

How the Single-Family Residence Housing Market Capitalizes Green Property Upgraded Features: Evidence from City of Austin

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Introduction

Home green energy efficiency upgrades have become a new trend in real estate, bringing benefits to builders and home buyers, including tax reduction, health improvement, and energy savings. Studies proved that a sales premium exists for energy certified single-family homes. However, due to data limitations, the existing literature lacks analysis to compare the effects of green upgrades and certification among different types of single-family homes.

By capturing 21,292 data entries of MLS closed home-selling listings at the individual-housing level for the recent 35 months and comparing regression models, this research analyzes the added home value of green sustainability features and green efficiency characteristics rather than green certifications in the city of Austin.

Our research makes the following contributions. First, we perform comparative analyses for green-feature-installed single-family properties with a green energy certification or without one. The results show that the impacts of green upgrade features alone on single-family housing prices are significantly positive. The certificates of green energy homes are not essential for a higher sold price for houses with related lower or quite high selling prices in the housing market in Austin. The home sellers and real estate professionals shall emphasize the green features of these groups of single-family homes instead of obtaining certificates. Second, we demonstrate that the certificates of green energy homes are essential for a higher deal price for median-value homes. We hypothesize that median-value home buyers do care for the discounted loan opportunities (including the green bond policy recently issued by Fannie Mae). Thus, we would recommend median-value home sellers, developers, and real estate agents seek for official green certifications for these homes, maximizing their profits.

Research Goal

- (1) What are the impacts of green energy efficiency features or green sustainability amenities on single-family home selling prices in the city of Austin? And whether they are comparable with the impacts of green certifications or other property-varying features on housing prices.
- (2) After categorizing single-family homes by their final selling prices, how do the effects of having a green energy certification or green upgrade on the closing prices vary across different groups of single-family homes in Austin?

Methods

We construct the ordinary least squares (OLS) model with hedonic pricing concepts.

$$Y_i = \alpha + \beta_{ij} \text{Green}_{ij} + \gamma N_i + \theta \cdot \text{month} + \epsilon$$

where Y_{it} represents the closing price of property i closed; Green_{ij} represents the dummy indicators of the green upgrade features j (green certification, green energy efficiency, or green sustainability); N_i are property-varying controls; $\theta \cdot \text{month}$ represents the monthly controls to eliminate seasonality; and ϵ is the noise term.

Results

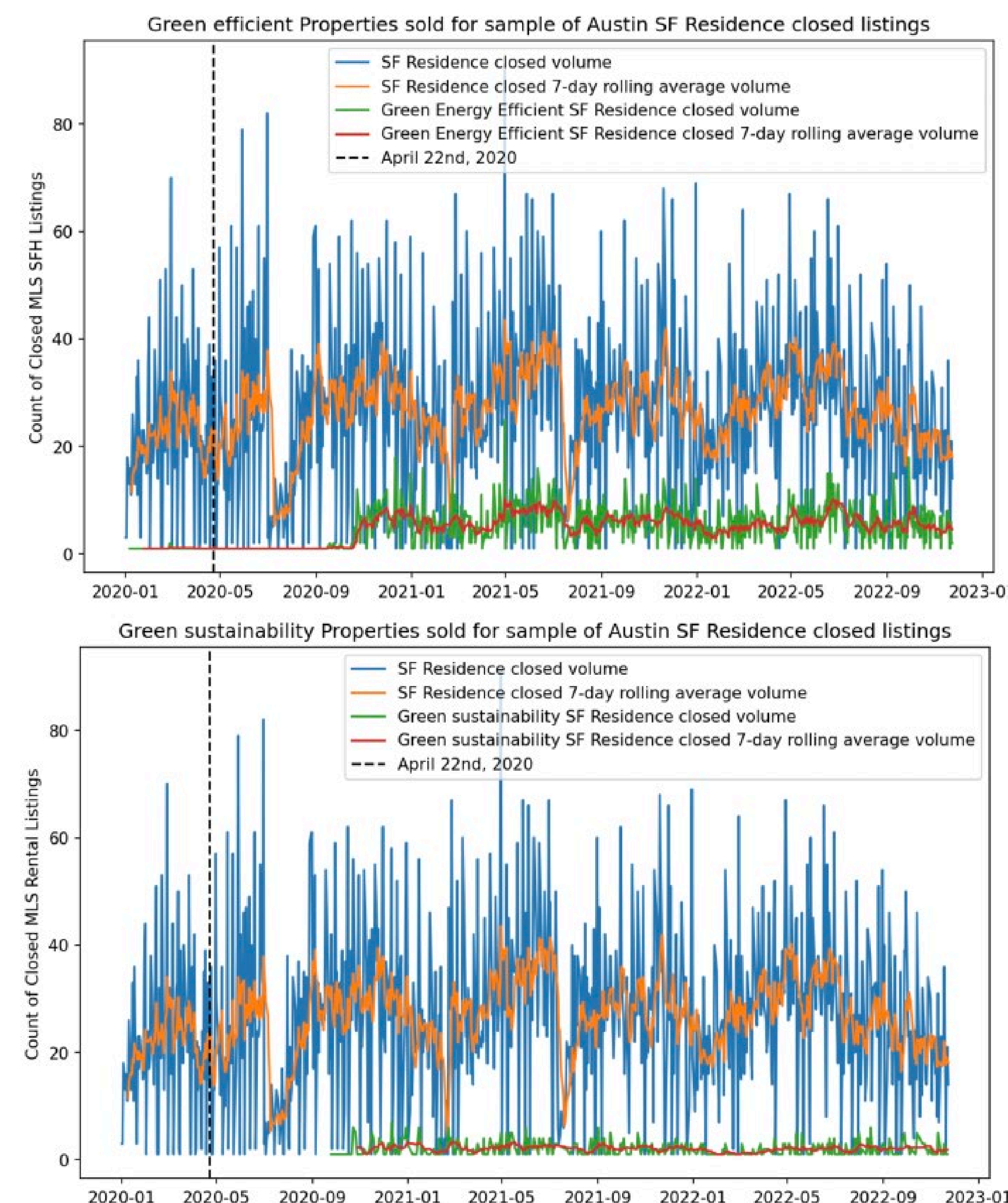


Figure 1: Daily close volumes of green, efficient properties (upper panel) Daily close volumes of green sustainability properties (lower panel) compared to daily close volumes of MLS listings in Austin, Jan 2020 - Nov 2022.

Figure 1 shows the comparison between closed green properties listing volumes and the total closed listing volume of the sales of single-family homes in Austin. Since the trends of daily volumes are noisy, we add the curves of 7-day rolling average volume in these figures.

- The sales of homes with green certifications are a small percentage of total home sales, which is 0.174% (37 homes).
- Nearly 15.34% of the sample (3,266 homes) is energy-efficient-amenities-installed, whereas only about 3.75% of the sample (798 homes) is energy-sustainable-materials-contained.
- The impacts of green energy efficiency features and green sustainability features on housing prices are significantly positive for the single-family properties sold in Austin during the past two years.
- The value-adds from housing energy efficiency and energy sustainability upgrades align with our initial hypothesis, and the positive directions of impacts for the single-family-residence sector are the same as we predicted.
- However, the insignificant effects of green energy certifications within three home groups are unexpected – perhaps the data amounts of properties with official certificates within those groups are not sufficient for the regressions.
- The results for median-priced group align with our initial hypothesis – the average price premium brought by official green certifications for median-priced homes is 13.17%, which is almost 8% higher than the positive effects brought by a listed green efficiency feature (5.20%) or a listed green sustainability feature (2.73%).

Conclusion

- The impacts of green certifications and listed green features on single-family residence market prices in the city of Austin vary within different home price groups. The results show that a green efficiency feature generally increases single-family housing prices by 11.9%, and a green sustainability upgrade potentially brings an 11.7% higher selling price.
- While green housing certification does not have significant effects on most housing groups, it could increase closing prices by 13.2% for single-family residences sold at the medium price range, which is higher than the impacts from simply listing the green features on MLS.
- Unprecedentedly, this study differentiates the impacts of the green certificates and listed green features across different home price groups, identifying the importance of official green certificates for median-priced homes on the market.
- Besides, we recommend that future case studies conduct a comparative analysis of the impacts of green home features across separate residential sectors, including apartments, condos, and duplexes, to improve the comprehensiveness and accuracy of their results.

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