RESEARCH REPORT

Reengineering the Appraisal Process

Better Leveraging Both Automated Valuation Models and Manual Appraisals

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January 2023

URBAN INSTITUTE · ELEVATE · THE · DEBATE

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Reengineering the Appraisal Process

Over the past year, the federal government has focused on the appraisal process, but proposed changes have been incremental and keep the current appraisal structure in place. In many ways, however, the current appraisal methodology is backward: the appraiser does an appraisal and submits it, and then, in the case of the government-sponsored enterprises (GSEs), the appraisal is checked against their automated valuation model (AVM) to make sure it is within a given tolerance. If not, the appraisal is flagged. For the Federal Housing Administration (FHA) and US Department of Veterans Affairs (VA), there is no automated check of the appraisal values. We propose reshaping the residential real estate appraisal process to start with an AVM value as the baseline, and adjust that value either based on the property's physical characteristics that are not recorded in the data the AVM used or based on the fact that the property data the AVM used are inaccurate. In exceptional cases, the appraiser might decide the AVM is completely inaccurate (e.g., a rural property that is far from other houses and is about to get a freeway exit nearby that will affect its value, or a property that is uninhabitable and requires razing and rebuilding the house), and then the appraiser would revert to the current process. Even then, such exceptions should be easy to monitor and validate.[1]

Our proposal combines the comparative advantages of AVMs and human appraisers. AVMs can leverage the price data of various comparable properties, decide which properties are indeed comparable, and apply any trends in the data at the neighborhood, regional, and national levels.[2] AVMs do not use information about race or ethnicity. Meanwhile, a human appraiser can ascertain whether the data are accurate and can adjust an AVM's valuation to reflect other physical conditions that are not recorded or that an algorithm cannot adequately detect. For example, the roof might be leaking and the furnace might need replacement soon (and thus, the property's actual value might be lower than the AVM suggests), or maybe the current owners finished the basement and installed solar panels (and thus, the property's actual value might be higher than the AVM suggests).

In response to recent news reports and studies that have documented appraiser bias, combined with the Biden's administration focus on racial equity (with homeownership being a primary area of focus), President Biden launched the Interagency Task Force on Property Appraisal and Valuation Equity (PAVE) in June 2021. PAVE consisted of 13 federal agencies (including the White House Domestic Policy Council).[3] Representatives of these agencies held frequent meetings, and within some of the agencies, additional work was done (including production of new publicly available data to help study appraiser bias).[4] The results of the efforts of the task force, the PAVE Action Plan, released in

March 2022 (PAVE 2022), makes recommendations to improve the appraisal process to eliminate the potential for bias.

We view our proposal as a straightforward step toward achieving many of PAVE's goals, but by reordering the appraisal process, the timeline can be accelerated and the long-term results will be superior. We believe our proposal could be implemented within the next two years. In particular, much of our proposal can be implemented by three agencies that are already part of PAVE.[5] We do not believe that the proposal would require congressional approval, and it might not even require major rulemakings. Moreover, the Appraiser Subcommittee that oversees the real estate appraisal regulatory framework for federally related transactions has seven member agencies, and each one is part of PAVE.[6]

In this report, we make a case for our proposal. We first discuss research on the accuracy and biases of the current appraisal process versus the accuracy and biases of AVMs. We then look at the rationale for our proposal. We then look at the history of appraisals and how we got to this point. Finally, we discuss how our proposal would be implemented, what developments would be complementary, and what we expect to see in the years ahead.

Research

Several strands of research are relevant to this discussion.

1. AVMs on their own are at least comparable in accuracy and are perhaps more accurate than the current appraisal process.

2. There is an abundance of anecdotal evidence on appraiser bias. The more nuanced and more difficult questions are the magnitude and prevalence of this bias.

3. AVMs do not have an explicit bias, but their higher error rate in majority-Black areas deserves attention.

AVMs on Their Own Are At Least Comparable in Accuracy and Are Perhaps More Accurate Than the Current Appraisal Process

We discuss some of the recent research on appraisal accuracy and the effects of potentially inaccurate appraisals. For purchase transactions (when the appraiser knows the home's agreed-upon sales price ahead of the appraisal), AVMs are considerably more likely than human appraisers to provide true

valuations. For refinance transactions (when the appraiser does not know the home price), the evidence is mixed; some older data suggest that appraisers might have been more accurate, but more recent studies disagree. Regardless, we propose a regime that would combine the best of both methods and thus should be more accurate than stand-alone AVMs.

The key feature of human appraisals for real estate is that the appraisers know the agreed-upon transaction price for purchase transactions. Accordingly, a disproportionate number of homes are appraised exactly at the market price, with some appraisals receiving a somewhat higher or somewhat lower evaluation. It is theoretically possible that appraisers are good at evaluating the price that the home would eventually get in a real estate transaction, and so the appraised value distribution would look like that regardless of the appraisers knowing the transaction value. But that is not what the data show.

Researchers from Fannie Mae analyzed residential real estate transactions that happened to receive two appraisals in a span of a few months (without notable work done on the homes in the meantime) (Eriksen et al. 2020). The first appraisal was done without the appraiser knowing the price at which the home would sell, which is an unusual situation. The second appraisal was done with the appraiser knowing the transaction price, which is the typical situation. Figure 1 shows the results. In the panel on the left (i.e., the appraiser does not know the eventual price), there is a smooth distribution of appraised values around the eventual contract price, with some undervaluing. In the panel on the right (i.e., after the appraiser knows the sales price), more than 30 percent of the appraised values are exactly at the contract price, and the vast majority of appraised values are higher than the contract price, with a trickle coming below the contract price. These findings still hold; as a part of the PAVE process, the Federal Housing Finance Agency (FHFA) recently released aggregated statistics on appraisals that also show that in 2021, about 15 percent of homes were appraised under the contract price, 25 to 30 percent were appraised at the contract price, and the vast majority were appraised above the contract price.[7]

Researchers found that mortgages on homes receiving the valuation of exactly the contract price are somewhat more likely to default eventually, suggesting that the spike at the contract price in the panel on the right is artificial and might have harmful effects (Calem et al. 2020).[8] It also appears that the mechanism by which appraisers justify this valuation is through their selection of comparable properties (Fout 2017).

On the other hand, appraisals that are below the contract price (the left tail in the panel on the right) often lead to price renegotiation and a lower purchase price (Fout and Yao 2016). A lower sales

price, all else equal, leads to faster equity accumulation and lower monthly payments (and thus, a lower likelihood of default).

Appraised Value and Contract Price
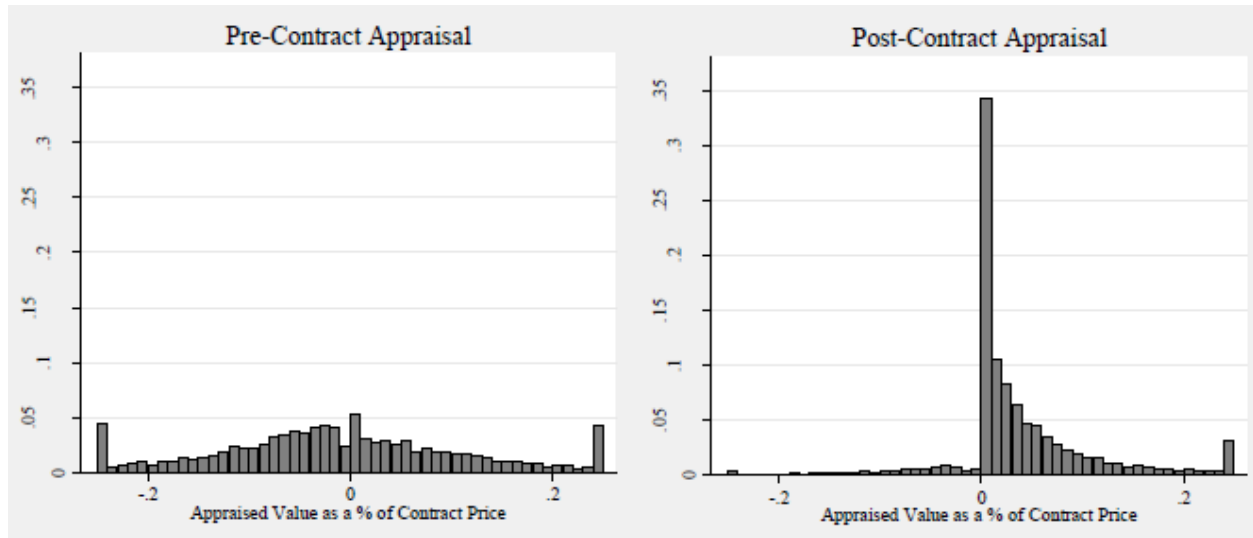
Source: Hamilton Fout, "Appraised Values and Contract Prices: Overview of Recent Research Using Uniform Appraisal Data" (Washington, DC: Fannie Mae, 2017).[9] Used with permission.

Given the dynamics in figure 1, evaluating AVMs against appraisers for purchase mortgages is almost meaningless. Any AVM is highly likely to produce a distribution similar to the left panel, as AVMs are trained to predict the eventual contract price, without being exposed to it in training (or to the list price). A more meaningful comparison, though not often performed, is in refinance transactions. Freddie Mac researchers find that although the home value based on their AVM was as good at predicting eventual mortgage default as human appraisers from 2000 to 2009, the human appraiser value became more useful for prediction from 2009 to 2014 (Liu and McManus 2020). Other researchers, using GSE data from 2013 to 2017, find comparable accuracy (Krivorotov and LaCour-Little 2021). Using newer data (from 2017 to 2020), Freddie Mac researchers (including one of the coauthors of the previous Freddie Mac study) find that the AVM is more predictive (Karamon and McManus 2022). This may reflect improvements in AVMs over time.

Rural areas are notorious for having few comparable properties nearby. This complicates both human appraisals (and makes them more expensive, as they require appraisers to drive longer distances) and AVMs (because of the relative dearth of data).[10] FHFA researchers document a high frequency of appraisals much higher than the contract price and estimate different AVMs as potential

solutions, suggesting hedonic approaches (Bogin and Shui 2020). Tribal areas are likely to suffer from the same issues. More research is needed on comparing AVM and appraiser performance in rural and tribal areas, which should be easier with the FHFA's recent data release.[11] For our proposal, it is possible that the appraisers will completely overrule the AVM more frequently in rural and tribal areas, forcing comparatively more focus on these important areas by the credit risk holders and AVM developers.

Evidence of Appraiser Bias

There is an abundance of anecdotal evidence on appraiser bias. The more nuanced questions, which researchers have not yet answered clearly or persuasively, are how prevalent this bias is (is it occasional or pervasive?), what is the magnitude of this bias (are homes with Black owners undervalued by 1 percent or by 20 percent?), and how much of the bias is reflective of wider disparities as opposed to an appraiser's racial biases? We discuss some recent evidence.

In the past few years, there have been multiple reports of appraisers exhibiting racial bias.[12] These reports are so frequent that there is almost a template: a Black family's home gets an appraisal, the appraiser reports a home value dramatically lower than a reasonable market value, the family requests another appraisal while removing evidence of race (e.g., family photos) and asking a white friend to be in the home instead of them, and the new appraised value is dramatically higher (and is in line with the market). Such anecdotal evidence from the news reports is supported by evidence of racial and ethnic references that appraisers use in their reports.[13] Such evidence is also supported by a study using matched-pair testing with 14 appraisals and four interracial couples (comparing the results depending on the partner who was present during the appraisal and the corresponding photos present or removed), finding that Black partners received lower home valuations, encountered unprofessional behavior, and in one case had to wait 11 weeks for their report (Lilien 2022). The matched-pair study was a comprehensive attempt to analyze appraiser bias, but it is still based only on 14 appraisals, and it is hard to make quantitative conclusions.

Korver-Glenn (2021) details shadowing and interviewing dozens of housing market professionals in their work interactions in Houston around 2015. Chapter 5, devoted to appraisers, focuses on comparables (i.e., comparable properties) selection and includes a discussion of explicitly racist parts of the beginnings of the comparable sales appraisal approach. Further, numerous passages from appraiser interviews highlight two main issues. First is appraisers' reliance on selecting comparable neighborhoods based on a view of a "typical" consumer (whom appraisers tend to view as white).

Second is that neighborhoods are defined in a way (by appraisers but with assistance from the Houston Association of Realtors) that ensures a tailored approach for majority-white areas, while lumping areas that are either majority-Black or majority-Latino into bigger neighborhoods, without attempting to tailor for differences in income or other characteristics.

There is mixed statistical evidence on the magnitude of this problem. Brookings Institution research suggests that homes in majority-Black neighborhoods are undervalued by more than 20 percent, controlling for more than 20 home and neighborhood characteristics (Perry, Rothwell, and Harshbarger 2018). But American Enterprise Institute follow-up research suggests that much of the difference the Brookings researchers documented disappears once they control for a couple more characteristics (e.g., one adult versus multiple adult borrower shares and how many households are headed by single mothers).[14] Both Brookings and the American Enterprise Institute released follow-ups, suggesting that their respective points hold up with more analyses.[15]

Regardless of whether and how much of the evaluation gap Brookings identified exists, a more nuanced question is how much of that gap is attributable to appraiser bias.[16] There are multiple reasons for why homes in majority-Black neighborhoods might be undervalued relative to homes in majority-white neighborhoods, and appraiser bias is only one of them. Other reasons might be variables omitted from the analysis because they are virtually unobtainable for the entire country (e.g., nuanced measures of real or perceived school quality or community amenities[17]) or implicit or explicit bias from homebuyers who might not want to live in majority-Black neighborhoods (which would lower home prices in majority-Black neighborhoods but could look like appraiser bias in the data).

Recent research by Fannie Mae and Freddie Mac attempts to identify racial bias stemming from appraisers in particular. Fannie Mae finds minor appraiser bias (using refinance appraisals), and Freddie Mac finds more bias (using purchase appraisals). Fannie Mae researchers compare appraiser valuations with AVM valuations and find evidence of minor biases: examining appraisals for refinances for white versus Black homeowners in predominantly white and predominantly Black neighborhoods (i.e., four cases overall, each of the four for two different AVMs) shows that, on average, almost all groups are evaluated within 1 percent of either of the two AVMs used (Williamson and Palim 2022). There is a small tendency for Black borrowers' homes to be undervalued (by less than 1 percent, on average). There is also a tendency for white borrowers' homes to be overvalued in majority-Black neighborhoods (by almost 2 percent relative to one of the AVMs and by less than 1 percent relative to another AVM). The study's setup suggests that Fannie Mae's researchers believe that the AVM quality is good enough to be used as the unbiased accurate standard relative to human appraisals.

In contrast, Freddie Mac's research finds that appraisals below market price for purchase mortgages are almost twice as common for majority-Latino communities than for majority-white communities (15.4 percent versus 7.4 percent) and are higher for majority-Black communities (12.5 percent) (Narragon et al. 2021).[18] The FHFA documents similar findings.[19] Given the skewed distribution from figure 1, it is hard to evaluate what such below-market appraisals mean and how they affect consumers. We do not know whether that evaluation is accurate, and although below-market appraisals make it harder for sellers to sell their homes and can deprive sellers the opportunity to maximize their wealth accumulation, below-market appraisals might make housing more affordable for buyers, as buyers are likely to negotiate the contract price down.

Academic researchers also analyzed data from 2000 to 2007 that contain appraisers' names, allowing the researchers to infer the appraisers' race or ethnicity (however imperfectly). The researchers found that Black and Hispanic homeowners had their homes undervalued by 0.7 to 0.9 percentage points relative to white homeowners (with the differences measured by comparing with the AVM values, which tend to be lower, on average, than the appraisal values). These differences remained regardless of the appraisers' race or ethnicity. The authors also find evidence suggestive of an implicit bias of the AVM, but that bias appears to be considerably smaller than that of the appraisers (Ambrose et al. 2022). American Enterprise Institute researchers find similar undervaluation by appraisers in their specifications: less than 1 percent in most specifications, once the researchers attempt to control for unobservable variables (Pinto and Peter 2022).

AVMs Do Not Have an Explicit Bias, but Their Differential Error Rates Deserve Attention

Compared with research on appraiser bias, less research had been done on AVM bias. AVMs do not have any explicit bias, as race and ethnicity are not inputs. The Urban Institute analyzed an AVM and showed that the AVM does not, on average, overvalue or undervalue properties in majority-Black neighborhoods relative to the homes' contract prices (comparing with majority-white neighborhoods and those homes' contract prices) (Neal et al. 2020).[20] But the Urban Institute found that there is more variability and deviation from the mean in majority-Black neighborhoods, a trend that is still present after controls for property condition.

An AVM does not know the race or ethnicity of the family living in a particular home or even whether the neighborhood is predominantly Black or Latino. In contrast, discussing Lilien (2022), the

National Community Reinvestment Coalition's counsel explicitly singled out the role of comparables selection in providing the opportunity for implicit or explicit bias to slip in.[21]

Allowing the AVM to select comparables is likely to produce accuracy similar to letting appraisers select comparables, especially for purchase transactions (it is arguably more important from the consumer perspective). Such an approach would also make it easier to monitor any implicit biases in AVMs, as firms are already starting to use AVMs to monitor appraisers' comparables selections.[22] In general, it will be dramatically easier to monitor both the accuracy and the biases in comparables selections by a handful of AVMs (with a Dodd-Frank Act–mandated rulemaking already in progress[23]), rather than trying to monitor tens of thousands of human appraisers (Kleinberg et al. 2020). A side effect of this process could be to shift more regulatory burden on the federal government to regulate AVMs, relative to the current appraisal regulation at the state level.

Moreover, regulation, monitoring, and research can then focus on more nuanced issues, such as a higher likelihood of error in majority-Black neighborhoods. Such a finding—no bias, on average, but higher likelihood of error (in either direction) for the groups not as represented in the data—is often encountered in statistical modeling. Solutions are often not satisfying. The modeler could effectively discard enough data from the larger group so that the accuracy becomes lower for the larger group too, and thus there is no discrepancy. Alternatively, the modeler could use the information on which neighborhoods are minority neighborhoods in modeling, but that practice might be perceived as a fair lending and fair housing risk. We hope for more research on potential solutions and more leeway from regulators allowing for experimentation (e.g., using race and ethnicity data to select a more equitable model for development, even if the race and ethnicity data are not used for prediction). There might also be differences in omitted variables (e.g., home conditions) that could become easier to control for once appraisers are recording such variables to justify departures from AVM valuations.

Rationale for the Proposal: Artificial Intelligence + Human Inputs Are Better Than Either One Alone

We have shown that AVMs are already at least comparable and likely more accurate than full appraisals and will become more accurate with time. AVMs also do not know the race of the family living in a home, and it is easier to monitor differential error rates or even implicit biases of a handful of AVMs than to do so for tens of thousands of individual appraisers (and appraiser management companies). But even the best AVM algorithm is no substitute for human judgment (at least in the foreseeable future) when

checking the physical condition and other features not recorded in the Multiple Listing Service and other datasets (sometimes, the information in these datasets is outdated or otherwise inaccurate). We believe that the combination we are proposing will solve many problems, improve accuracy, potentially decrease costs, and set the appraiser industry on the right trajectory.

The proliferation of artificial intelligence and machine learning has highlighted areas where statistical algorithms benefit from human involvement. Combinations of statistical algorithms and humans range from increasing precision in models (by humans labeling previously unlabeled data or flagging outliers that should not be used) to humans providing stylistic input into artistic applications such as Deep Art or music (choosing the subject of a painting to be generated in a particular style); art generated by computer-human combination won an art fair when the judges were not aware of computer involvement.[24]

Truck driving, a key component of the US economy, is another example. Fully self-driving trucks are likely decades away. But there is increasing interest in a hybrid model: vehicles drive themselves on freeways, and a human driver takes control in cities. This hybrid system uses comparative advantages from both sides: the algorithm behind self-driving does not get tired, and human drivers are better at navigating unexpected occurrences during the journey's last-mile component.[25] Similar interaction happens already even in less automated passenger cars; drivers rely more on software to reduce the driver's workload, especially for freeway driving without particular dangers, but they take control in situations that are less safe.[26]

In all the examples above, we do not need all humans in the loop to understand the details of the statistical modeling. Drivers do not know the intricacies of assisted driving algorithms; artists, musicians, and translators do not know the intricacies of transformer or generative adversarial network architectures that drive the algorithms behind the software they are using. Similarly, we expect the appraisers to broadly understand what kind of data are used in the AVM and what the AVM can and cannot do. But we do not require appraisers to take statistics and machine learning courses.

Just like with driving, it is possible that one day, a customer can take photos inside and outside the home and upload the photos, and a machine learning algorithm will tell the customer and the lender whether the roof is leaking and whether the square footage is indeed as recorded.[27] But we are far from that day. The solution is to use the technology that we have for what it is designed to do—provide a tested set of comparables and extrapolate from all the data that are being used—while giving human appraisers tasks that are currently harder for algorithms to accomplish, and using human appraisers as a

fail-safe mechanism, as it will be obvious to a human appraiser if the algorithm makes a catastrophic error.

History of the Appraisal Process: We Are Solving Problems of the Past, Not Focusing on the Future

The current appraisal regime, and its emphasis on appraiser independence, is an outcome of the savings and loan crisis in the 1980s and the resulting Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) regulation.[28] Appraisal issues are not often cited as the main cause of that crisis,[29] but they were a contributing cause. FIRREA tried to fix those problems.

The situation was dramatically different in the 1980s and the 1990s. We had a different secondary mortgage market. Back then, many small financial institutions held mortgages in portfolio; today, most of the market consists of securitized loans insured or guaranteed by Fannie Mae, Freddie Mac, the FHA, and the VA. We also did not have the AVM technology that we have today. Thus, sticking too closely to the path charted in the aftermath of the savings and loan crisis is unproductive for taking the industry into the future. We are not much closer to solving appraiser accuracy (and bias) problems now than we were 30 years ago, as evidenced by the following passage from the *New York Times*, which was written in 1990 but is applicable today:

> Perhaps the biggest problem for appraisers is that making an appraisal today is more difficult than at any time in memory. One reason is that the number of sales has slowed dramatically in many regions, making it much harder to find comparable sales data. Another is that the value of property has declined and may continue to sink. "For appraisers, double-digit inflation hides a multitude of sins," said Mr. Bunton of the Appraisal Foundation. "But in a declining market, no one knows when we will hit bottom. It requires appraisers to also play the role of economists, and no one can be very comfortable with that."[30]

The AVM technology has made our proposal possible from a technical perspective. There is relatively little information on AVM accuracy before the 2000s, and various statistical approaches have become popular since then, allowing for improvements. The concentration of mortgage credit risk into relatively few parties (the FHFA, the FHA, and the VA) allows for easier implementation.[31] Our proposal is good for prudential reasons as well. AVMs are far from perfect, but monitoring and improving a handful of AVMs related to how well their values predict eventual default is easier than monitoring and improving the accuracy of tens of thousands of appraisers. Appraisals at the contract price result in higher default rates, and thus, moving to an AVM-based standard will improve safety and soundness, especially while giving human appraisers the option to override AVM valuations.[32]

During the pandemic, several secondary market actors allowed desktop appraisals for some transactions—the appraiser does not have to physically visit the home (or, at most, has to drive by the home), but the appraiser still selects the comparable properties and arrives at a home value based on that.[33] We believe this is the wrong direction, as it does not allow the human appraisers or the AVMs to shine. The appraisers' comparative advantage is exactly what is not in the data that they could get through their desktop. The appraisers' comparative advantage is not coming up with an evaluation model, when an AVM was developed by economists, statisticians, and machine learning scientists and was trained and back-tested on millions of transactions and billions of data points. So even though desktop appraisals allowed appraisers to stay home during the pandemic, we consider this a pandemic-driven detour as opposed to a permanent solution.[34] A potential upshot of desktop appraisals (outside of a pandemic) is that it limits or eliminates the interaction between the appraiser and the homeowner, in turn reducing or eliminating racial bias. But the racial bias can still exhibit itself based on the property's location (and the appraiser's beliefs about the neighborhood), and given all the evidence above, a value based solely on an AVM is likely more accurate and more cost effective—in a sense, the next logical step after desktop appraisals is eliminating human appraisers altogether.

In addition, since 2016, the GSEs have attempted to move more of their quality control up front before the loan closes, giving originators time to correct the deficiency. As part of Day 1 Certainty, Fannie Mae offers income, asset, and employment validation services to lenders through its automated underwriting engine, Desktop Underwriter. Freddie Mac offers the same service through its Loan Product Advisor. In addition, both Fannie Mae and Freddie Mac will provide freedom from representations and warranties on appraised values and enhanced waivers of property inspection requirements on refinances. The up-front waivers on the appraisals are done by comparing the property's appraised value with the GSE AVM, flagging appraisals that are out of line with the AVM.[35] Our proposal simply pushes this development one step further and starts the appraiser out with better information yet still allows the appraiser to exercise human judgment.

Our proposal complements other PAVE initiatives. Ongoing initiatives that are likely to improve outcomes include strengthening the Appraisal Standards Board's Uniform Standards of Professional Appraisal Practice requirements,[36] releasing more data on appraisals,[37] encouraging more cooperation across federal agencies (and referrals to state authorities),[38] interagency rulemaking on AVMs (CFPB 2022b), streamlining procedures on borrower requests for appraisal reviews,[39] implementing the Appraiser Diversity Initiative,[40] and rethinking the "byzantine" structure of appraisal oversight.[41]

Implementation: The Appraiser's Critical Role and AVM Selection and Regulation

Appraisers Still Play a Critical Role

We are not suggesting that appraisers do anything dramatically new. In particular, the FHA already requires appraisers to check for "standing water against the foundation and/or excessively damp basements; hazardous materials on the site or within the improvements; faulty or defective mechanical systems (electrical, plumbing or heating/cooling); evidence of possible structural failure (e.g., settlement or bulging foundation wall, unsupported floor joists, cracked masonry walls or foundation); evidence of possible pest infestation; leaking or worn-out roofs." Appraiser requirements also include checking "if mechanical systems do not appear: to have reasonable future utility, durability, and economy; to be safe to operate; to be protected from destructive elements; or to have adequate capacity. The Appraiser must observe the physical condition of the plumbing, heating and electrical systems. The Appraiser must operate the applicable systems and observe their performance. If the systems appear to be damaged or do not appear to function properly, the Appraiser must condition the appraisal for repair or further inspection" (HUD 2022, 570–87). Similarly, appraisers are required to account for various external factors (e.g., noise from nearby traffic or airplanes). The VA has similar requirements; for example, even though the appraiser is not required to test electrical systems, "[a]ny visible frayed or exposed electrical wires must be repaired" (VA, n.d., 12-19). The requirements for heating, roofing, and water supply are similar to the FHA's requirements. We believe that as appraisers focus on features that AVMs cannot observe, the appraisal requirements will start to include more of the features typically associated with home inspections. This change in focus could also lead to more quantification and data-driven approaches to recording and valuing physical condition (e.g., noting that the roof needs replacement in a certain number of years, as opposed to noting that the roof condition is poor).

Appraisers are already required to take photos and upload them. Thus, documenting conditions that will not be in the data available for AVMs, taking photos showing evidence of such conditions, and adjusting the AVM value based on these conditions are all things appraisers do.

As the focus shifts on observing such conditions, we expect that the existing appraisers and appraisers' training might become even better at detecting various issues and valuing the amounts required to, say, fix electrical system issues. Such a pivot could also allow for a shortened course of study and a shorter apprenticeship period. In turn, this pivot could allow for an inflow of new appraisers with backgrounds in home inspection, subcontracting, and trade schools.

A lack of appraiser representativeness and the field's potentially excessive entry requirements (leading to a shortage of appraisers) are well publicized. The White House released a fact sheet (on PAVE's Action Plan) documenting that 97 percent of appraisers are white and that the profession has "unnecessary educational and experience requirements."[42] Allowing appraisers to start with an AVM would save time, allowing appraisers to cover more properties per day. This opens the field for an additional category of appraisal associates, a role that would require less training, and would permit certified appraisers to do primarily the property condition adjustments.

Our proposal might also allow for more cost-effective appraisals, which would address another sticking point.[43] From unrepresentative surveys and questionnaires, it appears that appraisers spend four to seven hours on each appraisal.[44] It also appears that most time is spent in the office and that a key portion of this time is analyzing comparables. One survey respondent noted, "Finding and selecting the right comps, I believe, is the most important part of the appraisal. Looking at multiple docs requires my using 2 screens and, unfortunately, killing more trees for work file copies. It is only possible to do this in office."[45] Cutting down the time required for each appraisal by an hour could save at least $100 per appraisal (appraisals currently cost $600 or more).

AVM Selection

Which AVM should appraisers use? If a wide range of models were acceptable, and the lender could check several alternatives, the process could become a race to the bottom toward finding the most aggressive AVMs. Moreover, the bearer of the risk might not be comfortable with the selected model. We believe that the most powerful alignment of interests is achieved by allowing the risk holder to decide which AVM should be used. For example, Freddie Mac could require the use of its Home Value Explorer, while a portfolio lender might select another AVM. Any AVM would have to be compliant with the ongoing AVM rulemaking once it is finalized; moreover, bank lenders who place mortgages in their portfolio have the value of these mortgages checked by auditors and bank examiners. We recognize that our proposal implies that the appraisal management firms will have to be familiar with several AVMs.

Practically, the FHA and the VA do not appear to have internal AVMs, but at least in the short term, Freddie Mac's AVM is available for free to lenders using its services and is available for a fee through select vendors. The FHA and the VA could default to that arrangement until they decide to select different AVMs (or Ginnie Mae could make that selection). For private-label securitizations, AVMs used in valuation should be identified in the offering material.

To reiterate a broader point, regardless of the AVM the risk holder chooses, we believe the appraiser should always be able to override an AVM's valuation when the appraiser believes the AVM is off and record why the AVM was wrong (ideally to improve future AVM performance).

AVM Regulation

Our proposal is consistent with appraiser independence requirements and with ongoing AVM regulatory efforts. Among other provisions, appraiser independence requirements prohibit lenders from requiring or providing incentives to the appraiser to arrive at a specific valuation (e.g., a value that would let a transaction go through).[46] But the largest secondary market actors—Fannie Mae, Freddie Mac, the FHA, and the VA—are not covered by these requirements.[47] Thus, it is not surprising that each of these secondary market actors has a detailed guide describing how to do an appraisal.

Having an appraiser use a client-requested AVM is also explicitly permitted by the Appraisal Standards Board and does not interfere with appraiser independence requirements (even if the client is not exempt from appraiser independence requirement).[48] But the appraiser needs to learn how the model works (not the statistical underpinnings but which main inputs it uses) and decide that the model is applicable. The largest secondary market actors can work with the Appraisal Standards Board to have a succinct description of their preferred AVM and later introduce material on these AVMs as a part of each appraiser's training.

AVMs also need to be regulated, and a rulemaking is under way (CFPB 2022a). Adopting our proposal, and having each appraisal start with an AVM valuation (in lieu of more manual comparables selection) makes it easier to control the appraisal process and can be adjusted. In contrast, trying to implement any regulatory changes individually for tens of thousands of appraisers under the current regime would be difficult, expensive, and hard to monitor. We believe such a rulemaking should address the way AVMs get validated, standardize the requirements for reporting standard errors around AVM valuations and how such standard errors are to be calculated (Gordon 2005), and ensure that data are frequently updated (e.g., monthly). Ideally, either the rulemaking itself or further guidance would incorporate accepted model development guidance standards, potentially somewhat updated for the AVM context and for machine learning advances (OCC 2011).

Thus, our proposal can be adopted by Fannie Mae, Freddie Mac, the FHA, and the VA by changing the language in their existing appraisal guidelines, as it relates to arriving at a preliminary value estimate using an AVM (in lieu of comparables), and adjusting that value only to reflect any data the AVM does not capture. Each appraiser can override the AVM when the appraiser does not believe the

AVM can be used in a particular case, but such an override (especially resulting in a materially lower value than the AVM's) should be used only under exceptional circumstances and should invite scrutiny, with infrequent occurrences making it easier to follow up on a large percentage of them. The secondary market actors can also adjust their forms by requiring the date of the AVM run (and potentially a screenshot), the value received, and a list of additions and subtractions to that value and the reasons for them (e.g., lowering the valuation by $10,000 because of a leaky roof), ideally with photographic evidence (the current process already requires some photos).

Complementary Developments and Moving toward the Future

Encouraging More Involvement from Appraiser Trainees

Each property needs a value verification, and it is understandable why FIRREA was written as it was in 1989, with licensed appraisers playing a central role in the process. But today, we have more data and better AVMs. The combination of AVM values, AVM confidence intervals, sales prices, and loan-to-value (LTV) ratios can separate properties for which more care and investment in appraising are warranted. In particular, for "safer" properties (those with low LTV ratios and narrow AVM confidence intervals), appraisers should be encouraged to allow appraiser trainees to perform the property inspection and fill out most of the forms; the appraiser can then validate the trainee's work. Currently, appraisers typically do not have such a choice, and it causes appraiser shortages, more expensive appraisals, and a less comprehensive training experience. Fannie Mae, Freddie Mac, the FHA, and the VA are updating their guides to allow appraisers to sign off on trainees' work (as opposed to performing everything in person themselves), which would streamline the process.

Moving to a Three-Category Risk-Based Approach

Ideally, we would push the idea of combining AVM values, confidence intervals, sales prices, and LTV ratios further to rank properties by risk of value even further. We can envision an automatic selection into three risk categories. Based on these (and other factors),

1. the riskiest properties would get a full appraisal by a licensed appraiser;

2. properties with an intermediate level of risk could get an in-person appraisal by an appraiser trainee, and a certified appraiser would approve the trainee's work (using photos or videos the trainee can take, and with the licensed appraiser visiting the property if the case is more complicated than expected); and

3. the safest properties might not need appraiser involvement and should receive an appraiser waiver, with the valuation solely based on the AVM.[49]

As technology evolves to allow for image and video processing to gauge conditions inside the property, and as training improves and data availability increases (e.g., better coverage and unique identifiers for condominiums that cannot rely solely on latitude and longitude), we expect that properties will increasingly transition from buckets 1 and 2 into buckets 2 and 3. This will increase speed, decrease costs, and reduce racial and ethnic bias. The risk holder has the appropriate incentives to decide on the appropriate rules for when a property is in what bucket, and prudential examiners can monitor these choices.

Incorporating Valuation Uncertainty

Neither human appraisers nor AVMs will be able to perfectly predict a home's value, and each evaluation method has wide confidence intervals.[50] Yet financial institutions use these valuations for precise decisions, such as deciding whether the LTV ratio is 80 percent, and even a minor deviation can trigger either a higher down payment than anticipated (potentially putting the transaction at risk) or mortgage insurance.

The combination of noisy valuations and severe consequences for valuations below the proposed transaction price result in figure 1, with human appraisers bunching at the proposed transaction price when they know it. That is, many appraisers produce values as if they adjusted comparable weights to exactly match the market price. We do not believe that appraisers think that an unbiased noisy valuation process magically leads to exactly the same number as the proposed transaction price. Instead, we believe that appraisers anchor at that valuation because they defer to the market price (unless it looks off) and because of the severe consequences of even a slightly lower appraised value.[51] Not surprisingly, human appraisals for refinance loans (when the market price is unavailable and there is no mark to miss) are more informative and less biased.[52]

The question should not be whether the noisy value produced by the process (whatever the process is) pushes the LTV ratio to 80 or 80.01 percent—that is clearly false precision, given the range of

plausible values. A better process might be to check whether the appraised value (through whichever method) is consistent with, say, an LTV ratio of 80 percent, given all the errors embedded in the process and how consistent it is (is it highly likely that the LTV ratio is at most 80 percent, is it somewhat unlikely, or is it almost impossible?). Such a process would result in explicitly capturing the confidence interval in the estimation.

Fannie Mae's Collateral Underwriter is moving in that direction by flagging which property values are likely to be overvalued or undervalued and how risky such overvaluations or undervaluations are. We believe risk holders have the right incentives to decide how exactly to implement such a system and which calculations should be made, with prudential regulators watching over nongovernment entities.[53]

Conclusion

Despite the time spent reevaluating the appraisal process, there has been no discussion about redoing the process to allow the appraiser to start with the AVM in lieu of more manual selection of comparable properties. Our proposal would capitalize on the respective strengths of human appraisers and of the AVMs. We hope this report begins that conversation.

Notes

1   We describe details below, but we envision each credit risk holder (e.g., Fannie Mae, Freddie Mac, the FHA, and the VA) will recommend an AVM for appraisals on their properties, and the appraiser will receive the AVM value from the lender. The appraiser, upon checking the AVM description, decides whether the AVM value is applicable: if so, they examine the home's other physical characteristics and adjust the AVM accordingly; if not, they do a full appraisal as they do now and record the reasons for overruling the AVM.

2   Appraisers' selection of comparables is arguably the main mechanism that allows bias to affect the home valuation. For example, at a Brookings Institution event (see "Examining Racial Bias in Home Appraisals: Screening of *Our America: Lowballed*," Brookings Institution, last updated January 12, 2023, https://www.brookings.edu/events/examining-racial-bias-in-home-appraisals-screening-of-our-america-lowballed/), Julian Glover, director of the documentary *Our America: Lowballed* (see Julian Glover and Mark Nichols, "Our America: Lowballed," ABC7, accessed January 30, 2023, https://abc7news.com/feature/our-america-lowball-home-appraisal-racial-bias-discrimination/12325606/), noted that appraisers fabricated comparable properties to get to a lower valuation. At the same event, Lisa Rice, who leads the National Fair Housing Alliance, explicitly mentioned reliance on the sales comparison approach as one of the issues the administration is not addressing.

3   See "About PAVE," Interagency Task Force on Property Appraisal and Valuation Equity, accessed January 26, 2023, https://pave.hud.gov/about#directive.

4   "Uniform Appraisal Dataset Aggregate Statistics," Federal Housing Finance Agency, last updated December 15, 2022, https://www.fhfa.gov/DataTools/Pages/UAD-Dashboards.aspx#Dashboards.

5   These agencies are the FHFA (overseeing Fannie Mae and Freddie Mac), the US Department of Housing and Urban Development (in particular, its Federal Housing Administration arm), and the VA.

6   "About," Appraisal Subcommittee, accessed January 18, 2023, https://www.asc.gov/about.

7   Statistical Produces Branch, "FHFA Uniform Appraisal Dataset Aggregate Statistics: A New Resource to Provide Insights on Home Valuation," *FHFA Insights* (blog), Federal Housing Finance Agency, October 24, 2022, https://www.fhfa.gov/Media/Blog/Pages/FHFA-Uniform-Appraisal-Dataset-Aggregate-Statistics.aspx.

8   The potential mechanism is that these buyers are more likely to be overstretched, as the real home valuation is lower, and thus the real loan-to-value ratio is higher than it appears. Other traditional factors of predicting default, such as ability to repay and credit score, are still likely far more predictive.

9   See also Eriksen et al. (2020), LaCour-Little and Malpezzi (2003), and Agarwal, Ben-David, and Yao (2015).

10   As Freddie Mac notes, "Low confidence [of Freddie Mac's AVM] is commonly the result of a lack of good data or recent sales data in the area. An appraiser will have the same difficulty obtaining good information in rural areas." See "Home Value Explorer (HVE) FAQ," Freddie Mac Single-Family, accessed January 18, 2023, https://sf.freddiemac.com/faqs/home-value-explorer-faq.

11   "Uniform Appraisal Dataset Aggregate Statistics," Federal Housing Finance Agency.

12   One example that appeared in the *New York Times* (see Debra Kamin, "Home Appraised with a Black Owner: $472,000. With a White Owner: $750,000," *New York Times*, last updated August 25, 2022, https://www.nytimes.com/2022/08/18/realestate/housing-discrimination-maryland.html) was a particularly notable case because one of the homeowners is a history professor at Johns Hopkins University and an "expert on redlining and the legacy of white supremacy in American cities, and much of his research focuses on the role of race in the housing market."

[13] Chandra Broadnax and James Wylie, "Reducing Valuation Bias by Addressing Appraiser and Property Valuation Commentary," *FHFA Insights* (blog), Federal Housing Finance Agency, December 14, 2021, https://www.fhfa.gov/Media/Blog/Pages/Reducing-Valuation-Bias-by-Addressing-Appraiser-and-Property-Valuation-Commentary.aspx.

[14] Edward J. Pinto and Tobias Peter, "Special Briefing on the Impact of Race and Socioeconomic Status on the Valuation of Homes by Neighborhood," American Enterprise Institute, March 18, 2021, https://www.aei.org/economics/special-briefing-on-race-and-socioeconomic-status-on-the-valuation-of-homes-by-neighborhood/.

[15] See Pinto and Peter (2021), Rothwell and Perry (2021), and Pinto and Peter (2022).

[16] Brookings reports that "appraisal bias appears to explain less than 20% of overall devaluation, and most appraisals in majority-Black neighborhoods are above the contract price" (Rothwell and Perry 2022).

[17] See, for example, Yang et al. (2023).

[18] Narragon et al. (2022) shows smaller bias magnitudes after controlling for other characteristics and using a more sophisticated regression framework.

[19] Jonathan Liles, "Exploring Appraisal Bias Using UAD Aggregate Statistics," *FHFA Insights* (blog), Federal Housing Finance Agency, November 2, 2022, https://www.fhfa.gov/Media/Blog/Pages/Exploring-Appraisal-Bias-Using-UAD-Aggregate-Statistics.aspx.

[20] For updated analysis, see Michael Neal, Linna Zhu, Judah Axelrod, and Caitlin Young, "What Role Can Property Condition Data in Artificial Intelligence Modeling Play in Understanding AVM Error?" *Urban Wire* (blog), Urban Institute, June 15, 2022, https://www.urban.org/urban-wire/what-role-can-property-condition-data-and-artificial-intelligence-modeling-play? See also Bonnie Sinnock, "Two Reports Present Very Different Pictures of Appraisal Bias," National Mortgage News, June 21, 2022, https://www.nationalmortgagenews.com/news/two-reports-present-very-different-pictures-of-appraisal-bias; and Agrawal and Fox (2022) for another study finding no AVM bias, on average (from a company analyzing its own AVM and finding no racial bias).

[21] See Kyle Campbell, "Property Comparisons Are at Heart of Appraisal Bias, Advocacy Groups Claim," *American Banker*, November 11, 2022, https://www.americanbanker.com/news/comp-selection-is-at-the-heart-of-appraisal-bias-advocacy-groups-claim: "[The report] showed that the appraisers who dealt with Black homeowners were more likely than appraisers who dealt with white homeowners to choose homes in Blacker neighborhoods as comparatives and that played a role in the Black homes being valued less."

[22] Brad Finkelstein, "Black Knight's New Offering Examines Appraisal Comps for Bias," National Mortgage News, April 25, 2022, https://www.nationalmortgagenews.com/news/black-knights-new-offering-examines-appraisal-comps-for-bias. See also "About," True Footage, accessed January 19, 2023, https://www.truefootage.tech/about.

[23] See CFPB (2022a).

[24] See, for example, Shubham Panchal, "Human-in-the-Loop Systems—All You Need to Know," *Toward Data Science* (blog), Medium, April 8, 2022, https://towardsdatascience.com/human-in-the-loop-systems-all-you-need-to-know-c260920b8acf; and Ge Wang, "Humans in the Loop: The Design of Interactive AI Systems," Stanford University Human-Centered Artificial Intelligence, October 20, 2019, https://hai.stanford.edu/news/humans-loop-design-interactive-ai-systems. See also a *Wall Street Journal* op-ed discussing translators: "Five years after the introduction of DeepL, most human translators no longer actually translate, but neither have they been entirely replaced by machines. Instead, they use the technology to make translations easier and faster. The software generates a base translation, then the human translator 'post-edits,' fixing errors and making the text sound natural. But the feedback the translator provides also becomes part of the recursive loop in the AI's continual self-improvement." See Christopher Reid, "Will AI Make Creative Workers Redundant?" *Wall Street Journal*, January 9, 2023, https://www.wsj.com/articles/will-ai-make-creative-workers-redundant-machine-

learning-artificial-intelligence-technology-human-art-
11673303015?st=agatnajcd27ixih&reflink=share_mobilewebshare.

25 Cade Metz, "The Long Road to Driverless Trucks," *New York Times*, last updated October 14, 2022,
    https://www.nytimes.com/2022/09/28/business/driverless-trucks-highways.html.

26 "Autopilot and Full Self-Driving Capability," Tesla, accessed January 19, 2023,
    https://www.tesla.com/support/autopilot. For information on various investigations highlighting the dangers of
    overreliance on technology and possibly deceptive marketing, see Hyunjoo Jin, "Factbox: Tesla's Autopilot Faces
    Unprecedented Scrutiny," Reuters, November 1, 2022, https://www.reuters.com/business/autos-
    transportation/teslas-autopilot-faces-unprecedented-scrutiny-2022-11-01/.

27 Taking multiple photos inside a home would also raise privacy concerns. Mortgage transactions, of course,
    already have other privacy concerns (e.g., income and checking account information, often including transaction-
    level data), and thus credit risk holders and lenders storing sensitive data, as well as their regulators, are already
    sensitive to these issues.

28 Financial Institutions Reform, Recovery, and Enforcement Act of 1989, Pub. L. No. 101-73, 103 Stat. 183 (1989).

29 "Savings and Loan Crisis," Federal Reserve History, last updated November 22, 2013,
    https://www.federalreservehistory.org/essays/savings-and-loan-crisis.

30 Thomas J. Lueck, "Raising the Standards for Real Estate Appraisers," *New York Times*, October 21, 1990,
    https://www.nytimes.com/1990/10/21/realestate/raising-the-standards-for-appraisers.html. Notably, Mr.
    Bunton, who provided the quote for the 1990 article while an executive vice president at the Appraisal
    Foundation, now leads that organization.

31 Concentration of credit risk allows for easier implementation of our proposal, but it also presents more issues
    even in this context. For example, given that the major risk holders are all under government control, AVM
    selection might take longer and might involve trade-offs such as less conservative AVMs effectively allowing
    higher loan-to-value ratios. The competition space between these four risk holders is also nuanced, where
    Fannie Mae and Freddie Mac might be pressured to accept each other's models, while the FHA and the VA likely
    will not get enough funding to develop their own models and would end up accepting Fannie Mae's and Freddie
    Mac's models as well, potentially lowering competition across AVM providers.

32 Attention of regulators and appraisers' ability to override an AVM could be crucial. For example, around the
    height of the financial crisis, it appears that AVM accuracy degraded (Neal et al. 2020, figure 3).

33 See, for example, George Kromrei, "FHFA to Make Desktop Appraisals Permanent," HousingWire, October 18,
    2021, https://www.housingwire.com/articles/fhfa-to-make-desktop-appraisals-permanent/.

34 In hindsight, we believe that another solution could have been to use AVMs even more during the pandemic,
    with the appraisers driving by the properties for exterior examination and analyzing photographs or video call
    walk-throughs by customers.

35 See Collateral Underwriter by Fannie Mae (2021).

36 Patrice Alexander Ficklin, Amy Frisk, Arthur Lindo, Sameena Shina Majeed, Donna Murphy, Mark Pearce,
    Timothy Segerson, and James Wylie, letter to Michelle Czekalski Bradley, chair of the Appraisal Standards
    Board, February 4, 2022, https://files.consumerfinance.gov/f/documents/cfpb_appraisal-discrimination_federal-
    interagency_comment_letter_2022-02.pdf.

37 "Uniform Appraisal Dataset Aggregate Statistics," Federal Housing Finance Agency.

38 For example, as suggested by OIG (2022).

39 Julia Gordon, "Borrower Request for Review of Appraisal Results," draft mortgagee letter to all FHA-approved mortgagees and others, 2022, https://www.hud.gov/sites/dfiles/SFH/documents/borrower_req_review_appraisal_results_draft.pdf.

40 "Appraiser Diversity Initiative," Appraisal Institute, accessed January 19, 2023, https://www.appraisalinstitute.org/the-appraisal-profession/appraiser-diversity-initiative/?sf173899102=1.

41 Kyle Campbell, "Chopra: Let's Revisit 'Byzantine' Regulatory Regime for Home Appraisals," *American Banker*, January 24, 2023, https://www.americanbanker.com/news/chopra-its-time-to-revisit-byzantine-regulatory-regime-for-home-appraisals.

42 White House, "Fact Sheet: Biden-Harris Administration Releases Action Plan to Address Racial and Ethnic Bias in Home Valuations," press release, March 23, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/23/fact-sheet-biden-harris-administration-releases-action-plan-to-address-racial-and-ethnic-bias-in-home-valuations/. See also Michael Neal and Peter J. Mattingly, "Increasing Diversity in the Appraisal Profession Combined with Short-Term Solutions Can Help Address Valuation Bias for Homeowners of Color," *Urban Wire* (blog), Urban Institute, July 1, 2021, https://www.urban.org/urban-wire/increasing-diversity-appraisal-profession-combined-short-term-solutions-can-help-address-valuation-bias-homeowners-color. Also, the *New York Times* notes the following: "The home appraisal industry is overwhelmingly white, male and aging: the Bureau of Labor Statistics says that of the 75,000 appraisers in the United States, 97 percent are white, and other surveys show that nearly three-quarters are both male and above the age of 45." See Debra Kamin, "How Three Black Women Hope to Change the Home Appraisal Industry," *New York Times*, last updated January 18, 2023, https://www.nytimes.com/2023/01/10/realestate/black-women-home-appraisal-industry.html.

43 Andrew Martinez, "Senators Call for More Data Backing Appraisal Bias Proposals," National Mortgage News, March 24, 2022, https://www.nationalmortgagenews.com/news/senators-call-for-more-data-backing-appraisal-bias-proposals.

44 "How Many Appraisals per Week and How Much Time to Complete an Appraisal Report?" Appraisal Today, accessed January 19, 2023, https://appraisaltoday.com/2015/10/07/how-many-appraisals-per-week-and-how-much-time-to-complete-an-appraisal-report/.

45 McKissock, "How Much Time Do Appraisers Spend in the Office vs. the Car?" McKissock Learning blog, August 26, 2022, https://www.mckissock.com/blog/appraisal/how-much-time-do-appraisers-spend-in-the-office-vs-the-car/. Another account reports even more striking numbers: "Seasoned appraisers reported that they spend about 2 to 3 hours on each report. Less experienced appraisers noted they spend about 4 hours of paperwork per report" (see Shauna Hatch, "Why Are Appraisers So Happy with Their Jobs?" DataMaster, April 15, 2021, https://www.datamasterusa.com/in-the-weeds/why-are-appraisers-so-happy-with-their-jobs).

46 See 12 C.F.R §1026.42 (2015), Valuation independence. For state-level requirements, see Appraisal Institute (n.d.).

47 See, for example, 12 C.F.R §1026.42 (2015), Valuation independence, official interpretation of paragraph 42(b)(1), example 2.ii: "[examples of persons not covered:] person secondarily liable for a covered transaction, such as a guarantor."

48 See the Appraisal Standards Board's advisory opinion (at "Advisory Opinion 18 [AO-18], Working RE, accessed January 19, 2023, https://www.workingre.com/advisory-opinion-18-ao-18/), particularly example 4(b).

49 See, for example, Danny Gardner, "Automated Collateral Evaluation (ACE) Eligibility," bulletin to Freddie Mac sellers, March 16, 2022, https://my.sf.freddiemac.com/updates/guide/bulletin~2022-6; and Fannie Mae (2022). Although there is a notion that appraisal waivers might cause prepayment, recent FHFA research shows that this might not be the case, and the issues are correlational (Bosshardt, Doerner, and Xu 2022).

[50] A different solution that would likely be harder to implement is to do away with these discontinuities, as there is nothing magical about the 80 percent LTV ratio cutoff (or 90, 95, or 96.5 percent).

[51] There is also a deeper question about the different weights that appraisals should place on the various tasks they are meant to accomplish. One of these tasks is preventing self-dealing and fraud, in which case it should be clear to the appraiser whether the market value accurately reflects the home's value or whether the value is dramatically lower. Another task is consumer protection, ensuring that consumers who are not as experienced in homebuying do not make an uninformed choice, where the price might not be as dramatically off value as in cases of self-dealing. See Appraisals for Higher-Priced Mortgage Loans, 78 Fed. Reg. 10368 (Feb. 13, 2013).

[52] Even with refinance appraisals, there are several potential targets for appraisers, such as whether the refinance would allow the borrower to forgo mortgage insurance.

[53] Currently, the major risk holders are effectively the taxpayers, aside from the credit risk transfer programs at Fannie Mae and Freddie Mac, and thus the typical concerns about the government holding risk apply.

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Laurie Goodman is an Institute fellow and founder of the Housing Finance Policy Center. The center provides policymakers with data-driven analyses of housing finance policy issues that they can depend on for relevance, accuracy, and independence. Before joining Urban, Goodman spent 30 years as an analyst and research department manager at several Wall Street firms. From 2008 to 2013, she was a senior managing director at Amherst Securities Group LP, a boutique broker-dealer specializing in securitized products, where her strategy effort became known for its analysis of housing policy issues. From 1993 to 2008, Goodman was head of global fixed income research and manager of US securitized products research at UBS and predecessor firms, which were ranked first by Institutional Investor for 11 straight years. Before that, she held research and portfolio management positions at several Wall Street firms. She began her career as a senior economist at the Federal Reserve Bank of New York. Goodman was inducted into the Fixed Income Analysts Hall of Fame in 2009. Goodman serves on the board of directors of MFA Financial, Arch Capital Group Ltd., and Home Point Capital Inc. and is a consultant to the Amherst Group. She has published more than 200 journal articles and has coauthored and coedited five books. Goodman has a BA in mathematics from the University of Pennsylvania and an AM and PhD in economics from Stanford University.

Michael Neal is a principal research associate in the Housing Finance Policy Center. Previously, he worked at Fannie Mae, where he was a director of economics in the Economic and Strategic Research division. Before his service at Fannie Mae, Neal was the assistant vice president at the National

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