

NOTICE OF DEFAULT (NOD) FILINGS IN WASHINGTON COUNTY, OREGON

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INTRODUCTION

As an indicator of neighborhood and regional health, the explosion of foreclosures nationally and locally over the past few years is concerning. About 2.2 percent of all U.S. housing units received at least one foreclosure notice in 2009. California, Florida, Arizona and Illinois accounted for more than 50 percent of the 2009 foreclosure filings. In 2009, Oregon had the 11th highest rate of foreclosures, one foreclosure filing for every 47 housing units. Between 2008 and 2009, Oregon filings increased 89 percent. Compared with 2007, foreclosure filings increased by 303 percent¹.

Most experts agree² that the foreclosure crisis of the past few years has roots in 1990 and early 2000 home mortgage lending practices. In the early 1990's, financial institutions began offering loans with higher risk profiles. The financial sector was able to do this by passing on the risk through bundling these mortgages and selling them on the open market. Because housing was appreciating at a fast clip in the US, the initial market value of these loans were good because most banks and investors believe that even if an individual foreclosed, the property could be sold for much more than the remaining balance owed. As housing appreciation slowed, but before actual depreciation occurred, such loans became much more risky – enough so to nearly drag the financial sector into collapse by late 2008 (Herbert & Apgar Jr., 2010).

The financial and foreclosure crisis may be a national story, but distribution and mechanisms leading to foreclosures vary by region (Herbert & Apgar Jr., 2010). In some cities such as Detroit and Cleveland, early foreclosure hotspots appeared as a result of refinancing, often with sub-prime and discriminatory mortgage vehicles, with stagnating housing prices. In sun-belt cities such as Las Vegas, Nevada and Riverside, California, foreclosures seem to be linked to a speculative housing bubble dependent upon large population growth and migration and a loose money supply. Other regions are more difficult to explain; the extent to which relaxed mortgage underwriting caused declining housing prices or, alternatively, created a class of borrowers more sensitive to declining housing that occurred independently of lending standards is unclear (Gerardi et al., 2009). Furthermore, as the recession and overall stagnation of the economy has dragged on, the character of the foreclosure crisis has begun to change.

¹ RealtyTrac

² The dominant narrative of risky underwriting as the initial driver of both foreclosures and the residential housing market decline remains contested. See (Gerardi, Shapiro, & Willen, 2009) as an alternative treatment which suggests risky underwriting created a class of borrowers more sensitive to, but did not cause, falling house prices.

What is known about Portland's foreclosures? Because Portland is not one of the worst foreclosure cities, research is thin. As a younger and growing region, Portland does not fit the rust-belt mold. Nor does Portland seem to be following the path of Las Vegas, Phoenix, and certain California communities.

Yet Portland, with its historically higher than average unemployment rates, is at risk for defaults due to gaps in employment during a recession. Oregon unemployment peaked mid-2009, but has remained above the national average since then. Portland unemployment also remains higher than national rates; unemployment remains over ten percent as of July 2010 (U.S. Bureau of Labor Statistics, 2010). Furthermore, the housing market in Oregon, temporally lags behind national trends³. It continues to have more sellers than buyers as measured by inventory numbers currently at 11 months⁴ (RMLS, 2010). Nationally, credit remains tight as financial institutions search for the new "normal" after the financial crisis (NeighborWorks America, 2010).

Utilizing Notice of Default (NOD) data from Washington County in the Portland region, this paper seeks to pilot a potential way to understand the economic and demographic risk factors for the region. The analysis occurs at the census tract level, a finer geography than most contemporary literature, which allows for inclusion of several federal data sources.

RISK FACTORS FOR FORECLOSURES

Unemployment

Job loss and the associated drop in household income have traditionally been considered "trigger events" of mortgage default (Herbert & Apgar Jr., 2010)⁵. Areas with high unemployment are at greater risk for high foreclosure rates. Unemployment itself is considered a concurrent if not lagging indicator of the overall economy because it generally takes several months of fast GDP growth to translate into firms hiring workers (Krugman & Wells, 2009).

Various measures of foreclosures lag behind the individual-level shock of unemployment. Notice of Defaults (NOD) are filed after a household falls more than three months (90-day delinquency) behind in payments with auction or bank reversion generally occurring after yet another couple of months. In Oregon, this translates into a five to six month process.⁶

Risky Lending

Risky lending and the selling of risky mortgages on the open market was certainly the cause of the current financial crisis. Even though the banking sector has been

³ For instance, the S&P Case-Shiller index shows Portland prices falling after the national average. These falling prices have continued into mid 2010 even as other metro regions and the nation as a whole have begun to see price increases.

⁴ Six months inventory is considered a balanced ratio of buyers and sellers

⁵ Other commonly cited trigger events include health expenses and divorce.

⁶ See "Foreclosures Overview." Realtytrac.com. <http://www.realtytrac.com/foreclosure/overview.html>

stabilized, many risky mortgages remain and are at high risk for default. Those with risky mortgages are particularly sensitive to house price stagnation since the home often cannot be sold quick enough at a high enough price to stave off default (Foote, Gerardi, Goette, & Willen, 2008). There are several categories of risky mortgages:

1. *Exotic mortgages* are generally defined as mortgages with one or more of the following features: adjustably-rate loans (ARMs), interest-only loans, payment-option loans, negative amortization loans, piggy-back mortgages, and Alt-A (low or no documentation) loans. These exotic features may be made with prime or near prime rates to those with good credit or subprime rates (and thus also considered a subprime mortgage) to those with poor credit. Exotic mortgages were thought to be a way for a homeowner to afford a more expensive house and were popular in regions with higher home prices (Immergluck, 2008). Many who took out such mortgages presumably assumed that mortgage rates would remain low and the mortgage could be refinanced later (ie before the interest rate rose with an ARM) with a more traditional mortgage vehicle. Banks were willing to refinance when housing prices were appreciating but stopped once appreciation slowed and credit markets tightened.
2. *Subprime mortgages* are generally defines as home mortgages with high interest rates (which also often required higher up-front fees) to compensate for a risky credit profile. By 2004, more than one in eight home purchases were subprime mortgages and this rate continued to grow through 2006 (Immergluck, 2008). Subprime loans have received the most attention because these types of mortgages were made to the most risky homeowners and thus made up a disproportionate number of the first wave of foreclosures.
3. *Zero-down payment mortgages* allowed households to buy homes without any up-front equity. These types of mortgages were popular by the mid-2000 in modest-income neighborhoods where households had little or no savings. In higher income neighborhoods, reduced down payments below the traditional 20 percent had similar affect of allowing a household to purchase a larger home than for which they had savings. Many of these homeowners are currently underwater as home prices have dipped to mid-2000 levels. While the negative equity position is a concern, so are the underlying household financial behaviors that led to a low percentage down payment.

Underwater mortgages

As the financial and foreclosure crisis has progressed, overall prices in the housing market have decreased, often dramatically. The has led to many homeowners to a negative equity position, also known as being “upside-down” or “underwater.” While a short-term negative equity position is not normally a concern for a household without any other negative financial stressors, long-term negative equity positions may prompt homeowners to walk away and default.⁷ Current reports suggest that 31 percent of

⁷ Research surrounding mortgage default has been dominated for the past 30 years by the “option based theory” which suggests the most rational reason to default is in fact an underwater position. This risks underplaying the effect of individual household “trigger events,” particularly when the majority of the housing market is underwater (Herbert & Apgar Jr., 2010).

defaults are actually walk away situations up from 22 percent a year ago (Dymi, 2010). The point at which a homeowner perceives the housing market to have such a negative long-term outlook to walk away from an underwater mortgage continues to be debated (Foote, Gerardi, Goette et al., 2008; Foote, Gerardi, & Willen, 2008).

SPATIAL ELEMENTS OF FORECLOSURES

The demographics that lead to targeted use of certain types of risky mortgages in certain regions and neighborhoods also likely lead to spatially clustered foreclosures. Foreclosure drivers such as income, housing market conditions including owner-occupancy and vacancy rates, and local economic conditions such as employment rates all vary by region and neighborhood. Studies of foreclosure rates at the county level in Wisconsin also suggest that median age, large families in rental units, and education status may explain spatial variance (Kashian & Welsch, 2010). In some housing markets, racial patterns may explain additional spatial variation, giving credence to a discriminatory lending narrative (Kaplan & Sommers, 2009).

The spatial concentration of various mortgage risk factors and demographics is further exacerbated by the foreclosed and vacant housing negatively impacting neighborhood, and eventually regional, housing prices. Empirical research on the subject suggests that a foreclosure negatively affects neighboring sales. This negative affect increases the closer the property is to the foreclosed property. Estimates suggest approximately a one percent decline in sales price for a foreclosure within 200 yards (1/8 of a mile) in relatively stable housing markets (Rogers & Winter, 2009).

Mortgage defaults have other negative individual and social costs. Over a third of the individuals dealing with the foreclosure process have been found to be struggling with major depression, many have chronic health issues, and the foreclosure population is more than twice as likely to be without health insurance as their neighbors (Pollack & Lynch, 2009). Other negative externalities such as decreased tax base and blight associated with vacant housing put enormous pressure on local governments (Immergluck, 2008). Because federal foreclosure interventions are not enough and are not locally specific, local governments would be wise to study the spatial risk and foreclosure patterns to inform short and long-term local programs and intervention measures (Edmiston, 2009; Immergluck, 2008, 2009)

DATA & FORECLOSURE INDICATORS

The primary data source as a measure of foreclosure is a count of Notice of Defaults obtained from Washington County public records for December of 2009. There were 374 filings; a rough plat GIS shape file provided by Washington County allowed for 320 unique properties to be geo-coded into 81 census tracts in the county. Multiple filings for a single household were deleted.

Aggregating NODs to the census tract level allowed for two other data sources detailing demographic and mortgage risk to be utilized:

1. Estimated census tract demographic data acquired from ESRI
 - a. Total Household Units in 2009

- b. Median Household Income in 2009
 - c. Median Housing Value in 2009
 - d. Household Growth Rate from 2000 to 2009
 - e. Diversity index for 2009
2. Home Mortgage Disclosure Act (HMDA) is a longitudinal dataset from 2004-2008 (subprime lending data is only classified through 2006). While a publicly available dataset, this analysis utilized data provided by partners at NNIP and summarized at the census tract level. HMDA allows for understanding the relationship, if any, between risky mortgages and foreclosures. The following variables from the HMDA dataset that correspond to the theoretical underpinnings of the current crisis were considered:
- **PctHighcostConvOrig** - % of conventional loans originated that are high cost - ie interest rates greater than 3% over prime
 - **PctSubprimeConvOrig** - % of conventional mortgage loans by subprime lenders
 - **PctMrtgOrigPurchNotOwn1_4** - % of purchase loans for 1 to 4 family units that are not owner-occupied.
 - **AvgMrtgIncl1_4** – Average income of borrower for 1 to 4 family mortgages
 - **MrtgOrigAvgAmtHomePurch1_4** – Average mortgage amount for 1 to 4 family mortgages
 - **Purchase to Refinance Ratio** – Number of conventional mortgages originated for home purchase versus refinance purposes
 - **Refinance Denial Rate** – Denial rate of refinance applications for 1 to 4 family buildings

METHODS

The distributions of each of the variables (HMDA and demographics) were noted and those with obvious exponential distributions were natural log transformed. Because the variables are highly correlated from year to year, the HMDA year with most significant correlation to NOD rate was noted for model inclusion.

The following logistic model where x is the vector of all demographic and HMDA variables was performed in SAS.

$$\text{logit}(p) \equiv \log\left(\frac{p}{1-p}\right) = \alpha + \beta'x$$

Because of multicollinearity issues typical of many economic models, the income, housing values, diversity, subprime and high cost mortgage variables were competing for explanatory power. Consequently, the SCORE option (similar to stepwise regression procedures) of the LOGISTIC procedure was utilized to determine the most parsimonious model where explanatory variables remained statistically significant.

RESULTS

The mean NOD rate in December 2009 for census tracts in Washington County was 0.14 percent (an annualized rate of 1.64 percent) and a median NOD rate 0.12 percent. The standard deviation of the NOD rate was 0.11 percent with a range between 0 and 0.49 percent.

The average loan characteristics for each year among tracts in Washington County are provided below. The year chosen for inclusion in the model is noted with an astrick. Note that subprime lending peaked in Washington County in 2004, only to be replaced by high cost lending in 2005 and 2006. The housing purchase price numbers show an extreme bubble of an increase over 60 percent in the five-year period. While the refinance denial rate holds steady over time, the majority of loans originated in 2008 were refinances rather than house purchase.

Table 1. Attributes of Washington County Loans (HMDA, 2004-2009)

Year	High Cost Loans	By Subprime Lenders	Loans for Not Owner Occupied	Average Income of Borrower	Average Purchase Price	Refinance Denial Rate	Purchase to Refinance Ratio
2004	11.6%	16.1%*	7.76%	\$77,922	\$159,512	49.4%	1.11
2005	21.3%	13.2%	12.8%	\$84,413*	\$168,422	50.1%*	1.29
2006	22.3%	8.0%	13.0%*	\$93,766	\$188,569	48.6%	1.21
2007	12.8%	--	9.6%	\$98,693	\$219,848*	48.6%	1.01
2008	4.9%*	--	8.7%	\$97,158	\$258,191	50.2%	0.58*

The parameter estimates (with statistically significant p-values astricked) for Model 1 - the full Logistic regression – are provided in Table 2. The SCORE option of the SAS LOGISTIC procedure suggested that inclusion of only three variables, housing growth rate (log transformed), non owner occupied loans in 2006, and average income

associated with the loans in 2005 (log transformed) best explained the NOD rate. The parameter estimates and odd ratios for these variables are listed under Model 2.

Table 2. Parameter Estimates and Odds Ratios from Logistic Regression

VARIABLE	MODEL 1	MODEL 2	
	Estimate	Estimate	Odds Ratio (95% CI)
Intercept	-7.2328	-13.0954*	--
Diversity	-0.0050		
Median Household Income (ln)	-0.4780		
Median Housing Value (ln)	0.2133		
Household Growth Rate (ln)	0.4650*	0.4205*	1.523 (1.296 , 1.789)
% High Cost Loans (2008)	-0.0051		
% Subprime Lenders (2004)	-0.0085		
Non Owner Occupied Rate (2006)	0.0350*	0.0345*	1.035 (1.008, 1.063)
Ave Income on Loan (ln) (2005)	0.1495	0.5204*	1.683 (1.039, 2.725)
Ave Loan Price (ln) (2007)	0.1154		
Purchase to Refinance Ratio (2008)	-0.0259		
Refinancing Denial Rate (ln) (2005)	0.0956		

* Significant at the $p < 0.05$ level

The parsimonious model confirms what was suspected by looking at broader scale regional maps of foreclosures in the Portland metro area: Washington County's crisis is located in high growth areas. The inclusion of average income associated with mortgages originated in 2005 and its positive correlation direction suggests that Washington County's crisis has impacted high-income neighborhoods more than low-income neighborhoods.

The neighborhoods that included more non-owner-occupied mortgages in 2006 have a slightly higher probability of foreclosure. The theoretical reasoning for including owner occupied variables are (1) it is a fundamental characteristic of a neighborhood that can possibly point to a low-income, high rental neighborhood and/or (2) it provides a measure of speculation. Knowing that higher income, high growth areas are more likely to have NODs suggests defaults by speculators are likely.

Finally, the removal of subprime lenders and high-cost loans variables from the parsimonious model suggests that Washington County's foreclosure crisis may not be driven as much by risky lending as by the correction of a significant housing bubble in the wake of the greater national mortgage and housing crisis.

POLICY IMPLICATIONS

The national narrative of the current crisis is to focus resources on lower income neighborhoods. In certain cities that have been hit hard by predatory lending in the form of refinancing such as Cleveland, this has also meant focusing preventative efforts in older neighborhoods. The modeling efforts presented above indicate that such strategies are not the most efficient in Washington County. Washington County should not make

the mistake of focusing their resources only in lower income neighborhoods. The model indicates that higher income neighborhoods are at even greater risk than lower income neighborhoods. Foreclosures in higher income neighborhoods also have a greater impact on the property tax base. Instead, Washington County should focus on prevention efforts in high growth areas and utilize property tax data to understand which neighborhoods are rental neighborhoods and thus at greater risk for foreclosure.

FUTURE RESEARCH

With much of the contemporary foreclosure research focused on leading metropolitan areas, the plight of metro regions that have significant housing bubbles fewer issues with risky lending has been ignored. This preliminary research suggests that while the Portland Metro area has succumbed to the national housing and foreclosure crisis, Portland's narrative may be very different than extreme foreclosure cities. This narrative would need to be confirmed by expanding this research in the following ways:

1. **Expand NOD rates to cover all of 2009** – Because December is considered a difficult real estate sales month, the data needs to be expanded to include all of 2009.
2. **Inclusion of the four other counties** in the region would help confirm if the findings are generalizable to the entire region. Because of the massive amount of data, the logistics of coordinating all the metro region's NOD notices is a large task. **Monthly reporting of the NOD rates** for all counties would require
 - a. **Monthly queries of NOD filings** - The experience of Washington County suggests that each county should be able query the following variables:
 - i. NOD document number
 - ii. Plat information including subdivision and lot number
 - iii. Reference document number of original purchase to account for multiple NOD filingsWhile this query can be done at each county's public information computers, transfer of this query electronically would be required for sustained tracking and analysis.
 - b. **Development of a regional plat shape file** to link the NOD filing queries to census tract data. Most counties have a GIS shape file that allows for tax and property information systems to map the property of interest, often on the internet. Presumably these GIS files geocoding through plat shape files. Metro, which maintains RLIS, is in the ideal position to coordinate the compilation and updating of this file for the entire region.
3. **Continue running the analysis for 2010 data** – National discussions of the causes for the ongoing crisis clearly suggest that NODs are a moving target. Waves of foreclosures seem to be corresponding to when one type of risky mortgages becomes unstable when refinancing options are not available. The temporal nature of crisis will require constant monitoring.

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