

# Do Asset Price Bubbles have Negative Real Effects?

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# How do Asset Bubbles Affect the Larger Economy?

## Balance Sheet Channel:

- ▶ Positive asset price shock increases real investment by firms.
  - ▶ Increased investment amplifies the positive economic growth.
  - ▶ Bernanke and Gertler (1989), Kiyotaki and Moore (1997), Holmstrom and Tirole (1997)
- ▶ Housing appreciation also increases consumer wealth and demand.
  - ▶ Increased consumer demand spurs economic growth.
  - ▶ Used to justify intervention to support housing prices.

# How Do Banks Respond to Rising Housing Prices?

## Our Focus: Bank Lending Channel

- ▶ Intermediaries provide additional amplification to positive shock.
  - ▶ Gertler and Kiyotaki (2010), Rampini and Viswanathan (2010)
- ▶ Asset bubble crowds out lending to other sectors.
  - ▶ Farhi and Tirole (2012), Bleck and Liu (2012)

## Do rising prices help or hurt commercial lending?

- ▶ Focus on 1988-2006 (strong housing market).
- ▶ Use IV for correlation between prices and economic conditions.

# Find Negative Effects for Commercial Lending

Banks shift from commercial lending to mortgage lending.

Shift hurts firms associated with these banks.

- ▶ Firm investment drops.
- ▶ Loan size decreases and cost of borrowing increases.
- ▶ Effects stronger for firms with fewer sources of external capital.
- ▶ Effects stronger for firms which borrow from smaller, more regional banks.

First to document negative effects of asset price *appreciation*.

- ▶ Recent papers document positive effects during housing bubble:
  - ▶ Chaney, Sraer, Thesmar (2012), Adelino, Schoar, Severino (2013).
- ▶ Or negative effects during the collapse of an asset bubble:
  - ▶ Bernanke (1983), Gan (2007), Cuñat, Cvijanović, Yuan (2013).
- ▶ Complements evidence of mortgage capital flows across markets:
  - ▶ Loutskina and Strahan (2013).

# Measuring a Bank's Housing Exposure

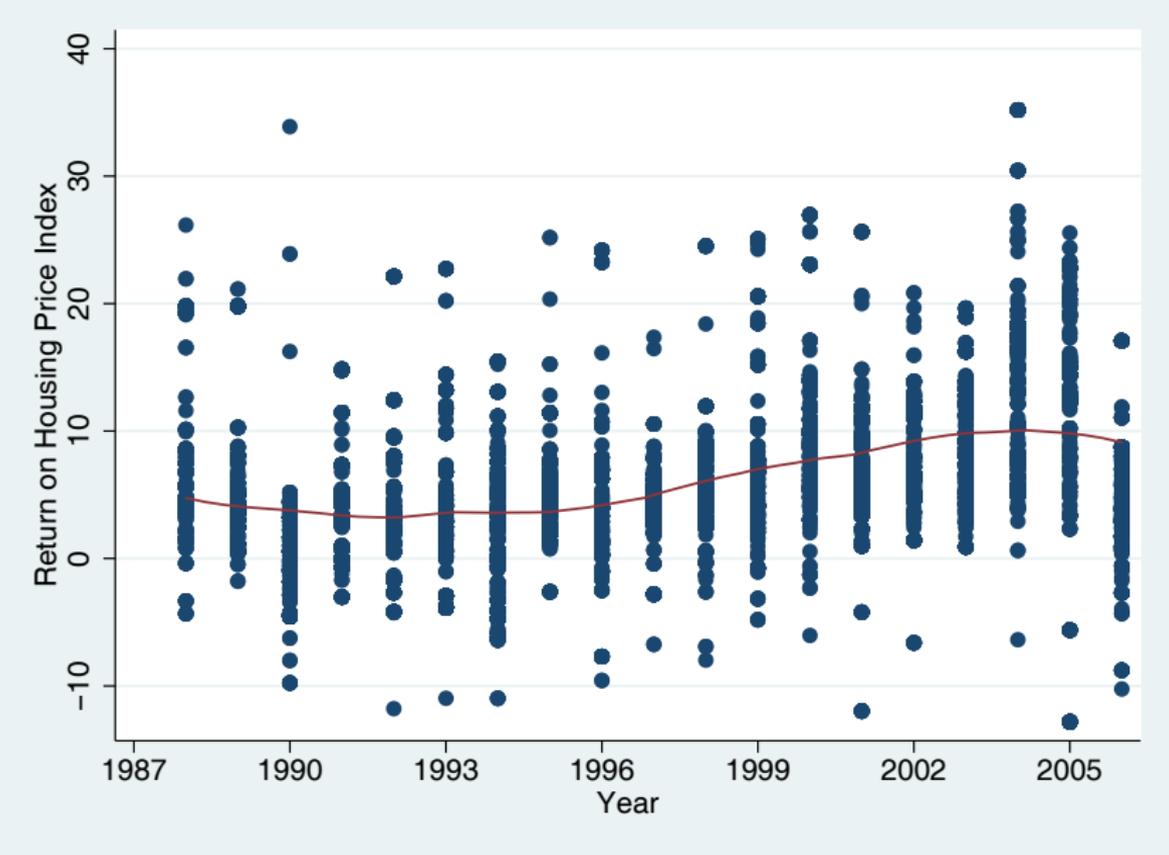
Main variable: Housing Prices in Bank's State(s)

- ▶ Assumption: Mortgage activity largely in bank's deposit base.
- ▶ Create a bank-specific annual weighted housing price index.
  - ▶ Use state-level housing prices.
  - ▶ Use bank's state-level amount of deposits as weights.
  - ▶ Deposit data from FDIC Summary of Deposits.

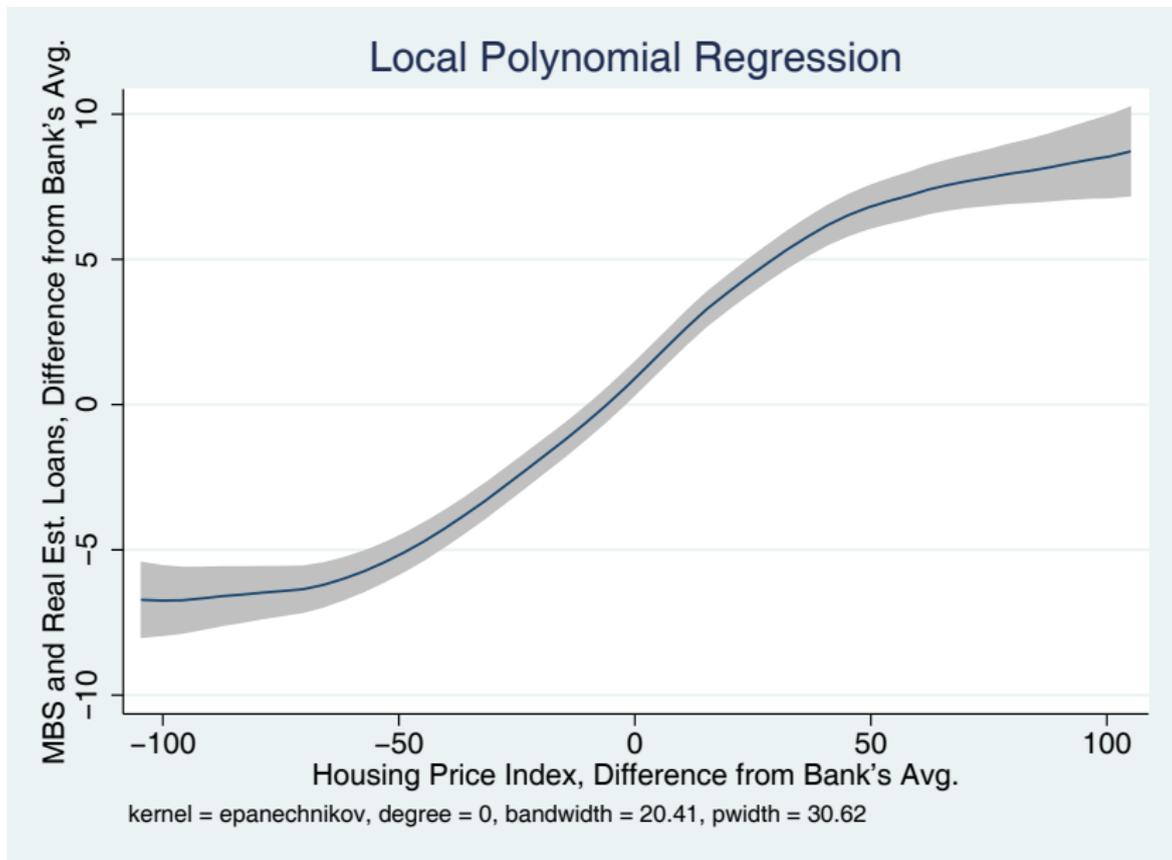
Other data and variables:

- ▶ Housing prices using Federal Housing Finance Agency Index.
- ▶ Call Report data for bank-level results.
- ▶ DealScan to establish relationships and for loan-level results.
- ▶ Compustat for firm-level results.

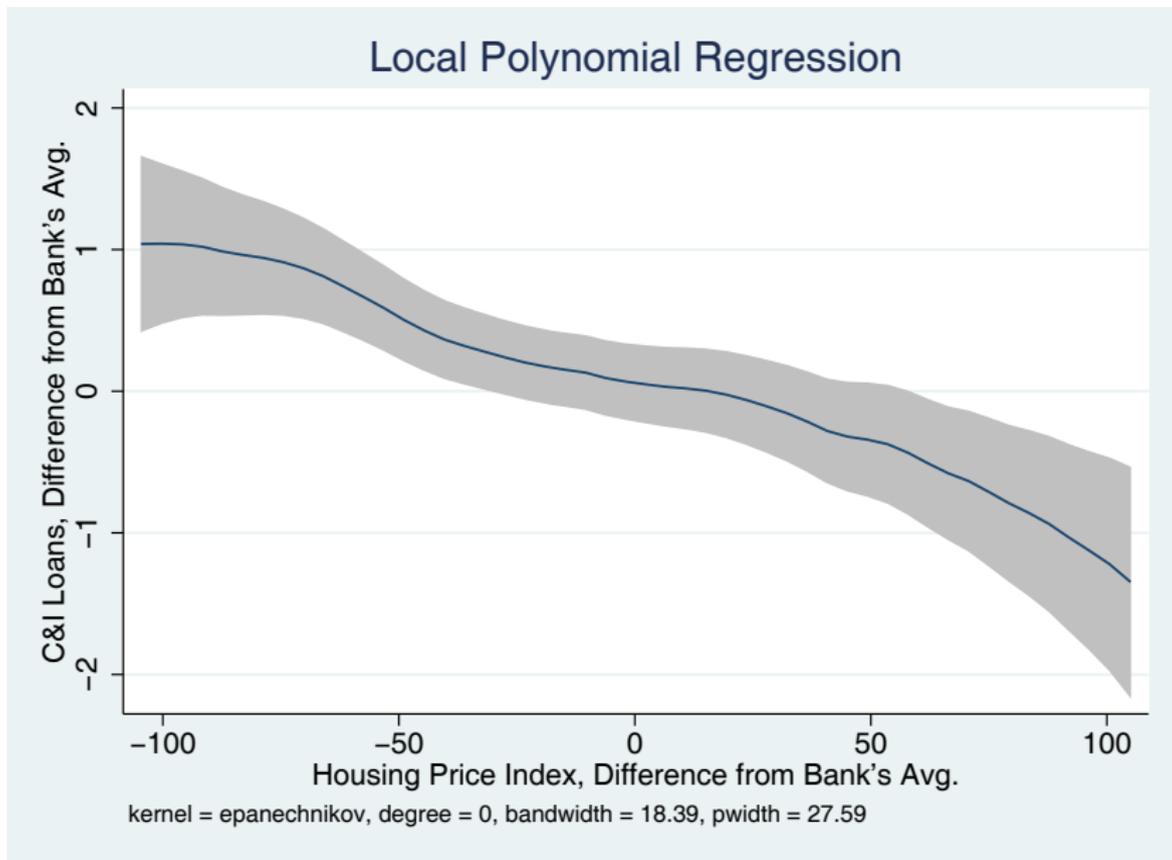
# Return on Housing In Bank's States



# Mortgage Lending Increases with Housing Prices



# Commercial Lending Decreases with Housing Prices



# Housing Price Increases Picking Up Economic Growth

Housing prices correlated with local economic conditions.

- ▶ Should lead to *positive* bias on C&I lending and investment estimates.

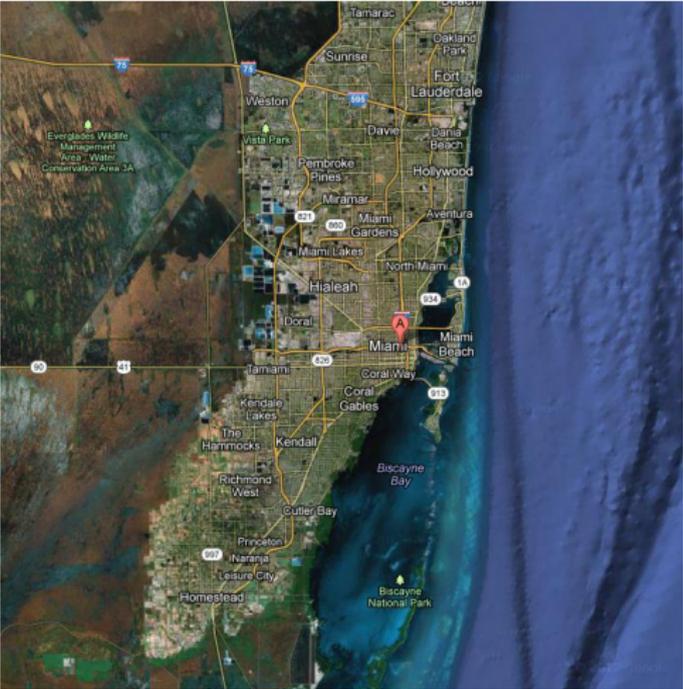
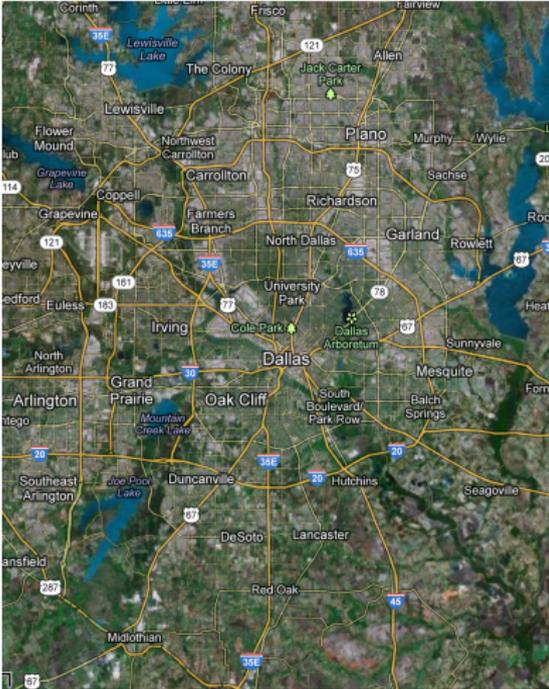
Two instruments that affect C&I loans and investment only through housing.

- ▶ Land Availability + Regulatory Restrictions on Development
  - ▶ Saiz (2010), Gyourko, Saiz, and Summers (2008) [▶ Data](#)
- ▶ Interact variables with state-level 30-year mortgage interest rates.

As the mortgage rate drops, housing demand increases.

- ▶ Given an increase in demand, expect larger price increase if
  - ▶ Less land available for development.
  - ▶ More restrictions on new development.

# Land Available for Development



## Effect on Borrowing Firms' Investment

	(OLS)	(IV)	(OLS)	(IV)
Firm Control Variables	X	X	X	X
Macro Control Variables	X	X	X	X
Housing Price Index, Bank's State(s)	-4.679*** (0.737)	-6.334*** (0.578)	-5.601* (2.957)	-11.86*** (4.397)
National Banks $\times$ HPI, Bank's State(s)			4.451** (2.141)	8.008*** (2.793)
Firm-Bank Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes
Observations	19133	19133	19133	19133
Firms	3161	3161	3161	3161
Adjusted $R^2$	0.422	0.422	0.427	0.427

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Loan Interest Rate Spreads

	(1)	(2)	(3)	(4)
Firm Control Variables	X	X	X	X
Macro Control Variables	X	X	X	X
Housing Price Index, Bank's State(s)	8.043*** (2.502)	7.579*** (2.428)	9.039** (3.528)	9.124*** (3.487)
Large National Banks		3.483 (4.775)		3.446 (5.124)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes
Observations	7113	7113	7113	7113
Firms	1894	1894	1894	1894
Adjusted $R^2$	0.583	0.583	0.586	0.586

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## Commercial Lending: Loan Amount

	(OLS)	(IV)	(IV)	(IV)
Firm Control Variables	X	X	X	X
Macro Control Variables	X	X	X	X
Housing Price Index, Bank's State(s)	-3.741*** (0.864)	-6.395*** (1.291)	-4.831* (2.772)	-4.522* (2.611)
Large National Banks				4.346** (1.762)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes
Observations	7490	7490	7490	7490
Firms	1971	1971	1971	1971
Adjusted $R^2$	0.354	0.356	0.362	0.363

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## Investment: Constrained and Unconstrained Firms

Top tercile (Unconstrained) and bottom tercile (Constrained) by firm size.

- ▶ Other constraint measures: public debt access, payout policy.

	(Constrained)	(Unconstrained)
Firm Control Variables	X	X
Macro Control Variables	X	X
Housing Price Index, Bank's State(s)	-9.095*** (2.145)	-3.541*** (0.617)
Firm-Bank Fixed Effects	Yes	Yes
Observations	8202	3969
Firms	1751	576
Adjusted $R^2$	0.392	0.538

Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## Comparison With Collateral Channel

Chaney, Sraer, and Thesmar (2012) find increases in market value of firm's buildings associated with increased investment.

	(OLS)	(IV)	(IV)	(IV)
Firm Control Variables	X	X	X	X
Macro Control Variables	X	X	X	X
Housing Price Index, Bank's State(s)	-3.251*** (0.692)	-7.848*** (1.734)	-19.82*** (4.569)	-6.696* (3.947)
National Banks $\times$ HPI, Bank's State(s)			14.98*** (4.490)	4.581* (2.758)
Large National Banks			-33.96*** (9.776)	-10.93* (6.201)
Market Value of Buildings	4.187*** (1.623)	4.359*** (1.640)	5.039*** (1.558)	4.429*** (1.588)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes
Observations	6682	6682	6682	6682
Firms	906	906	906	906
Adjusted $R^2$	0.380	0.393	0.391	0.404

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## Concluding Remarks

Increased housing prices in bank's deposit area leads to:

- ▶ More mortgage lending.
- ▶ Less commercial lending.

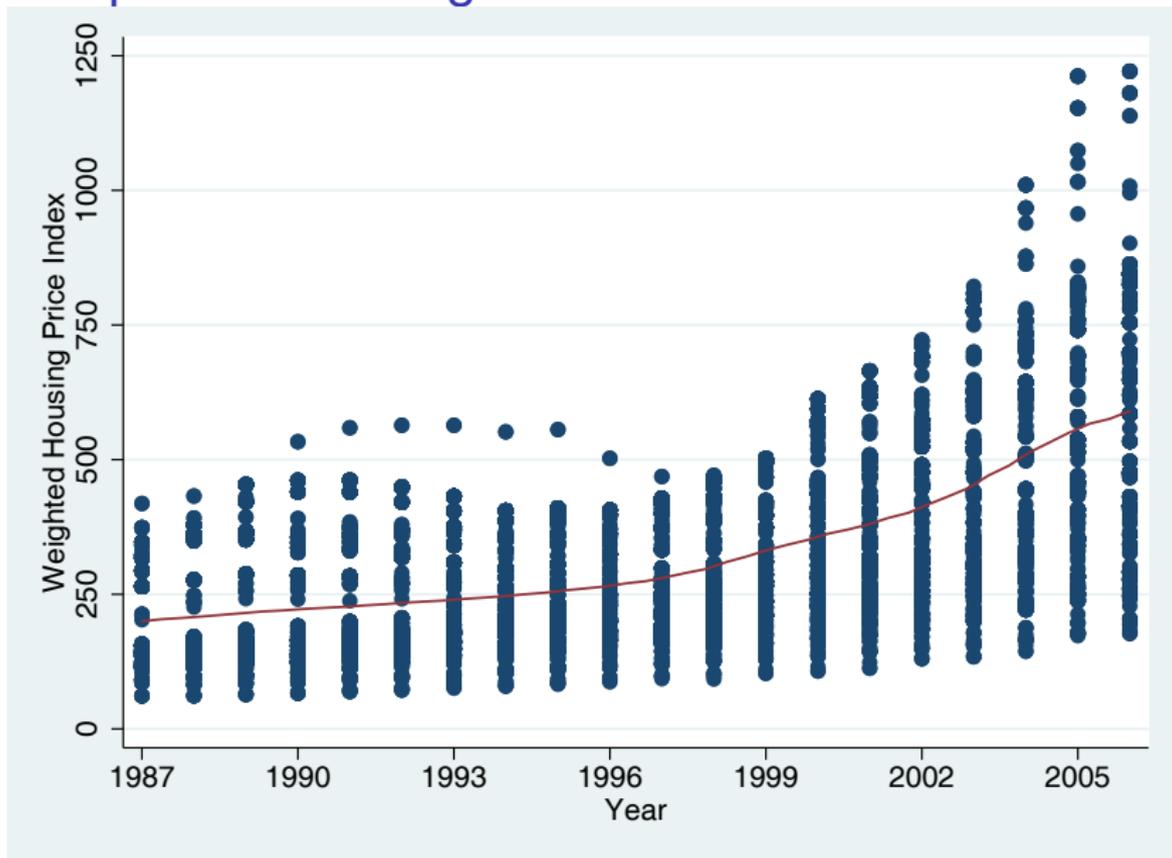
Firms that have relationships with these banks:

- ▶ Have lower investment levels.
- ▶ Have lower loan amounts and pay higher spreads.
- ▶ Effects stronger for firms with fewer sources of external capital, and for smaller banks.

Suggests complicated role for financial intermediaries in asset bubbles.

- ▶ May dampen rather than amplify positive economic shocks.
- ▶ Potential adverse effects of supporting asset markets.

# Bank-Specific Housing Indices



# Saiz (2010), Land Measures

TABLE I  
PHYSICAL AND REGULATORY DEVELOPMENT CONSTRAINTS (METRO AREAS WITH POPULATION > 500,000)

Rank	MSA/NECMA name	Undevelopable area (%)	WRI	Rank	MSA/NECMA name	Undevelopable area (%)	WRI
1	Ventura, CA	79.64	1.21	26	Portland–Vancouver, OR–WA	37.54	0.27
2	Miami, FL	76.63	0.94	27	Tacoma, WA	36.69	1.34
3	Fort Lauderdale, FL	75.71	0.72	28	Orlando, FL	36.13	0.32
4	New Orleans, LA	74.89	-1.24	29	Boston–Worcester–Lawrence, MA–NH	33.90	1.70
5	San Francisco, CA	73.14	0.72	30	Jersey City, NJ	33.80	0.29
6	Salt Lake City–Ogden, UT	71.99	-0.03	31	Baton Rouge, LA	33.52	-0.81
7	Sarasota–Bradenton, FL	66.63	0.92	32	Las Vegas, NV–AZ	32.07	-0.69
8	West Palm Beach–Boca Raton, FL	64.01	0.31	33	Gary, IN	31.53	-0.69
9	San Jose, CA	63.80	0.21	34	Newark, NJ	30.50	0.68
10	San Diego, CA	63.41	0.46	35	Rochester, NY	30.46	-0.06
11	Oakland, CA	61.67	0.62	36	Pittsburgh, PA	30.02	0.10
12	Charleston–North Charleston, SC	60.45	-0.81	37	Mobile, AL	29.32	-1.00
13	Norfolk–Virginia Beach–Newport News, VA–NC	59.77	0.12	38	Scranton–Wilkes-Barre–Hazleton, PA	28.78	0.01
14	Los Angeles–Long Beach, CA	52.47	0.49	39	Springfield, MA	27.08	0.72
15	Vallejo–Fairfield–Napa, CA	49.16	0.96	40	Detroit, MI	24.52	0.05
16	Jacksonville, FL	47.33	-0.02	41	Bakersfield, CA	24.21	0.40
17	New Haven–Bridgeport–Stamford, CT	45.01	0.19	42	Harrisburg–Lebanon–Carlisle, PA	24.02	0.54
18	Seattle–Bellevue–Everett, WA	43.63	0.92	43	Albany–Schenectady–Troy, NY	23.33	-0.09
19	Milwaukee–Waukesha, WI	41.78	0.46	44	Hartford, CT	23.29	0.49
20	Tampa–St. Petersburg–Clearwater, FL	41.64	-0.22	45	Tucson, AZ	23.07	1.52
21	Cleveland–Lorain–Elyria, OH	40.50	-0.16	46	Colorado Springs, CO	22.27	0.87
22	New York, NY	40.42	0.65	47	Baltimore, MD	21.87	1.60
23	Chicago, IL	40.01	0.02	48	Allentown–Bethlehem–Easton, PA	20.86	0.02
24	Knoxville, TN	38.53	-0.37	49	Minneapolis–St. Paul, MN–WI	19.23	0.38
25	Riverside–San Bernardino, CA	37.90	0.53	50	Buffalo–Niagara Falls, NY	19.05	-0.23

# Saiz (2010), Land Measures (cont.)

TABLE I  
(CONTINUED)

Rank	MSA/NECMA name	Undevelopable area (%)	WRI	Rank	MSA/NECMA name	Undevelopable area (%)	WRI
51	Toledo, OH	18.96	-0.57	74	Dallas, TX	9.16	-0.23
52	Syracuse, NY	17.85	-0.59	75	Richmond-Petersburg, VA	8.81	-0.38
53	Denver, CO	16.72	0.84	76	Houston, TX	8.40	-0.40
54	Columbia, SC	15.23	-0.76	77	Raleigh-Durham-Chapel Hill, NC	8.11	0.64
55	Wilmington-Newark, DE-MD	14.67	0.47	78	Akron, OH	6.45	0.07
56	Birmingham, AL	14.35	-0.23	79	Tulsa, OK	6.29	-0.78
57	Phoenix-Mesa, AZ	13.95	0.61	80	Kansas City, MO-KS	5.82	-0.79
58	Washington, DC-MD-VA-WV	13.95	0.31	81	El Paso, TX	5.13	0.73
59	Providence-Warwick-Pawtucket, RI	13.87	1.89	82	Fort Worth-Arlington, TX	4.91	-0.27
60	Little Rock-North Little Rock, AR	13.71	-0.85	83	Charlotte-Gastonia-Rock Hill, NC-SC	4.69	-0.53
61	Fresno, CA	12.88	0.91	84	Atlanta, GA	4.08	0.03
62	Greenville-Spartanburg-Anderson, SC	12.87	-0.94	85	Austin-San Marcos, TX	3.76	-0.28
63	Nashville, TN	12.83	-0.41	86	Omaha, NE-IA	3.34	-0.56
64	Louisville, KY-IN	12.69	-0.47	87	San Antonio, TX	3.17	-0.21
65	Memphis, TN-AR-MS	12.18	1.18	88	Greensboro-Winston-Salem-High Point, NC	3.12	-0.29
66	Stockton-Lodi, CA	12.05	0.59	89	Fort Wayne, IN	2.56	-1.22
67	Albuquerque, NM	11.63	0.37	90	Columbus, OH	2.50	0.26
68	St. Louis, MO-IL	11.08	-0.73	91	Oklahoma City, OK	2.46	-0.37
69	Youngstown-Warren, OH	10.52	-0.38	92	Wichita, KS	1.66	-1.19
70	Cincinnati, OH-KY-IN	10.30	-0.58	93	Indianapolis, IN	1.44	-0.74
71	Philadelphia, PA-NJ	10.16	1.13	94	Dayton-Springfield, OH	1.04	-0.50
72	Ann Arbor, MI	9.71	0.31	95	McAllen-Edinburg-Mission, TX	0.93	-0.45
73	Grand Rapids-Muskegon-Holland, MI	9.28	-0.15				