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Question B.1: What kind of fintech activities have the greatest potential to positively impact the housing finance sector? Describe several situations in which a product or service has been or could be used, the factors considered in determining importance, and associated impacts.

The housing finance sector would be in a much stronger position if there were a more objective and rigorous appraisal process that all appraisers followed. Fortunately, the technology needed to produce human-led appraisals that are data-driven is already on the market. Public agencies simply need to require appraisers to leverage these tools. Doing so would result in higher quality appraisals, lower risk for the GSEs and dramatically fewer allegations of bias.

Background

- After comp selection, the adjustment process has the highest impact on the appraiser's final opinion of value.
- The problem is that many appraisers don't base their adjustments on a rigorous analysis of the market or don't make necessary adjustments at all.
    - Typically, the two most important adjustments are those for changes in market conditions and differences in gross living area (GLA) between the comps and subject property.
        - Yet, according to Scott Reuter, the Chief Appraiser at Freddie Mac, appraisers adjust for market conditions or "even try to develop a market conditions or time adjustment" only 20-25% of the time.[1] Even when appraisers do adjust for market conditions, "appraisers appear to be very conservative – applying nominal adjustments that still significantly lag market changes."
        - Meanwhile, data presented by Lyle Radke, the Senior Director of Collateral Policy at Fannie Mae, shows that appraisers tend to make similar adjustments for GLA across the country despite the fact that the median price per square foot varies dramatically across the nation.[2]
            - This uniformity of GLA adjustments suggests that many appraisers aren't developing their adjustments in a principled, data-driven way.
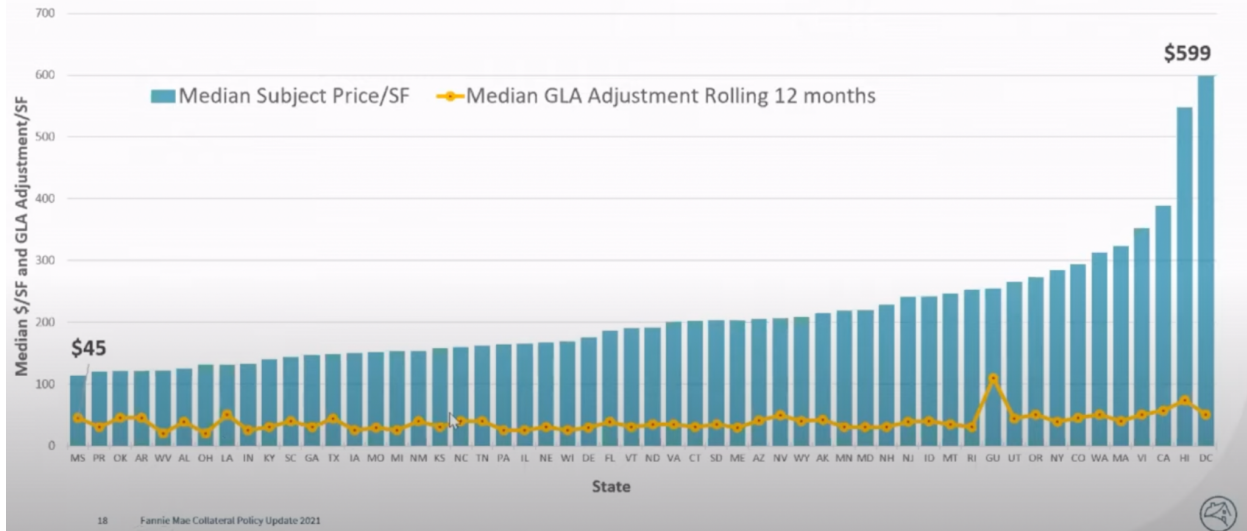
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[1] https://www.youtube.com/watch?v=tvuuxouN1d0&ab_channel=GeorgeDell%27sValuemetrics (31:13 - 34:20)

[2] https://www.youtube.com/watch?v=WcI0P2x4ZMI&ab_channel=GeorgeDell%27sValuemetrics (1:09:33 - 1:11:15)

- The fact that adjustments tend to be overly subjective or even entirely missing reduces the accuracy of appraisers' opinions of value, which in turn increases the risk borne by the GSEs.
    - Moreover, they make it easier for bias to creep into the appraisal and reduce the credibility of the appraisal process in the eyes of the general public.
- That being said, AVMs are not a viable alternative to appraisals because they cannot take into account subjective criteria such as the quality, condition, view and overall character/feel of the home, all of which significantly impact value.
    - This makes AVMs poor at selecting and adjusting comps outside of planned unit developments.
    - Note: While some AVMs are applying computer vision technology to automatically evaluate the quality and condition of properties based on MLS photos, these models have yet to show that they can be trusted.

Recommendation

- Therefore, the GSEs should **<u>require</u>** appraisers to provide quantitative support for the following core set of adjustments:
    - Market conditions
    - GLA
    - Lot size
    - Full bathrooms

- ○ Half bathrooms
- ○ Garage spaces
- Doing so would:
  - ○ Eliminate a significant portion of the issues seen with appraisals
  - ○ Strengthen the safety and soundness of the collateral positions of the GSEs
  - ○ Substantially reduce allegations of bias
- Importantly, the data necessary to make these adjustments are readily available in the vast majority of MLSs and public records databases.
  - ○ And there are many software products on the market today that provide appraisers with data-driven adjustment support. Examples include:
    - ■ Spark and Synapse
    - ■ Gandysoft
    - ■ Redstone by Bradford Technologies

Long-term solution

- True Footage is building an additional adjustment tool that will provide appraisers with more rigorous adjustment support than any of the products that are available today. This tool:
  - ○ Simultaneously adjusts for changes in market conditions and home feature differences, unlike many techniques which analyze each variable one at a time.
  - ○ Does not assume a linear relationship between each variable and sale price.
    - ■ This means it can capture the law of diminishing returns, which is in effect for most home features including GLA, lot size, number of bathrooms and number of garage spaces.
    - ■ It can also handle the common scenario where market conditions have not been changing at a constant rate over time.
      - This is especially relevant today given current market conditions.
    - ■ To the best of our knowledge, this will be the first tool that enables appraisers to make non-linear adjustments.
  - ○ Dramatically increases the amount of data that appraisers can incorporate into their analysis.
    - ■ The number of competing properties that appraisers rely on – typically on the order of 100 – is often insufficient to derive stable and trustworthy adjustments.
    - ■ Our adjustment tool addresses this shortcoming by using machine learning to automatically augment the dataset with additional home sales that may not be as recent and competitive, but would improve our ability to capture the relationships between home features and sale price among the core set of competing properties selected by the appraiser. It does so by:

- Learning the extent to which older competing home sales should be included in the analysis.
- Learning the extent to which the filters selected by the appraiser should be relaxed.
    - For example, if the subject property has 2000 square feet and the appraiser limited the analysis to home sales that have between 1600 and 2400 square feet, the tool would learn whether home sales that have, say, 1500 square feet should be included in the analysis.
- If the appraiser provides a set of alternative submarkets that may contain relevant home sales, the tool would automatically learn the extent to which these home sales should be included in the analysis.

- Testing has shown that this adjustment tool:
    - Learns to use up to ~10 times more home sales in the analysis
    - Produces adjustments that are:
        - more accurate
        - have a much narrower range of uncertainty

About True Footage

True Footage is a residential appraisal company operating in 35 states and working with banks and AMCs to fulfill appraisal orders. The company employs appraisers exclusively, and is extremely focused on bringing new appraisers into the industry. The firm is building data analytics and efficiency software for the entire industry.

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