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Uncovering Deceptive Practices: A Data-Driven Examination of Inflated Home Appraisal in Mortgage Origination with Insights from Foreclosed Property Data

Abstract

This research paper investigates the persistent issue of artificially inflated property appraisals during the loan origination process. Using a dataset of 1,036,980 homes liquidated from Fannie and Freddie between January 2005 and February 2021, the study focuses on properties undergoing foreclosure, considering them as reliable indicators of property values. The analysis employs a model that examines the relationship between Home Price Index (HPI) growth rates, credit scores, loan-to-value ratios (LTV), loan purposes, property types, and occupancy types.

The model analysis indicates a notable impact around the 80% LTV mark, suggesting a potential link to inflated appraisal in order to skip mortgage insurance. Credit scores also exhibit a significant association with home price changes, particularly affecting subprime borrowers. Furthermore, loans for refinancing, especially cash-out refinancing, show higher discrepancies in appraisal values, indicating an increased risk of fraudulent practices.

Property types and occupancy types also play a crucial role, with manufactured housing, investment properties, and second homes experiencing greater declines in home values, hinting at elevated risks of inflated appraisals in these segments. The study's findings contribute to the understanding of the dynamics of fraudulent appraisal practices and emphasize the need for continued regulatory measures to ensure the accuracy and reliability of property appraisals in the mortgage market.

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INTRODUCTION

In the 15 years following the Great Recession, substantial empirical evidence has revealed a concerning trend of artificially inflated property appraisals during the loan origination process. These inflated appraisals have been identified as a significant contributing factor to the subsequent collapse in the mortgage market. The accuracy of appraisal values plays a pivotal role in credit loss prediction, primarily because the Loan to Value (LTV) ratio significantly influences the probability of loan default and also has a notable impact on Loss Given Default (LGD) forecasts.

LTV holds a central position in the assessment of borrowers' credit risk by underwriters. It directly contributes to determining the interest rates associated with mortgages. Lower LTV ratios not only enhance one's likelihood of securing a mortgage but also result in more favorable interest rates.

Appraisals are performed by licensed professionals known as appraisers, who typically determine a property's value by comparing it to recent similar transactions. This process possesses a degree of subjectivity since appraisers must choose which comparable transactions to consider and make adjustments based on their assessments of property differences. Furthermore, there is a notable bias toward appraising properties at higher values because appraisers are typically hired by originators. A low appraisal can jeopardize mortgage transactions, leading to a higher likelihood of transaction failure. The presence of moral hazard within the appraisal process elevates the potential for fraudulent activity in loan origination. The issue of moral hazard in home appraisals has long been recognized by researchers and professionals in the mortgage industry.

Cho and Megbolugbe (1996) is one of the research papers that using Fannie Mae data shows in 80% of the cases appraisal is around 5% above the transaction purchase price. Agarwal, Ben-David, and Yao (2015) identify appraisal inflation in conforming mortgages and find out that the bias for refinance loans is above 5% and higher for transactions mediated through a broker and mortgages with inflated valuations default more often. Related evidence from Ben-David (2011) and Carrillo (2013) indicates that in some cases transaction prices are also biased upward due to fraud and collusion between buyers and sellers. Griffin and Maturana (2016b) estimate that as many as 45% of non-agency securitized loans have overstated appraisals. Eriksen et.al (2020) find that on average there were 4.2% to 8.3% higher appraisals than the purchase price. Kruger and Maturana (2020), using loan level data from New Century Financial Corporation, showed that there is a difference between property purchase price and Automated Valuation Model (AVM). Based on their analysis, they find that non-agency securitized loan appraisals are on average 5% higher than AVM valuations.

In this research study, we analyze sales price data for properties that have undergone the foreclosure process. It's important to note that the sale prices of these homes may differ from market expectations, primarily because banks and lenders are often motivated to expedite loan liquidation. Additionally, properties subjected to foreclosure proceedings may not have received proper maintenance. Nevertheless, these sales prices serve as dependable indicators of property values.

1 DATA

We analyzed a dataset consisting of 1,036,980 homes that were liquidated from Fannie and Freddie between January 2005 and February 2021. This dataset contains information on various aspects, including the sales price at the time of liquidation, as well as associated costs such as foreclosure expenses, unpaid property taxes, maintenance costs, and accrued interest.

The sales price recorded in the dataset reflects the property's value at the point of liquidation, which we consider to be a reliable indicator of its worth at that time. However, it's important to note that properties liquidated in this manner may often have lower values compared to well-maintained homes, primarily due to neglect and the lenders' urgency to recoup their losses. It is also anticipated that these lenders typically offer these properties at significant discounts in order to facilitate a quicker sale.

The Home Price Index (HPI) is a crucial tool for assessing home price trends in the United States, at both the national, state, and Metropolitan Statistical Area (MSA) levels. This valuable data, sourced from the National Association of Realtors, is meticulously refined and analyzed by Moody's Analytics. Spanning 371 MSAs throughout the United States, the HPI offers a granular perspective, enabling a detailed exploration of home price fluctuations in diverse regions. This granularity is particularly beneficial for discerning the variations in HPIs across different geographic areas within the country.

2 MODEL AND RESULTS:

The dependent variable used in the model is the home price change since origination in percentage. The appraisal value at origination and the sales price at liquidation has been used to derive the home price change since origination and it is compared with HPI growth rate since origination. This is the model estimated:

$$\begin{aligned} &Realized\ Home\ price\ growth\ rate \\ &\quad = \alpha_0 + \beta_1\ HPI\ growth\ rate\ since\ origination + \beta_2\ FICO + \beta_3\ Propert\ type \\ &\quad + \beta_4\ Occupancy\ types + \beta_5 Purpose\ Types \\ &\quad + \beta_6\ State\ dummies\ for\ origination\ before\ 2012 \\ &\quad + \beta_7\ State\ dummies\ for\ origination\ after\ 2012 + \beta_8\ LTV\ at\ origination + \varepsilon \end{aligned}$$

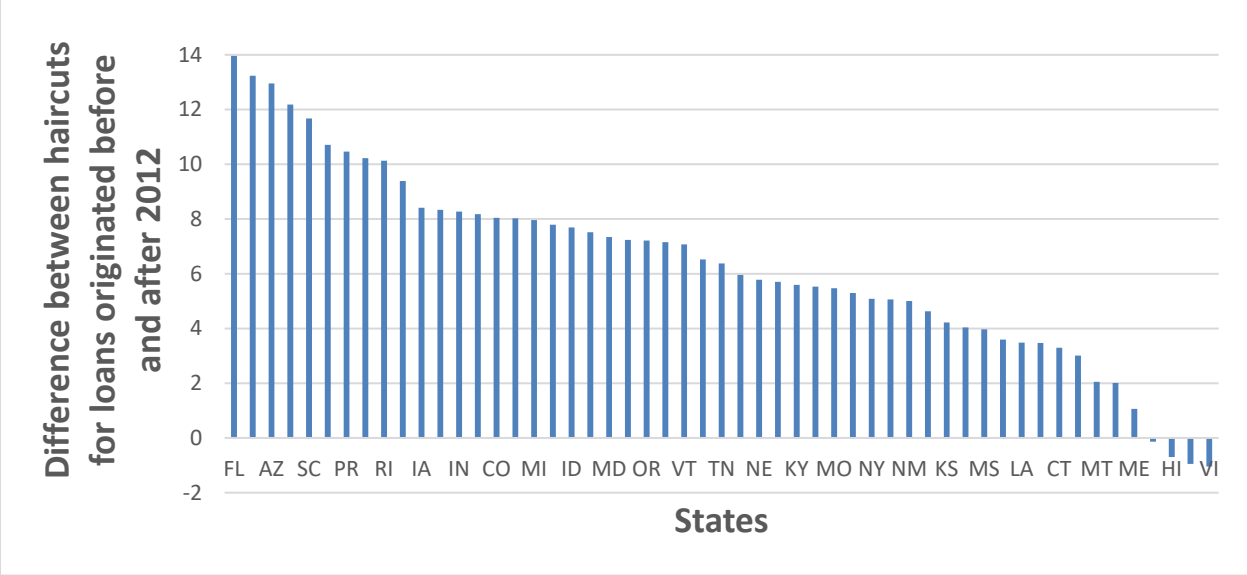
Each of the model's variables may exhibit indications of inflated appraisals, which could be indicative of fraudulent appraisal practices. Existing literature has highlighted that fraudulent appraisals tend to elevate the risk of loan default. Given that the dataset employed in our research comprises loans that have all undergone foreclosure proceedings, it is anticipated that the model will reveal a heightened prevalence of indicators associated with fraudulent appraisal practices.

To address the issue of inflated property appraisals, Government Sponsored Enterprises (GSEs) and the Federal Housing Finance Agency (FHFA) introduced the Home Valuation Code of Conduct (HVCC) as part of the Dodd-Frank regulations. HVCC aimed to enhance the accuracy of property appraisals by creating a clear separation between appraisers and lenders, thereby reducing the potential for undue influence by lenders.

The impact of HVCC is evident when we examine the difference between the actual home prices realized from the time of origination to liquidation for loans originated before and after 2012. Notably, for loans originated before 2012, there was a significant 46% reduction in realized prices compared to for loans originated after 2012, the reduction was 28%. This 18% disparity suggests that inflated appraisals were more prevalent in loans issued prior to 2012. The model is trying to explain the drop in home values from origination date (measured as appraised value) till the liquidation date (which is the sales value of the property at liquidation)

Moreover, this disparity in price reductions varies across different states captured by state dummies in the model, as depicted in Figure 1. For example, in Florida, loans originated before 2012 showed around 14% higher haircut (after controlling HPI changes) relative to loans originated after 2012. Notably, states like Florida (FL), Arizona (AZ), California (CA), and Nevada (NV) experienced the most substantial changes in price reductions after the implementation of HVCC. These states were also the epicenters of the subprime mortgage bubble during the Great Recession.

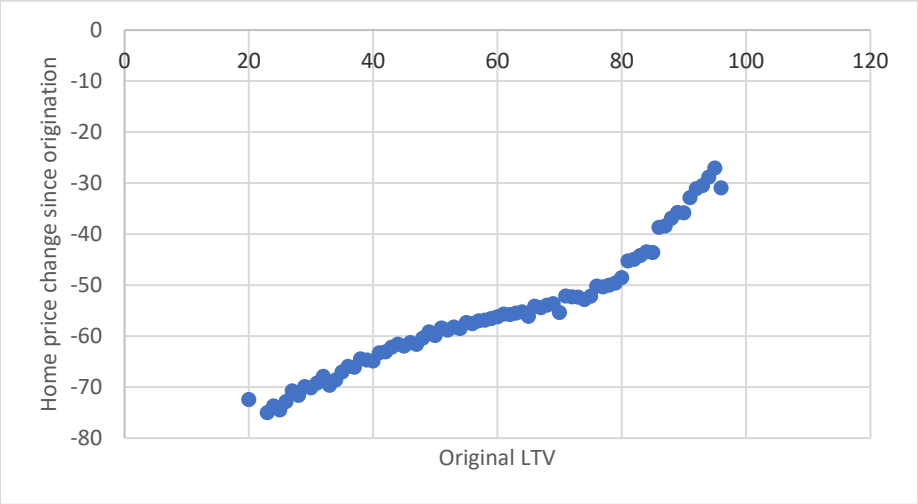
Figure 1: Difference change in haircuts for loans originated before and after 2012



The model indicates a clear positive correlation between realized home price changes and the original Loan-to-Value ratio (LTV). While home price change and LTV seems to be irrelevant but his relationship exhibits statistical significance, particularly demonstrating a notably steeper impact around the 80% LTV mark. It suggests that liquidated loans with lower LTVs that ended up with foreclosure might have experienced a higher incidence of fraudulent activities leading to defaults. This relationship is depicted in Figure 2.

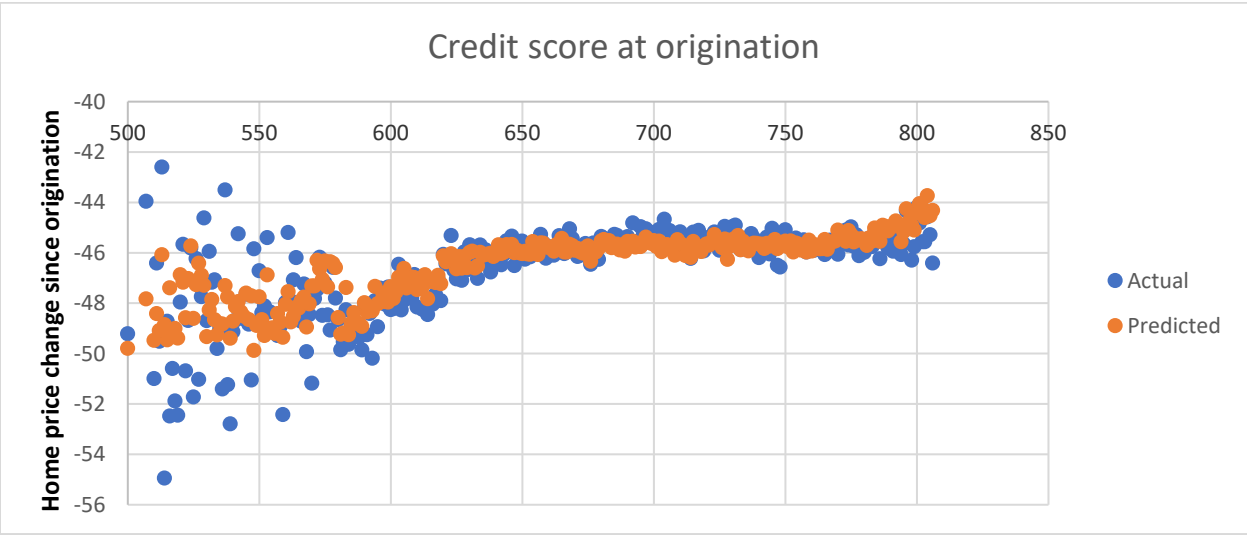
Moreover, other studies have highlighted potential fraud instances, such as the underreporting of secondary liens, falsely categorized as primary liens within the loan records. This misrepresentation could mislead lenders and investors. Notably, the abrupt change observed at the 80% LTV threshold suggests a deliberate adjustment of many loans to reduce LTV values, possibly to evade mandatory mortgage insurance payments or receiving a higher mortgage rate.

Figure 2: Realized home price change versus original LTV



Credit score is another variable that exhibits a significant statistical association with realized changes in home prices. In Figure 3, we present a comparison of actual and predicted home price changes in relation to the credit score at the time of origination. Notably, subprime borrowers experience a more substantial decline in home prices, which is attributed to a greater prevalence of fraudulent activities and overinflated appraisals during the origination process.

Figure 3: Realized home price change versus original FICO score



Another significant variable supporting the findings of various researchers is the loan purpose. It has been observed that mortgages intended for refinancing existing loans carry a higher risk of fraudulent activity. The model indicates that loans aimed at rate refinancing exhibit a 5.4% greater discrepancy in their appraisal values compared to loans intended for property purchase. This discrepancy is attributed to the fact that loans for property purchase are associated with a specific purchase price, making it more challenging to inflate the property's appraisal.

Moreover, loans for cash-out refinancing demonstrate an even higher appraisal discrepancy, standing at 7.8% when compared to purchase loans. This heightened difference in appraisal values can be attributed to the incentive for borrowers to seek higher appraisals in order to extract more money from their homes during a cash-out refinancing.

Within the realm of property types, it's noteworthy that loans utilized for purchasing manufactured housing have experienced a 10% greater decline in home prices compared to single-house properties. This disparity could potentially be attributed to the elevated depreciation rates associated with manufactured housing. Furthermore, the practice of incorporating land value into the property valuation, particularly when the land is not owned by the borrowers, may serve as an additional potential avenue for fraudulent activity. In summary, it is apparent that manufactured housing presents a heightened risk of inflated property appraisals when compared to other property types.

Differences in occupancy types have revealed varying impacts on home prices. Investment properties experienced a more substantial decline in home values, approximately 10% lower than owner-occupied homes. Second homes also saw a notable decrease, with prices falling 4% more than owner-occupied residences. This suggests that investment properties were at a greater risk of having inflated appraisals, while second homes also exhibited elevated risk levels. These particular market segments exhibit a heightened level of risk in the real estate market.

3 CONCLUSION

This research delves into the factors influencing changes in home prices, particularly focusing on variables indicative of inflated property appraisals and fraudulent practices. To conduct this analysis, a dataset comprising liquidated homes from government-sponsored enterprises (GSEs) is utilized. It is important to note that the reported sales prices in this dataset are considered a reasonably accurate representation of property values.

Despite post-Great Recession regulatory actions and anti-fraud initiatives, the data reveals that the incidence of fraudulent activities has decreased, yet not been entirely eradicated. Among the key variables under examination, Loan-to-Value (LTV) ratios, which hinge on property appraisals, stand out as a primary measure of borrowers' credit risk. These ratios play a pivotal role in credit risk modeling. However, a biased or inaccurate LTV can result in an overestimation of credit losses for both lenders and portfolio managers.

Credit risk models should carefully account for indicators that suggest an elevated risk of fraud. Variables such as occupancy types, property classifications, and credit scores serve as key indicators of potential inflated appraisals, thereby increasing the likelihood of default. These factors are systematically assessed and quantified in Moody's Mortgage Portfolio Analyzer, ensuring a comprehensive evaluation of their impact on credit risk within mortgage portfolios.

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