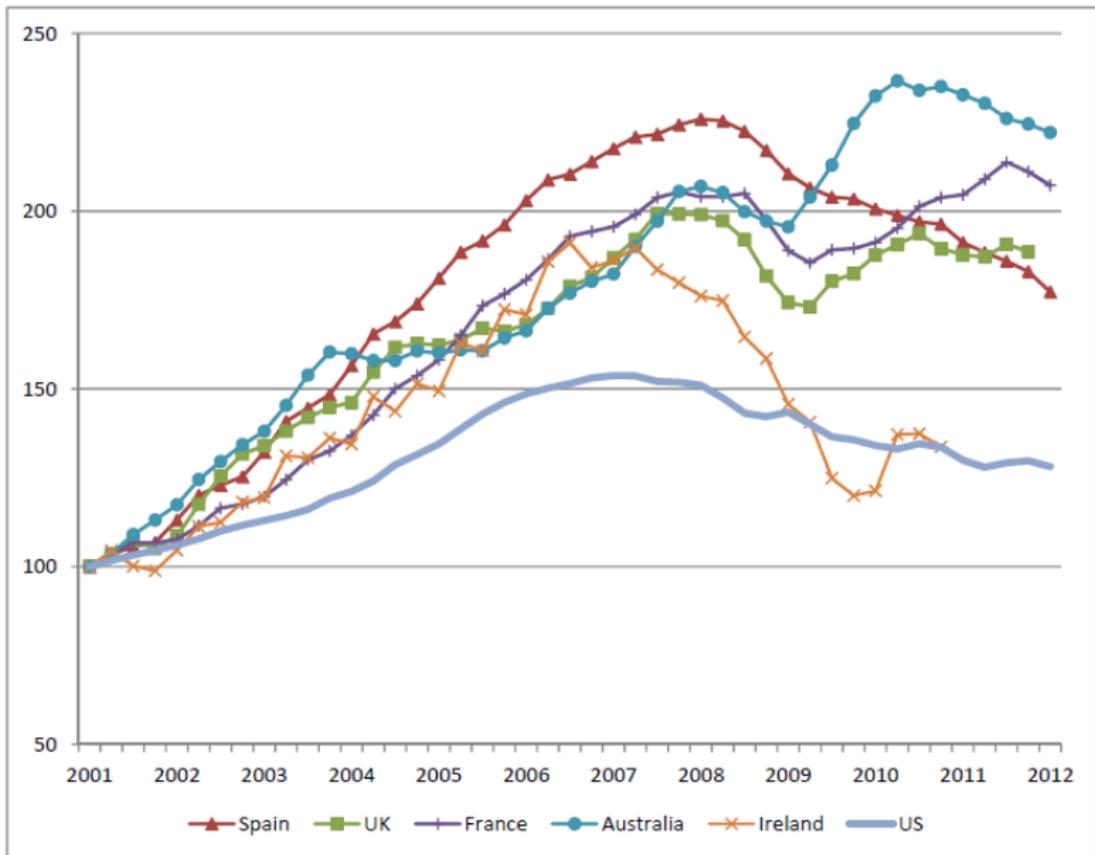
## Understanding the Results 2:

### Borrower Income vs. Tract Income

- Many of the goals are specific to the borrower's income
  - get credit for loans to low-income borrowers
- Evidence in our sample suggests that borrowers reported much higher income than income in the MSA but that borrowers live in low income census tract
  - average reported borrower income is 173% of the median income in the MSA
  - average census tract income is 93% of the median income in the MSA
- If goals really affected the market, would expect borrowers to be *underreporting*, not overreporting income

# Understanding the Results 3:

## US Housing Boom in an International Context



# Conclusions

- Used a regression discontinuity approach to identify effect of affordable housing mandates on subprime loans securitized into PLMBS
- Found no effect from affordable housing mandates
- Our results from the PLMBS market complement those from other parts of the mortgage market:
  - Bhutta (forthcoming): using data from mid 1990s to mid 2000s, finds quite limited effect of UAG in prime market