THE GEOGRAPHY OF FORECLOSURES
METROPOLITAN PHOENIX, ARIZONA

CAROL ATKINSON-PALOMBO
CONNECTICUT

UNIVERSITY OF
ASSESSING THE IMPACT OF LIGHT RAIL TRANSIT ON LAND VALUES AND TAX REVENUES

CAROL ATKINSON-PALOMBO (GEOGRAPHY)
Foreclosure Hotspot

Confined crisis

Two maps, one from 2003 and the other from 2006, show that rising rates of foreclosure were most severe in a few areas. Last year, 35 counties accounted for half of the nation’s foreclosure actions.

The 35 counties with the highest number of foreclosure actions in 2006. In 2006, those counties accounted for 38% of the nation’s foreclosure actions.

1 Includes default notices, auctions and repossessions by lenders

Source: RealtyTrac

By Brad Heath and Dave Merrill, USA TODAY
CONDOS IN LRT CORRIDOR
Confined crisis

Two maps, one from 2008 and the other from 2006, show that rising rates of foreclosure were most severe in a few areas. Last year, 35 counties accounted for half of the nation’s foreclosure actions. The 35 counties with the highest number of foreclosure actions in 2008. In 2006, those counties accounted for 39% of the nation’s foreclosure actions.

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LITERATURE

POLITICAL ECONOMY

SUBPRIME LENDING & NEIGHBORHOODS

SPATIAL SPILLOVERS

N’HOOD APPROACH INCLUDING CONTAGION
Subprime loan defaults (2000 onwards)

Subprime lending entered a “borrower chasing lender” phase

Crisis hit global proportions (2007)
Research Questions

How did the foreclosure crisis unfold in a highly impacted area?

Why do some neighborhoods within a metropolitan region experience foreclosure while others do not?

How did gasoline prices contribute to the foreclosure crisis?
Study Area
Land Use 1995
<table>
<thead>
<tr>
<th>DATA</th>
<th>SOURCE</th>
<th>SCALE</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATASET</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORECLOSURES AND HOUSING STOCK</td>
<td>MARICOPA COUNTY ASSESSOR’S OFFICE</td>
<td>LAND PARCEL</td>
<td>01/07 – 02/09</td>
</tr>
<tr>
<td>SOCIO-ECONOMIC, RACE/ETHNICITY, HOUSEHOLD COMP.</td>
<td>US CENSUS</td>
<td>CENSUS TRACT</td>
<td>2000</td>
</tr>
<tr>
<td>TRANSPORTATION COSTS</td>
<td>NHTS</td>
<td>CENSUS TRACT</td>
<td>2000</td>
</tr>
<tr>
<td>LOAN CHARACTERISTIC</td>
<td>LPS</td>
<td>ZIP CODE</td>
<td>01/07</td>
</tr>
</tbody>
</table>
Percent of Mortgages with a Loan-to-Value Ratio of 80-84%
Percent of Mortgages with a Loan-to-Value Ratio of 85-89%
Percent of Mortgages with a Loan-to-Value Ratio of 90-94%

Percent
- 0.0 - 3.6
- 3.6 - 6.5
- 6.5 - 8.9
- 8.9 - 14.7
- 14.7 - 23.7

(c)
Percent of Mortgages with a Loan-to-Value Ratio of 95% and Higher

- 0.0 - 2.9
- 2.9 - 5.6
- 5.6 - 7.7
- 7.7 - 9.4
- 9.4 - 12.0
Percent of Lenders with a FICO Score Less than 620

Percent

- 0.0 - 2.7
- 2.7 - 7.3
- 7.3 - 9.8
- 9.8 - 12.4
- 12.4 - 16.7

(a)
Percent of Lenders with a FICO Score Greater than 700

Percent

- 21.3 - 27.1
- 27.1 - 31.6
- 31.6 - 39.9
- 39.9 - 59.7
- 59.7 - 100.0
Percent of Mortgages that are Subprime

Percent

- 0.0 - 5.8
- 5.8 - 10.9
- 10.9 - 14.0
- 14.0 - 17.9
- 17.9 - 23.2
METHODS

GIS

• FISHNETTING

STATISTICAL MODELS

• PCA & BINARY LOGISTIC REGRESSION
• CLUSTER ANALYSIS & ANOVA
• BINARY LOGISTIC REGRESSION WITH(out) CONTAGION VARIABLE
FC RATE = 5.8%

52,241 REOs FROM 01/07 TO 02/09
1. PCA & Binary Logistic Regression

22 Independent Variables

- LTV Ratios, Credit, Loan Type
- Household Composition
- Race/Ethnicity, Income
- Education
- ARM
Binary Logistic Regression

\[
\ln \left( \frac{p_{FC}}{1 - p_{FC}} \right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots + \beta_n X_n
\]
Neighborhood Types Based on Socio-Economic and Racial/Ethnic Variables and Mortgage Loan Profile

Cluster Category
- Middle Income Whites/Highly Leveraged/High Transport Costs
- Very Low Income Minority/Highly Leveraged/Poor Credit/Subprime
- Very High Income Whites with High Level of Home Equity
- Low Income, Racially/Ethnically Diverse, Highly Leveraged/Subprime
- High Income Whites with High Levels of Home Equity

2. Cluster Analysis & ANOVA
Binomial Logistic Regression

\[
\ln \left( \frac{p_{F,t}}{1 - p_{F,t}} \right) = \beta_0 + \beta_{NT1}X_{NT1} \\
+ \beta_{NT2}X_{NT2} + \beta_{NT3}X_{NT3} + \beta_{NT4}X_{NT4} + \beta_{NT5}X_{NT5} \\
+ \beta X_{r,t-1}
\]
All 4 factors are statistically significant predictors of foreclosure.

Race/ethnicity and income (which are interrelated) have a separate effect from loan characteristics and credit.

Neighborhoods with higher pct of ARMs are more likely to experience foreclosure.
RESULTS: MODEL 2

The graph illustrates the foreclosure rate (%) over time for different income and minority status categories. The categories include:

- Middle income White
- Very low income Minority
- Very high income White
- Low-to-middle income Minority
- High income White

The x-axis represents time in quarters (Q1 to Q9), and the y-axis represents the foreclosure rate (%). The graph shows the trends and differences in foreclosure rates among these categories over the specified time period.
Results

- Neighborhood type is a statistically significant predictor of foreclosure.
- Neighborhood types 2 and 4 are orders of magnitude more likely than others to experience foreclosure.
- The contagion variable is statistically significant in all nine quarters.
EFFECT OF GASOLINE PRICES

CHOSE ONE TYPE OF NEIGHBORHOOD, MIDDLE INCOME

RAN MODELS FOR F.C. RATES EACH MONTH INCLUDING DYNAMIC TRANSPORTATION COSTS BASED ON AVERAGE MONTHLY GASOLINE PRICES

KEPT VMT CONSTANT
RESULTS

On average over the period of study, every $1000 spent on transportation resulted in a 4.5% higher likelihood of a neighborhood having a higher than median foreclosure rate.

(Sig. at .005 level)
CONCLUSIONS

Principal limitation: VMT data (NHTS 2002) plus the model does not take into account behavior change.

Transportation costs contributed to foreclosures over and above other factors including spatial spillover, credit etc.

Highlights the vulnerability of communities to higher gasoline prices.
THANK YOU – QUESTIONS?