Energy Efficiency in U.S. Residential Rental Housing: Adoption Rates and Impact on Rent

OBJECTIVES:

The goal of this research is to determine a diversity of cities in the U.S.: (i) What are the adoption rates of energy efficiency features in rental properties? (ii) Does having energy efficiency features in rental properties demand rental premiums in rental asking prices? (iii) Is there a relationship between energy efficiency premiums and location-specific environmental conditions?

This is accomplished through collection and analysis of approximately 169,000 rental property listing 10 cities in the U.S.

BACKGROUND:

There are 118 million residential housing units in the U.S.; 43.7 million rental homes (37%).

The “energy efficiency gap” between possible savings and actual realized savings in buildings is particularly significant in the rental sector, due to the “split-incentive” phenomenon.

Rental property owners need additional motivation and tangible benefits to invest in energy efficiency to reduce the energy efficiency gap.

There have been a number of studies in European countries on the impact of energy efficiency on rent, but none in the U.S.

METHODOLOGY:

1) Data collection via online data scraping of Craigslist in 10 cities on select days over a 2 month period (Dec ’16-Jan ’17)

2) Data cleaning and quality control: removed posting with missing pricing, or other key variables, or values that were unreasonable, resulting in 36,827 postings in 10 cities

3) Identification of key energy efficiency terms & adoption rates in listings: five categories of energy efficiency terms and phrases identified through manual and automated searching method, percentages of total listings calculated.

4) Determination of premium for energy efficient features: Propensity score matching method was used to compare the rental prices of properties with energy efficient features and those without.

5) Determination of sub-category trends: • Housing type: apartments, multi-family, single family • Energy efficiency categories: HVAC, appliances, lighting, windows/building envelope

RESULTS

Adoption Rates:

Energy Efficiency Premiums:

Energy efficient features general demand a premium of 6%-14% (statically significant)

San Francisco & Chicago: highest % increase

Atlanta & Chicago: highest $ increase

Individual efficient features are demand premiums

Single family homes demand higher premiums compared to multi-family or apartments

CONCLUSIONS & FUTURE WORK

Results provide motivation to both private and company-type landlords to invest in residential rental properties energy efficiency due to non-energy benefits (monetary)

The energy savings associated with the energy efficiency investments should be studied to determine the overall impact on the renters; the willingness to pay for such features should be studied further.