

Household Responses to Transitory Income Shocks: Evidence from Weather Induced Utility Bill and Mortgage Payment Activity

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Overview

The Great Recession of 2009 was a somber reminder of the sensitivity of mortgage payment activity to economic shocks. In fact, by the end of 2009 over 10 percent of all outstanding mortgages in the United States were one or more months delinquent, up sharply from historical averages of approximately 2.5 percent. The default rate remained above 10 percent until the end of 2012 and even today (4.3 percent as of Q3 2016) is still above historical norms (FFEIC Statistics). For the average homeowner, their house is typically the largest asset on their household balance sheet, typically making up over two-thirds of their household wealth (Iacoviello, 2011). Thus, not only do mortgages defaults have serious global implications for the financial system and economy, but also these defaults are detrimental for households' personal finance. For these reasons, understanding households sensitivity to missing mortgage payments associated with transitory shocks has implications across a number of applications in both economics and finance. Given the lack of information available on disaggregated changes in personal income or expenses, the literature currently provides no point estimates of an elasticity of mortgage default probability with respect to a transitory income shock. In this research, we provide the first estimates.

Methods

We collect monthly information on heating degree days and cooling degree days (HDD and CDD) from the National Oceanic and Atmospheric Administration. We map these degree day data, collected at local airports to zip codes using weighted average distance from airport to closest zip centroid using the three closest zip codes. Next, we match degree day measures to monthly mortgage payment information. Although we have information on individual payment history, we aggregate this information to the zip code level to coincide with the our degree day information.

From our mortgage information, we construct a monthly zip code level measure of delinquency (30+ days late on payment) as well as a host of zip code month year control variables such as loan age, loan type, interest rate, loan to value ratio, FICO score, and fixed effects for month, year, origination year, and loan servicer. Additionally, we will also control for climate region and interactions between our variables of interest (lagged degree days) and climate region, month, and year. Using a panel regression model, we will examine the effects of lagged degree day measures on the monthly zip code default rate. Additionally, we will test for the robustness of our results by using degree days from the previous year, which should not impact current default probability as well as assigning a random degree day treatment from the distribution of degree days observed in our total sample.

Results

In our preliminary results, we find that a one standard deviation increase in number of monthly cooling degree days (pooled average: 125, standard dev. 174, min. 0, max. 1041) is associated with an approximately 1 percent increase in the zip code level default rate for a given month during the summer. We will also conduct this analysis for winter months using cooling degree days. This result is both statistically and economically significant. We also conduct a number of falsification and placebo tests.

Conclusions

Results of this research have significant implications for not only economists who want to understand the sensitivity of high risk households mortgage payment activity associated with transitory income shocks, but also for financial institutions who issue these mortgages, state utility commissions that are concerned with the potential effects of rate increases on local economic conditions, and policy makers more broadly who create policies aimed at promoting homeownership. In this research, we provide the first empirical estimates of an elasticity of mortgage default

probability with respect to a transitory income shock. Furthermore, we indentify the margin of homeowners that are most sensitive to these shocks.

References

M. Iacoviello. Housing wealth and consumption. International Encyclopedia of Housing and Home, 2011.

Federal Financial Institutions Examination Council (FFIEC) Consolidated Reports of Condition and Income (1985-2000: FFIEC 031 through 034; 2001-: FFIEC 031 & 041).