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Response to:

FHFA Request For Information on Appraisal-Related Policies, Practices and Processes

# Introduction: Brief and Qualifications

The well-thought-out *Request For Information* is appreciated, and organizes responses usefully.

The detail and depth of the questions asked, preceded by the relevant background and history, makes it easy to respond from a basis of knowledge and objectivity.

Very briefly, I would like to set out my qualifications, my place in the sea of stakeholders, and basic concepts. I find the three areas of requested input to be interrelated and mutually consistent.

**Appraisal Policy and Process Improvements** are directly connected to **Risk Management** as the underlying need for reevaluation. **Industry Considerations** reflect the need to benefit and relate to the needs of major participants in collateral risk issues.

My comments are primarily from the perspective of the capacity of **modern process technology**. This RFI is a refreshing adventure into the challenge of human and organizational resistance to change.

Each stakeholder has different interests and motivations. It is possible that *only* the FHFA has the power and the motivation to effect real change to “help prevent the next economic meltdown.” This on behalf of our citizens, consumers, and providers of housing and housing services.

The entire context of this response is around the **cost-speed-reliability** tradeoff. We will also add a fourth dimension: *Additional* useful analytic services which can promote the mission of the FHFA, while promoting consumer protection and the overall public good.

My Qualifications:

* *Not* currently affiliated with any lender, AMC, AVM, or regulatory agency
* The following designations and memberships:
  + SRA and MAI – Appraisal Institute
  + ASA – American Society of Appraisers – ARM (Appraisal Review and Management)
  + CRE – Counselor of Real Estate
  + LAI – Lambda Alpha – (Land Economics International)
  + ASA – American Statistical Association
  + RMA – Risk Management Association
* Extensive graduate education in math, statistics, econometrics, risk, and computation
* Authorship of peer-reviewed articles on valuation, risk, and modern analytic methods
* Authorship, including a weekly blog focused on appraisal modernization (data science methods)
* Expert witness and consultant, including AVM, mass appraisal, and loan fraud cases
* Instructor, Appraiser qualifying, advanced, and continuing education courses
* Appraisal Foundation certified USPAP instructor
* Chair, *AVM Reporting Standards* committee, (Industry Advisory Council, Appraisal Foundation)
* Appraisal, review, management, and academic advancement

Professional assignments

* AVM consulting and development
* Appraisal/consulting: primarily residential, partial interest, mass valuation
* Author of numerous peer-reviewed and education/training courses and Education, research, and authorship of technology-enabled integrated valuation systems

# Appraisal Policy and Process Improvements



Modernizing the Enterprises’ appraisal requirements and process improvements requires a deeper look into embedded historical, **traditional practices**, as well as the multi-layered nature of **regulation**, **business models** and persistent legacy **appraiser education**.

Of critical relevance here is that an ‘**appraisal’** must be performed by an appraiser, licensed in one or more of the 54 states, territories, or the District of Columbia. A **valuation** may be provided by non-appraisers. **Non-traditional appraisals** generally allow exceptions from traditional practices.

An appraiser is subject to Uniform Standards of Professional Appraisal Practice (USPAP), which mandates the result to be an *opinion*. Specifically that opinion must be credible -- “worthy of belief.” **USPAP does not define *traditional* practice.**

In my opinion, any modernization effort will have to consider *all* valuation solutions, not just appraisals done by licensed appraisers. Buy-in from multiple major stakeholders is a necessary challenge.

The underlying valuation process is simple and universal:

* Identify the **subject**, the objective, and acceptable assumptions.
* Delineate the *relevant* **market** segment and predictives (elements of comparison).
* Apply predictive **algorithms** (make adjustments).
* Communicate **result** (“appraiser opinion”).

Modern (transparent) methods can deliver **additional critical information**, such as a reliability (risk) score, forecast values, fundamental value, auditability checkpoints, and real-time revaluation.

|  |  |
| --- | --- |
| Question A1.1: | Is there is a need to provide new valuation solutions that address industry identified issues of appraiser capacity, turn-times, training, and rural and high-volume market coverage? What are those potential solutions? What are the risks of these policies and the challenges in implementing them? |

**New analytic solutions are available that** improve appraiser capacity, turn-times, and coverage.

The **modern solution** systems optimize AVM speed/cost, and appraiser judgment. These systems are scalable and match turn-time to reliability level. They improve rural sparse-data situations by reliably extending the optimal information set, while adjusting cost/speed to high-volume settings.

The opportunity and the challenge relates to ‘big data.’ **Big data** is broadly defined. Briefly, it comprises complete, instantly available data, directly transformable into useful decision information. The answer to big data is **data science**.

The data science solution overcomes the ‘black box’ issues of AVMs, while clarifying the ‘grey matter’ human judgment and credibility. This solution is not complex. It is a matter of optimizing the interface between computer power and field-related experience.

However, the simplification is not easy. It involves new thinking to replace old thinking:

* **Forms thinking** (8½ x 14) is no longer necessary. *Screen dashboards* optimize screen space, customized to user needs – whether for data input, analysis, review/audit, management, or risk or portfolio management.
* **Inspection thinking** is replaced with *information-input thinking*. The needed level of data on the subject property, comparables, and neighborhood/market information adjusts to the collateral situation.
* **Results** can comprise more than a point-value market price. Several *additional market metrics* and property predictives are readily returned – for seamlessly connectable collateral risk models.

The benefits of data science are enabled by the dramatic change we have witnessed in data collection, data visualization, and computer analytics. Data science methods are an inevitable result.

Modernization cannot work in the constraints of the obsolete “appraisal process.” Modernization cannot work in the darkness of black box proprietary algorithms.

The questions are: How do we proceed? What are the potential solutions?

Data science, for valuation/risk analytics comprises:

* Complete data sets, rather than samples
* Competence of a field-related expert
* Computation algorithms and visuals

Solutions must address a wide variety of concerns, but they are founded in modern asset analytics, which includes computer interface and human capacity – and training in modern methods.

**I believe that the essence of the future of valuation rests simply on exploiting the best of computer algorithms and human judgment via visual interface.**

Any potential solutions must be clear on the nature of present reality: Technological, psychological, institutional, and legal/regulatory:

* We know about the technologies available.
* We know about the nature of bias, conscious or unconscious.
* We know the reality of institutional/organizational inertia on multiple levels.
* The FHFA is confronting some “inconvenient truths” – for implementing authentic solutions.

Dramatic change can only come from good authority, such as the FHFA, with governmental support. Risks are similar for any major change: resistance, obstruction, and pouting . . . and it will happen regardless of the solutions enforced. Regardless.

The challenge is thoughtful inclusiveness of research and input – such as this very RFI, this very open request for information, publicly shared and enabled.

Defining terms:

* **Reliability** is the other side of *risk*. Lower reliability entails higher risk.
* **Systems** refer to appraisals, AVMs, and other variations of the *valuation process*.
* **Big Data** is the challenge and opportunity of complete data, and storage, analytics.
* **Data Science** is the fusion of computation, complete data, *and* field-related knowledge.
* **Information** is data made useful. This is accomplished in three ways:
  + **Selection** of what matters and what does not matter;
  + **Measurement** and validation for evidence;
  + **Prediction** via consistent algorithms.

Conclusive summary

**Risks of improved processes** are trivial, compared with the clumsiness and difficulties of force-fitting new regulations onto current systems and standards. Integration and consistency are preferred.

There is *great need* for new valuation solutions. Potential solutions can exploit modern technology, without snuggling up to the false warmth of *obsolete* appraisal processes.

The comments here focus on the solutions available by applying the principles of the new *science of data* to the challenges and opportunities presented by data science for collateral risk decisioning.



Traditional appraisal (in this context) includes interior home inspection. Then “non-traditional” means differing inspection options. This is true whether valuation is done by appraisers, non-appraisers, or the workload is split, involving two or more humans. In any case, these levels of subject inspection always relate to the **cost-speed-reliability** tradeoffs.

Augmenting traditional appraisals with *reduced* data reflects in lower **cost**, faster **speed**, and higher **risk**. Splitting the traditional appraisal may induce tradeoffs of data quality for speed and other factors.

Reliability is always reduced where personal observation is limited. This is true whether via desktop or exterior-only data input. Recall that ‘traditional’ **appraisal field work** involves three elements:

* **subject** property, interior and four sides, and rear yard areas;
* **comparable** sales, visuals of exterior, street location, adjacent and proximate influences, and;
* **neighborhood** influences, including nearby land uses, and any out-of-area location differences.

Third party data collection is always subject to three levels of variation:

1. The **competency** of the person viewing the subject, comparables, and neighborhood influences.
2. The level of **communication** between the field observer and the desk data entry person.
3. Doubled **bias potential** could occur for either the field observer and data entry person.

Each pair of field evaluator–data entry individuals would have different relationship characteristics (e.g., race, age, status, or nationality) which could in some cases be *a new source of bias*.

***Summary: Risks, challenges and benefits***

**Risk** is higher, due to reduced data quality, and [possibly] increased bias.

**Benefits** could include a pathway for entry for vocational appraisers.

**Challenges** include a new layer of training, regulation, and interface mechanisms. It would also require a new training pathway to become a “field inspector.” (Would this require the 54 states, territories, and the DC to develop new training approval requirements and entry fees?)

***Opportunities to improve traditional appraisals***

Traditional appraisal is based on **opinion**, formed from *picking comps and making adjustments*. These two mental processes tend to be subjective, and subject to multiple types of bias (analytic and human).

Modern data science provides us with simple means to make more objective data selection, focus on the relevant market segment, and enable simple modern predictive methods.

Modern data science methods can incrementally improve current practices and results, as well as advance toward additional results useful for collateral, regulatory, and risk management functions.

Conclusive summary

Non-traditional services all seem to come at the cost of reliability and possibly incur administrative complexity. Data science methods can incrementally improve traditional methods, and more.



Waivers are allowed “when the Enterprises determine they have enough information on the current value.” The issue here is, as always, what is the tradeoff of speed, cost, and risk?

Again, the decision is a ‘granular package’ rather than a continuum of weighted risk relevance. Caps or other limits on waivers also would similarly be a granular decision, ‘all or other’ in nature.

**Granularity** leads to more complexities in regulation and administration, and perhaps more vulnerable to gaming or edging for ‘make-the-deal’ advantage.

“Each Enterprise approaches the waiver decision differently.”

Current risks comprise the above. The underlying problem is the **lack of a consistent, continuous, measure of risk** related to various systems of valuation process decision.

The [applied data science] methods we suggest here enable a smooth continuum of valuation process, focused on the risk/reliability level desired. The issue of “waiver” disappears when the system incrementally accounts for the risk up front. Then the decision is a function of risk, rather than the other way around.

Conclusive summary

The waiver issue can disappear with a consistent risk-oriented *continuum* of valuation alternatives. When *risk level* is the driver, the decision pathway becomes clear and apparent.



Inspection workforces such as insurance adjusters, real estate agents, appraisal trainees, or others, again gives up reliability in return for possible speed or cost savings.

If the real underlying concern is **appraiser capacity** – then we must look at the history of real estate transaction volume (sales or refinances). The history shows a persistent up and down pattern, with periods of little need for agent/appraiser/services sectors, and periods of high need. The cyclical patterns will likely persist. Lowering reliability to fill temporary needs simply aggravates the problem of oversupply when the cycle goes the other way.

Then the least qualified people leave or are dropped, and the burden goes to other governmental transfer payments, including unemployment or even welfare.

When the cycle repeats itself, again, new untrained people are expected to enter the system. This may perpetuate the problem of a nearly continuous cycle of poorly qualified property inspectors and appraisers.

The solution must come from the process itself. A process which flexibly adapts itself to changing conditions.

Benefits of using third-party non-appraisers generally assume that data collection does just that: collect data. Yet the real issue is not *data* collection. It is *information* gathering. Recall that data becomes useful information by selection and improvement.

* + **Selection** of what matters and what does not matter;
  + **Measurement** and validation for evidence;
  + **Prediction** via consistent algorithms.

Field work (subject inspection, comparable viewing, neighborhood depiction), involves two of the three ways to convert data to useful information: **selection and measurement**.

In traditional appraisal, the good appraiser leaves the office with information about the **subject** with and about perhaps six or seven potential report **comparables**. The appraiser will also have prior familiarity with the **neighborhood** and the different competing market groups that likely exist within that physical neighborhood.

The ‘field’ appraiser actively engages in data selection, measurement, and updating neighborhood change. Each of these explicitly involves interactive analysis.

1. The **subject** improvements information is gathered and verified. This includes important interior features such as size, functional utility, condition, effective age, and safety elements. Subject site features include adjacent negative (and positive) elements, effective site area, and view (often not/poorly quantified in public records or MLS listings)
2. **Comparable** elements are identical to those above for the subject. Except that the information will be less reliable. Fortunately, comparable measure mistakes tend to “average out,” having less effect on calculated results. (An exception to this might be where fraud perpetrators, along with a compliant appraiser -- ‘create’ a couple of overpriced sales, to create false sales prices. Quickly, you have an inflated market price called “market value.”)
3. **Neighborhood** familiarization and evaluation serves several purposes:
   * Identifying the key predictor variables, (“elements of comparison”)
   * Noting any recent changes in neighborhood influences
   * Viewing and quantifying proximate influences

Each of the above activities are *interactive* and require appraiser decision-making experience. Alternately, non-appraisers can be trained to apply judgment in each dimension above.

Data collectors can only be trained to collect data. To transform the data into useful information requires training and experience. That information is then transformed into risk/reliability scoring.

When valuation reliability goes down, risk goes up. The use of *non-appraisers* creates a reduction of reliability. This alternative is granular, with additional risk variation within the choice depending on the training, regulation, and selection of field-data-collectors cum field-information-creators.

Risks of using third-party non-appraisers are apparent:

1. They will generally be *less qualified* and *less motivated* to identify real and/or **large impacts**;
2. They will generally be less motivated to real issues, as enthusiasm for quality may disappear.

Finally, the use of non-appraisers may create more empire building and regulatory bureaucracy. (Will we now need 55 state and territorial sets of rules on appraisers, AMCs, and inspectors?)

Conclusive summary

Third-party workforces for “data collection” will be problematic. Field work for an appraiser is interactive and requires trained judgment. Data is just data. It only becomes useful information after intelligent sorting (like eliminating non-competitive sales), or identifying relevant elements of comparison (predictor variables, like view or traffic noise). This sorting and identification takes place in four places: the subject interior; the subject exterior and rear yard; comparable location and visible features; and neighborhood changes and influences (particularly where data must come from other neighborhoods).



Yes. However, I believe that *additional* policies and controls may become part of the problem. *Replacement, and even elimination* of the multiplicity of regulatory burdens is necessary, particularly relative to **appraiser education**.

There are places where free-market forces work exceedingly well. Other places they simply put an additional burden on the consumer and taxpayer, and kill innovation. In some cases, motivation veers from service and clean profit motive, to smartness in *gaming* the system.

The appraisal profession is unusually overburdened with regulation:

* I believe that current licensing ensures limited, subjective, gaming and fudging at many levels.
* Current educational requirements suffer at several major levels.
  + Innovation is stymied due to static, regurgitative nature of required legacy education.
  + Innovation is anchored down by **extremely** **high administrative costs of education delivery**.
  + Low demand for new education is ensured by little demand for a superior, risk-based product.
* Appraisal methodology is anchored in the past.
  + Legacy methods are entrenched in appraisal **standards**: a mix of procedures, principles, and admonitions to be credible (believable), and unbiased.
  + Industry/regulatory expectations destroy motivation for innovation.
  + **Standards require appraisers to meet user/client expectations**.
  + **Standards require appraisers to match other appraisers’ actions**.
  + Repeated admonitions are to be credible -- “worthy of belief.”

The *new* policies and controls are absolutely needed. These must not only balance risks and efficiency, but should exploit modern data science methods and protocols to:

* Reduce **risk** at all levels.
* Provide **scalability** of valuation services.
* Promote **usefulness** of otherrisk/forecast information.
* Strengthen **efficiency** for lender, Enterprise, and regulatory roles.

Conclusive summary

Modernization is difficult if the change attempts to force fit it into outdated paradigms. Subjective data selection *precludes* objective results, and inhibits adjustment support.

Transparent, algorithmic data selection enables reproducible work product. Reproducibility enables genuine individual-valuation risk scoring. Risk scoring enables enhanced risk management.

*We must move from* ***comparing comps*** *to* ***measuring markets****.*

Modern (Data Science) methods dramatically mitigate the subjectivity and bias which comes from ‘**picking comps**.’ (Where *complete* market data is readily available.) They mitigate the subjectivity and bias which comes from ‘**making adjustments**.**’** (Which requires a return to the very market data originally discarded in picking comps.) In fact, we have found that with sufficient data, traditional ‘adjustments’ often become unnecessary, as the market position of the subject becomes obvious and self-explanatory.

Why has this not happened already? Appraiser education has continued as it has – teaching principles developed in the 1930’s, designed for sparse, difficult-to-collect data.

About **130 forms and $7000** in state/territory/DC/ fees are required for *one* approval of *one* course. In addition, there is an approval fee of $1800 to the Appraisal Foundation, for a 14 hour class. A wide and varied set of required documents ranges from fingerprints, notary fees, insurance, and class fees.

**Additional fees** are demanded by states to enable on-line delivery during the current pandemic.



The UAD and forms redesign objectives are clear:

* Align with the new MISMO;
* Assess whether new data or data revisions are needed;
* Include all property types, and provide similarity to other loan forms.

Benefits should streamline reviews and speed the overall process. Changes will be required in other business processes and forms and data elements.

Current and future needs should coincide. However, current systems should encourage rather than restrain evolving technology. Current and evolving technology optimizes the machine-brain interaction. While the computer is adept at calculations and logic, the human brain is adept at seeing patterns, outlier recognition, and generalizing. The ideal long-term solution involves exploiting this partnership.

The move to update the dataset is appropriate. However, I see a conflict.

On one hand, it is possible to compile a lengthy list of data fields and their possible values and sequences. On the other hand, valuation prediction and precision is usually optimized with just five or six data elements. So what is the issue?

A lengthy list of data fields can create a difficult level of interaction. In econometric analyses, it is called “the curse of multidimensionality.” As more and more data elements are added and defined and redefined, the relationships and decision trees and options and search paths themselves become unwieldy. While I hope I am wrong, I fear the deep and wide categories and subcategories and relationships and dynamic forking form decisions may become cumbersome or even unmanageable. Training how to use them would have to be fairly detailed. Judgment will be required.

**UAD update**

Having deeper levels of data fields *aligns with “quant” thinking*: “**Just get me the data, and I can figure it out**.” Thus the loud call for more and more detailed data. Unfortunately, modern methods place most of the emphasis on data wrangling to turn it into useful information. The reality is that, in most markets, only a handful of variables (elements of comparison) really matter. The rest get washed out in the remaining variation that comes from different personal preferences against a small group of competing buyers.

What matters is *not* *necessarily* a long list of variables detailed in a tree-structure of dynamic questions. What does matter is the *weight* that each choice and each decision carries. Data does not solve problems. Modeling judgments determine when data converts to useful information.

The modern field of Data Science states: “80% of the analyst’s time should be spent on data, and the rest on analysis”. Our experience in the *Community of Asset Analysts©* is that orderly delineation of the relevant data frames is the key. From the initial download, parametrization and identification of *all* competing sales, then relevant analytic frames . . . the process dramatically reduces the uncertain need for ‘adjustment procedures,’ and clarifies the process of the analyst’s judgment decisions and algorithmic models. Again, the focus is on **measuring markets instead of comparing comps**.

Data science comprises three components:

* Complete data
* Cognition models
* Computative algorithms

Data collection must match expert cognition, and algorithmic modeling decisions. A thorough, updated, UAD is necessary and important. It is equal in importance to cognition and interactive algorithmic selection.

**Forms redesign**

Current ‘forms’ redesign seems to be proceeding in a modernization direction. In particular, the removal of the 8 ½ x 14 paper form thinking will prove highly beneficial in the future. It will allow movement toward future (perhaps incremental) development toward integrated data, code, visuals, and minimized narrative explanations.

The current redesign provides **opportunities for refinements and additions**.

I suspect however, that the ‘form’ itself will grow even more rigid, attempting to account for all unique possibilities with a tree solution structure. In reality, the detail may be counterproductive.

Most unresolved ‘data’ uncertainty is not the detail such as countertop material or color. What matters are major predictor variables which are inherently ordinal, (or outlier-like) in nature, but influence value greatly, such as view, usable site area, or functional utility.

Reliable results involve a trade-off.

The trade-off is between untrained-but-detailed data collection, and the interactive brain processes recognized in modern data science principles. The ideal balance provides the best results. Opinion-based appraisal, alone present subjective or biased results. Contrarily, structured algorithmic models, lacking interactive judgment also present subjective or biased results.

The ideal ‘form’ must optimize the *brain-machine team*. Computers calculate and carry out algorithms. Humans observe, generalize, and identify anomalies. **Simplification** will approach these now-available generalized methods. **Data science for valuation** is straightforward, given today’s complete data and computer power. It is certainly simpler than the 705 pages (plus online electronic addenda) of the most recent 15th edition “The Appraisal of Real Estate” of the Appraisal Institute.

Conclusive summary

In my opinion, the UAD update is on the right track. Data science practices (currently and in the future) enables superior results to what we have with today’s *grey-matter* appraisal, *black-box* AVMs, and the fuzzy in-between hybrid/desktop/evaluation alternatives. The optimized methods can provide a *glass box*, reproducible, auditable valuation product, including standardized certainty scoring.

The traditional **appraisal** model is obsolete, applying reverse logic by selecting comps first, then doing market analysis. 30 years ago, that method worked well. Today, modern valuation enables much more.

We need to measure markets, not compare comps. We need analytic results with *measurable* sureness, not opinion believability. We need a transparent, replicable work product, not “trust me” grey matter or black box algorithms. The valuation process must start with objective similarity analytics, to result in objective results.

Data science methods for valuation, and Evidence Based Valuation, are being taught to current appraisers in two, two-day courses, and can be comfortably integrated into traditional practices and forms. (**Transition** to evidence-based methods is incremental. At the same time, these methods lead to transparent, replicable, auditable valuation/risk data-stream reports.)

Data dictionaries, data creation, and field-active appraiser judgment best go hand in hand. The Enterprises and other government-related valuation activities do not need to require this blended ideal in every case. However, the public trust, the consumer, and lenders deserve this *option of optimality*.

# Risk Management



My responses on risk management are based primarily on my knowledge of the potential for *risk scoring* from individual valuations and appraisals (when built on data science principles and protocols).

Risk is the obverse of *reliability*. Reliability of valuation results depend on the following:

* **Appropriateness**: answers the question asked
* **Information**: selection from data available
* **Predictor**: selection of market sector
* **Model**: suitability of algorithm
* **User**: dashboard uptake



When I became a residential appraiser, we had the CMDC, a California offshoot of the national SREA data source. It was a compilation of property data on all sales and refinances. It was entirely appraiser data. It was good.

Between the MLS and CMDC (California Market Data Cooperative) and public records (on microfische!), all on my desk, data was reliable and easy to get (in spite of the fact that it was paper and ‘old.’) It was kinda like what appraisers want from the Enterprises today)! Confirming phone calls were a fourth form of improving and verifying information when there was any question.

Lenders cooperatively supported appraiser data, and appraisers provided more reliable results. Nice.

We had the data. Later, CMDC was bought out by a ‘for profit’ company (as I recall). Legal issues even caused MLS agents to stop measuring houses, always deferring to the ‘usually’ correct public records.

Data is converted to useful information by only three means: 1) classification, and 2) association, 3)sequencing. Classification enables contrasting. Association enables simple regression. Association enables ordinal (non-parametric) methods.

Data is data. It is not information until it is transformed or otherwise wrangled into usefulness.

If the Enterprises have transformed or mutated data, those fields are probably not necessary to share with appraisers. The analyst/appraiser is responsible for filtering or arranging data to suit a particular assignment. Anything done by another appraiser or by internal Enterprise analyses, probably should not be shared with appraisers anyway.

Data comprises factual or reliable measurements. To withhold perfectly good data seems contrary to the Enterprises’ safety. Good data is good -- for any analyst, whether appraiser or AVM.

Compiled information, such as “average” of other-appraiser ratings or comparisons for consistency of the same appraiser from one assignment to another is not data. It is information specifically designed as an administrative review (not an appraisal review). While it can be used to confront inconsistencies by appraisers, it is not original or factual data. It is information for another intended use.

If an appraiser judges a quality or condition or other rating differently than a prior appraisal or one done by someone else, the appraiser is asked to explain why his judgment is different from others’ judgments. This delays and changes motive. The appraiser game now becomes to try to *match what others’ ratings probably are*, rather than a personal judgment of what *is*. At some point, gaming the system takes over, and overtakes the purpose of unbiased valuation. It becomes more important to ‘get through the system’ than to aim for good results.

I am not sure how data generated by appraisers would ‘crowd out’ other (conflicting?) data. The public good and safety of the Enterprises is best served by good data, not by protecting equality between bad, better, and best.

Conclusive summary

The only challenge I see in releasing data to appraisers is that factual data would have to be separated from opinion or mutated data, and internal *appraiser* scoring, or otherwise subject to privacy issues.



Large bank lenders may prefer their own tools. Smaller lenders might benefit from third-party collateral analyst tools. Currently available collateral tools could be improved by seamless integration of valuation/risk products into their systems. (Strangely, a single-point-value output provides little ‘meat’ for model risk structures, *whether provided by an AVM or as human opinion.*)

Such valuation/risk product output can be reduced to less than 8 or 10 variables as input to lender systems. The moderate interface dimensionality simplifies interconnection, and enables flexibility.

To understand the *collateral tools* *for lenders* issue – it is important to distinguish two types of *thinking* influence. “**Data quants**” tend to be people with degrees in computer programming, software engineering, or just plain statistics. **Data scientists** tend to have a broader training, but that training emphasizes the need for field-related expertise, along with computation and visual interface.

Interactive visual interface is the key to optimizing the brain/machine solution. (Current effort on dynamic appraisal ‘forms’ is definitely headed in the right direction here.)

*Data quant orientation*

Currently available tools (in my opinion) seem to be dominated by that quantitative computer-science ‘data quant’ thinking. “Just get me the data, and my algorithms will figure it out.” This works great – until it doesn’t.

*Data scientist orientation*

The philosophy of data science is that algorithms work best with interactive human expert participation. This is true at all levels: *data > information > reliability > prediction > decision*. This data science thinking is the ‘modern’ philosophy. Resulting models **adapt interactively with changing conditions**, and can integrate macro-economic and catastrophic events into the formula.

Such emphasis on automated algorithms tends to neglect the importance of modeling judgment. Balance is best. The overemphasis on *data* detail neglects the importance of interactive *modeling* detail.

In particular, modeling at the analyst/appraiser level enables superior results. Human participation, properly motivated, helps avoid the major catastrophic ‘black-swan’ events brought on by fixed algorithmic solutions. Unexpected shifts in economic, political, and even public health events happen.

Conclusive summary

Collateral tools available to lenders, especially such as *smaller* banks and credit unions, can integrate human input. The smaller institutions may very well have better micro-decision-making skills than the large lenders. Flexibility to adapt to scale of operations seems appropriate, and can even be used to advantage:

1. To fine tune the relationship between **risk versus immediate profit**;
2. To improve perspective between **catastrophic events**, and typical credit losses;
3. To enable **continuing improvement** of relevant property data and changing conditions.

Embedded algorithmic automation allows the possibility of disastrous failure. Highly competent computer programming, with creation of detailed algorithms can fail and have failed in the past. The greatest losses on the public come from *systemic* problems, not from typical individual ongoing defaults.

There is no doubt that we need to utilize computer power and data. And for long-term safety; for ongoing flexibility and adaptability to changing conditions – collateral tools must integrate human flexibility and adaptability to those changing conditions.

**Catastrophic losses cause the greater damage** to the consumer, the Enterprises, and the public good. Avoidance of attention to risk at the macro level can only be effectively addressed by the FHFA, and other overarching public agencies.





Challenges include service, enforcement, and consumer protections. However, there is also the impact of lower data and information quality and accuracy.

Much of an appraiser’s field work requires “on the fly” judgment.

Yes, some of this involves the **subject property**. And importantly, it involves visual judgment regarding comparables, adjacent, proximate, and neighborhood influences. Often these influences can be substantial. In the *Stats, Graphs, and Data Science1* class, we use an example of a property which has detrimental proximate issues. Nearby model-match sales are easily available. The impact on value, evidenced by a sale price was some 40% lower!

Non-appraiser entities lack appraiser knowledge, experience and market familiarity nor support systems. What does this mean to Enterprise risk, potential bias, and consumer/taxpayer interests?

Field work by an appraiser involves *interactive* decision-making at three levels:

* **Subject** property features.
* **Neighborhood** nuances
* **Comparable** features

Appraisal standards require geographic competence because location effects are best experienced *interactively*. The reason **comparables** are inspected is to see adjacent and proximate influences, as well as compare visible elements. Subject elements affect value directly. It is difficult, if not impossible to create a ‘checklist’ or software tree of possible negatives and positives, as useful as that might be for an inexperienced data collector. The dynamic data entry decision tree is helpful, but cannot substitute for the human superiority of observation, generalization, and outlier detection and research redirection.

Data collectors would require a query software package which runs wide and deep into the myriad of things which impact value. Most of these will be trivial. But in other cases, such as with functional obsolescence, crack under the carpeting or back of a closet (possibly indicating a cracked slab), a ‘green’ leaking pool, property line encroachment, or even roof leak – attention and aware judgment is required

Data *collection* is different from *expert inspection*.

Enforcement of yet another role, another layer onto the current system, could be a problem. It also presents another potential exposure point for bias. (Presumably data collectors either would not have an enforceable set of ethical or standards to follow, or another system of licensing would need to be imposed, perhaps paralleling ‘appraiser trainee’ trainee and licensing currently in place.)

Similarly, consumers would have lesser protection, as many data collectors would have less investment in this as a career. (As well as lower qualifications to perform data collection inspections.)

Historical perspectives of the attitude of professionalism seem to have diminished as the result of minimal-duty’ licensing and enforcement, and the USPAP “twin directives” to **comply with lender expectations**, and to always **mirror peers’ actions**.

Conclusive summary

A clear divide between a data collector versus the appraiser “information generator” will be necessary.

New regulatory structures will likely be necessary for training, licensing, regulation, as well as ‘data collection’ standards for “data collectors.”



For the long run, valuation flexibilities will be necessary. Real property transactions have historically been cyclical. They will continue to do this. Any system needs to provide for the pressures which inevitably come from recurring cycles.

However, the flexibility should: (1) recognize and measure the impacts on risk, both short and long run, and (2) adjust flexibilities to a conscious understanding of the impact on risk.

As we reconsider the speed/cost/risk tradeoff, it is probably good to explicitly recognize that there will be some impact of these types of events on speed, and perhaps on cost. A risk-based system should ideally be a continuum of valuation process options, rather than the coarse choices tried so far. The continuum should directly be a function of risk measure.

Finally, it is necessary to know that any market impact – whether natural, economic, or political – will affect and increase risk. The question is how much, and how long will the impact last. In essence, reduced turnaround speed may be a good thing, if for no other reason than to regather and gain information about the depth and forecast persistence of the event.

Conclusive summary

A dynamic, data science oriented systems presents the ability for quick response and flexibility in the event of changing conditions, events, and structures.

# Industry Considerations





**Appraisal modernization, per the RFI**: “For purposes of this Request for Input (RFI), appraisal modernization means exploring the respective *risks and benefits* of the **entire range** of property valuation alternatives.” (Emphasis added.)

1. **Hybrid** appraisals
   * The “appraiser trainee, home inspector, or real estate agent” reports to the lender.
   * The lender sends to the Enterprise’s automated underwriting system (AUS).
   * If necessary, an appraiser is engaged, and the collected data is provided for a desktop.
2. **Desktop**
   * The appraiser provides a point opinion.
   * No subject inspection, no interactive comparable selection/viewing, no neighborhood visuals are required.
3. **Exterior** only (comps?)
   * Interior information comes from others, possibly *prior* appraiser inspections.
   * Options to consider: Are *comparable* selection/viewing, and *neighborhood* *familiarization* an option?
4. **COVID-19** “event” flexibilities
   * COVID is one case of ‘event’ situations, which include natural disasters and economic crashes.
   * These have been well below 10% of appraisals, and comprise only low collateral-risk situations.
   * Each crisis event is different and multidimensional.
   * The crisis or event itself creates both reliability risk, *and* data risk.
5. **UAD** update
   * Uniform data fields enables better data sharing, if that is a goal of the Enterprises and FHFA.
   * Data dictionaries help standardize, but can not anticipate every evolving situation.
   * The role of data needs to be kept mentally separate from the role of data analysis.
6. **Forms** redesign
   * Evolution here should anticipate custom dashboards by user type.
7. **AVMs**
   * AVM is an industry, not a model.
   * Proprietary black box models inhibit cooperative efforts.
   * Measures of reliability/risk are also proprietary, and subject to bias.
8. **Gap products** -- between appraisal waivers and traditional appraisals
   * Solution is a risk-gradient, integrated *continuum* of analytics, rather than granular competing methods.

Traditional appraisal is mired in legacy 1940s education and beliefs, as well as *believability* standards. These *outdated practices are perpetuated* as ‘approved/required’ practices, including USPAP, which mandates appraiser scope of work: “type and extent of research and analysis” to 1) meet **user expectations**, and; 2) do what appraiser peers would do. Thus the **obsolete “appraisal” system is embedded in administrative law**, inculcating bias.

‘Appraiser’ valuations should modernize: from comparing comparables to measuring markets. These results enable reliability/risk scoring and significantly improved accuracy. This is accomplished in the context of transparency, reproducibility, and auditability (to displace subjective believability standards).

Alternative appraisals seem to have had little positive effect on the quality of traditional practices.

**Valuation systems comparison**



*A more detailed expanded chart is available*, for the multiple alternative systems.

Conclusive summary

It appears modern data science systems provide the best future alternatives.

* Enabled results are far superior to other alternatives.
* Transition is straightforward, but will require education.
* Current pending changes are helpful, and enable progress.



I have some hands-on experience here. The *Stats, Graphs, and Data Science* classes have been attended by well over 2000 appraisers. These classes emphasize EBV (Evidence Based Valuation)©­. Attendance comprises all types of appraisers. The leading-edge nature of the curriculum tends to attract younger appraisers. However, a number of late-career professionals have found rejuvenation in the methods. One such person began using the complete-data, open-source methods we suggest. Shortly after, he stated: “*These methods have made appraisal fun again*.”

I believe that late-career appraisers generally prefer doing things the way they have always done them. No doubt a few would prefer doing nothing but desk work, but most originally chose this career due to the variety of activities and challenges the work offers.

Some will of course cease operations. Many are ready to do so anyway.

Younger appraisers seem to be drawn by the personal technology, which extends to an intuitive understanding of the value of data and the role of human interface.

Four years ago, one young man (a PhD in computer science, who works for a large credit rating company) was helping me in our *first* class devoted to ‘*R*’ (the open-source analytics software). We sat down at a coffee shop prior to the class. He asked me to give him a quick overview of the appraisal process. I started out with the words: “Well first, the appraiser picks some comps.” He interrupted me. “What do you mean, pick comps?” I responded with an explanation that the appraiser peruses the list, with pictures, and selects *six or eight* sales that seem similar. Then picks *three or five* to put into the report. Then makes adjustments and draws an opinion.

His face turned white. He looked at me under his forehead. Incredulously. I think he said: “Really”?

After a few deep breaths, I was able to reassure him that we do *not* teach that four or five comps is the ideal. We teach that the ideal data set can vary in size. And that identifying the ideal complete data set is a critical part of the EBV. And the analysis proceeds from there.

*You cannot get objective results from a subjective data selection.*

The younger people are drawn to modern methods. Methods that are not mired in tradition. Methods that utilize computer power, visual interface, and personal competent interaction.

Conclusive summary

Modern methods attract younger professionals. They will be drawn to the concept of “Asset Analyst.” They take naturally to complete-data assumptions and methods, visualization, and instant results. Interim methods and transitionary education will appeal to some older appraisers, others will choose to sell only traditional methods.

A slowing in real estate activity is coming. It will reduce demand for appraisers. Licensing ‘standards’ will again cycle. Up and down.



I do *not* believe that granular, pre-ordained changes, as proposed in this RFI, would have a positive impact. More complexity and potential for bias could occur.

My extensive research, writing, and teaching modern methods leads me to believe that the best solution is an integrated solution. Multi-furcation complexifies decision-making, beyond the layers of administration, management, and alternative motivations. Complexity enables bias and even manipulation, whether minor, moderate, or bringing on of yet another economic crisis.

Conclusive summary

The additional services and measures, as presented in the “Valuations Systems Comparison” table will be of great benefit to the Enterprises, to our regulatory structure, and the public.



I have not independently researched for possible discrimination in current collateral valuation practices. I have heard of some anecdotal evidence, where the bias is individualized. If individualized bias is possible, then racial discrimination of credit availability may happen, and be systemic. I do believe that predatory lending does exist. Such predatory lending seems to be associated with poorer neighborhoods with lower-value real property prices. (However, I do not personally know of any current evidence-based study to support this. I have not researched the issue.)

Discrimination (or control) in neighborhood prices work both ways. Those (the ‘haves’) who already have homes benefit when prices rise. Those who do not own homes (the ‘have-nots’) will have even greater affordability obstructions to home-ownership.

*Any* discrimination (identified or not) can be at least partially ameliorated with a consistent risk-based valuation gradation functioned on risk. An elevator, not shaky, irregular steps.

Alternative and automated solutions could have a discriminatory impact, in my opinion, under added human influence, or by hidden algorithmic assumptions or processes.

**Alternative methods**, (such as hybrids) due to their complexity offer more inroads for possible bias. In any case, the complexity and needed increased micro-regulation could increase loan costs in the very areas where the relief from possible bias is desired. Unintended consequences then tend to demand more rules and regulation.

**Automated methods** present a different potential for bias. These models tend to be complex internally. Bias can be hidden deep inside layered algorithms. They can arrive inadvertently, particularly with the common use of surrogate variables for estimations and decisioning. Automated methods tend to be ‘black box,’ with no real way to identify *process* *bias*. *Results* *bias* requires wider, and reactive study after the fact. After the damage has been done.

Conclusive summary

Bias and discrimination in housing has no place in our form of government. In the pursuit of equal opportunity and simple fairness, we must be particularly aware where argument can go astray. This is particularly true in the ‘polarization’ we seem to be experiencing today.

To have productive and *real* examination and solution, I find three science/logic arguments to be destructive, and even create greater polarization.

1. **Anecdotal information**, one case provides little strength to a position. Three cases (like three comps) provide better argument. However, the argument is still subject to personal bias from selection or from the randomness that may occur in such a small sample.
2. **Association of two events**, where they occur at the same time, does not require that one causes the other. For example: Drownings are highly correlated with ice cream sales. Is it possible that eating ice cream causes water problems. Or --- that drownings cause friends to eat more ice cream? Probably not. Perhaps it is just that it is summer . . . *Correlation is not causation*.
3. Intended results can be swamped by **unintended consequences**. In Jeremy Bagott’s recent book *Dispatches from the Cosmic Cobra Breeding Farm* the example of government assertive action to rid parts of India of dangerous cobras -- ended up creating a far greater problem. Mr. Bagott’s book touches on many issues important to **potential regulatory changes around appraisal**. (Particularly the requirement to pay for and learn privately generated law).



Current **appraisal** practices enable subjective judgment in the selection of data, “picking comps.” This inherently enables bias of several types:

* intentional and unintentional;
* conscious and unconscious;
* analytical or personal.

As noted below, some human judgment, at some level, attends every valuation whether fully automated or fully opinionated.

The objective is to minimize human judgment at points where personal bias may enter. Human judgment will enter regardless. The solution is to assign human expert judgment to points which are well-defined, parameterized, and displayed visually. I have found that where judgment points are well defined and clearly displayed, human agreement is surprisingly high – surprisingly similar in conclusion.

Current **AVM models** are proprietary and secret by design. Bias may be hidden deep within the algorithms. There are several ways this hidden bias can happen. One way is when a surrogate (stand-in) variable is used for another variable not directly measurable. The surrogate variable itself does not affect bias. But it happens to be correlated with a variable which *is* correlated to some form of bias. It can be identification of race, color, creed, sexual preference, or anything of that nature.

**Data science** methods, principles, and protocols by their transparent nature tend to expose tendencies of any kind, discriminatory or not, intentional or not.

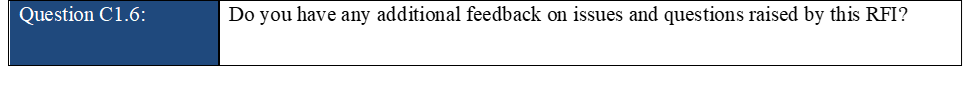
Conclusive summary

Fair housing is best served by efficient, unbiased measurement.

Additional results provided by data science analytics for housing, valuation, and risk measures enable future documentation for issues of bias, discrimination, affordability. Such documentation can in turn enable better public policy, in an ongoing basis.

The data science methods, or Evidence Based Valuation, are designed to be transparent and replicable. Visualization and simple summary statistics make the analysis understandable. Human input and modeling decisions are clearly set out. Any potential discriminatory bias sticks out.

# Summary and Overall Recommendations



Appraisal modernization must rely on **current technology**, and **current availability** of data science concepts and tools. The ongoing (open-source) development in the field is dramatic, so future improvements are assured.

Contrarily, to **force-fit** coarse granular changes onto traditional legacy practices would serve only to delay the best result possible. “The good is oft the enemy of the best.”

Each of the current and proposed alternative systems tend to be ‘biased’ toward their own use. AVM companies tend to favor AVM usage. Appraisers tend to favor traditional ‘well proven’ methods. AMCs (Appraisal Management Companies) tend to prefer their own methods for selecting and screening valuations. Lenders, depending on corporate size, tend to favor their own systems. And finally, the Enterprises, competing with each other, tend to favor their own internal systems and (perhaps hidden) risk appetites.

**The FHFA is in a position to unify *toward* a consistent, unbiased valuation system**. The first goal is to clarify the *ideal* system (or integrated set of systems) possible today. The second goal is to navigate a *path* toward that goal.

This ideal system recognizes the *universality* of the steps of the valuation process:

Science of data Legacy terminology

1. Delineate **problem** (scope of work)
2. Select **information** (pick comparables)
3. Identify **predictors** (elements of comparison)
4. Predictive **algorithms** (make adjustments)
5. Transmit **data stream** (deliver the report)

Whether the process is an AVM, appraisal, BPO, evaluation, or hybrid, all that matters is the quality and depth level of each step. Obstacles will include *habit*, *vested interest*, *organizational inertia*, and even personal *fear* of change. I believe each of these obstacles can be traversed, once overall FHFA direction is authorized.

At each step, the process involves three elements:

* The **algorithms** (approaches) applied;
* Human **expertise** and involvement;
* Machine/brain **connect** level.

Data science principles, practices, and protocols are organized around the above three elements.

**Reliability and risk assessment** is possible, given today’s data availability in most areas. Data science principles, if properly applied can significantly improve results. **Usefulness depends on reliability**, which depends on three components: ***appropriateness*** (scope); ***accuracy*** (trueness); ***precision*** (sureness).

**Appropriateness**: does the result answer the question asked?

* With **AVMs**, this is a decision by the lender. “This property can be analyzed by this algorithm.” When there is ‘no hit’ an alternative valuation method is assigned.
* With **appraisals**, the appraiser makes the decision, based on competency and ethics. Competency is of the property type, geography, and analytic method.
* With **other systems** also some human makes the decision that a particular method/algorithm is appropriate for the property and market. Even when ‘automated’ some human has programmed the parameters of acceptability in every case.

**Accuracy**: does the result give a correct answer, which is, or approaches the truth.

The truth here is unknowable, except that in the case of sales, a probabilistic comparison can be made.

* With **AVMs**, this may vary according to the particular vendor selected.

Bias can be hidden deep in the algorithm, if desired.

* With **appraisals**, this will vary according to the data selection and adjustments applied. Bias might be intentional or unintentional.
* With **other systems** some combination of the above are possible. Bias might come from either the ‘inspector,’ the desk appraiser, or both, for example.

**Precision**:

* With **AVMs**, currently each vendor provides their own measure of sureness, (often called “FSD” forecast standard deviation, or “CI” confidence interval). Third party testing companies can be used to compare different vendor products.
* With **appraisals**, no measure of variation is possible, as the data selection is subjective. “Opinion” estimates of reliability are *not* taught in appraiser education. Only the storyline narrative “reconciliation” of the three approaches is suggested.
* With other **systems**, estimation of sureness is even more obfuscated, due to mix of methods.

The traditional appraisal process requires the appraiser to first select comparables, *then* perform market analysis. This is **inverted logic**. This logic allows, even incites personal and analytic bias. In days past, this legacy logic worked. Today it is obsolete, and interferes with our goals.

**The FHFA is perhaps the only entity in a position to effectively modernize appraisal -- in an industry bogged down in outdated practices, heavy bureaucracy, and impossible ‘believability’ enforcement**.

Data Science **substantially eliminates bias** through objective data selection and machine learning tools.

Reports become more **concise, readable, and even auditable**, when reproducibility protocols and process is invoked. Auditability also removes *reviewer* bias and subjectivity.

Current appraisal standards require the appraiser to be credible “worthy of belief.” This *belief* standard is then theoretically tested (for violations!) by a reviewer, who is also commanded to be worthy of belief. The ***believability* test is subjective, archaic, and obsolete** -- in a big data, digital, computerized visualization world.

**Valuation data science** provides analytic *results*, and can be structured to provide a standardized reliability score. The reliability score can then be transformed to a *risk score* for collateral decisioning.

***Accessibility***:

My work in this area is ongoing. I apologize for the length of this analysis. It has been a passion for me over the years. For me a true opportunity to answer relevant and significant questions.

These questions, which if answered, can truly help us “**prevent the next economic meltdown**.”

I have been writing, and teaching ‘modernized valuation’ methods for several years. The interaction of teaching, writing, and prior academics in relevant fields (statistics, econometrics, computer science, and data science) – has given me a unique background of relevance to ‘modernized’ valuation methods.

My weekly blog, (at georgedell.com) since 2016, often deals with questions and answers to many of the issues posed by the FHFA here. My paid TAAR (The Asset Analyst Report)© also presents currently available statistical, econometric, and data science methods on a monthly basis.

My current ‘signature’ course *Stats, Graphs, and Data Science****1***has been taken by over 2000 appraisers. These are professionals those who genuinely want to improve service and apply modern methods. Seldom do we get students who are “there for the CE.” (There are much easier ways to get ‘hours’.)

**We have motivated people capable of filling the need**.

Data science methods apply data selection algorithms, which can be enhanced by human interaction. Data science methods apply predictive algorithms, easily learned for those with appraiser experience. Data science principles are available to anyone who wishes to work to modern methods.

My class design is called EBV (Evidence Based Valuation).© The copyright is to prevent commercial misuse, as well as to encourage wide public use.

Attached is “Appraisal Modernization” paper I wrote last year (2020).

It outlines and provides greater detail of the general methods recommended. In brief, it recaps a plan which can be used by FHFA toward the Enterprises future policies. It is not intended to replace the needed curriculum.

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Summary of the attached addendum white paper

In essence, human judgment is applied only at critical modeling points, while algorithms carry out logic and calculations. The main basis of human/machine interface is visualization.

The focus is on market measurement, (not comp comparison):

1. **Market** identification, documentation, and outlier handling;
2. **Similarity** algorithms and applications;
3. **Predictive** models selection;
4. **Data stream** delivery.