

October 31, 2022

Federal Housing Finance Agency
Office of Financial Technology
Constitution Center
400 7th Street, SW
Washington, DC 20219

Regarding: Technology in Housing Finance Request for Information

Submitted electronically: <https://www.fhfa.gov/AboutUs/Contact/Pages/Request-for-Information-Form.aspx>

Dear Deputy Director/Chief Fintech Officer Cave,

Thank you for the opportunity to respond to the *Fintech in Housing Finance Request for Information* ('RFI' or 'Fintech RFI') published on July 18, 2022. We applaud the creation of the Office of Financial Technology and the initial approach to seek information from interested parties.

As background, RiskSpan is a leading technology company offering the industry's most comprehensive platform for data management and analytics for residential mortgages and structured products. The cloud-native platform provides SaaS analytics for on-demand market risk, credit risk, pricing, and trading. Our data science experts and technologists make RiskSpan the leader in data as a service and end-to-end solutions for loan-level data management and analytics. Our clients cross the mortgage finance ecosystem and include investors, Government Agencies, mortgage banks and intermediaries.

The FHFA Fintech RFI aligns well with RiskSpan's mission to be the most trusted and comprehensive source of data and analytics for loans and structured finance investments. The FHFA Fintech RFI is an important development to our firm, and we are available and eager to discuss any portion of this response or participate as an observer or advisor on the forthcoming 'tech sprints.'

We were pleased that Director Thompson established the Office of Financial Technology with these guiding objectives:

- Support FHFA in developing strategies for the agency's regulated entities to advance housing finance fintech and innovation in a safe and sound, responsible, and equitable manner;

- Engage with market participants, industry, nonprofits, consumer groups, and academia to facilitate the sharing of best practices of housing finance fintech and innovation;
- Establish ongoing outreach through the regulated entities, promoting awareness and understanding of housing finance fintech and innovation;
- Facilitate interagency collaboration with other regulators to enable information sharing and partnership opportunities; and
- Serve as an Agency resource for innovations, general trends, and emerging risks in housing finance fintech.

These are important objectives to the industry and our firm. We support Director Thompson's approach to piloting and testing solutions so that best-in-breed fintech advances can proliferate and benefit the housing finance system and especially the equitable treatment of all borrowers. Accordingly, we stand ready to support the newly established Office of Financial Technology in the same manner and care with which we support FHFA today through tools such as our [Edge platform](#) through which we deliver quarterly UMBS reports. FHFA also uses Edge to run ad-hoc reports and queries on the Fannie/Freddie pool and loan level MBS data.

With respect to the RFI, we were pleased to note in your appearance at #HousingDC22 that respondents may address particular portions of the RFI where they have the greatest intellectual capacity.

Therefore, our letter focuses primarily on section B: Questions on Fintech Opportunities numbers B1-B5 and areas we find critically important in Blockchain, Computation Processing, Cloud-Native Computing and because of its gravity, we call attention to Climate Risk.

Questions on Fintech Opportunities

Interspersed throughout the questions are the central tenets of data, data integrity, source data, traceability, repetitive use and cost reduction and efficiency. These issues are important both to regulators—as they seek to create efficiencies and cost save opportunities, eliminate fraud and defend against algorithmic bias—and to secondary market risk managers as they seek to transform the 360-degree view of the consumer throughout the mortgage lifecycle through to the investor.

In the current environment, investors lack access to reliable loan and property data that drives pricing, risk and responsible ESG investment decisions. Multiple legacy vendors are required to support pricing, trading and risk management. And data is re-validated multiple times with high data latency and risk of error and exposure of personal identifiable information (PII).

Loan Level Data Ledger and Blockchain

Access to clean, normalized and verified loan data “cradle to grave” solves multiple operational pain points across the industry. A blockchain implementation of verified data would include all the underlying reference documentation, with borrower and property information updated in “now” time.

These blockchain efforts, ledger technologies, artificial intelligence and robotics are today transforming the 360-degree view of mortgage. They add strong downstream efficiencies to the mortgage markets affording counterparties better insights. Leveraging real-time data and integrated analytics, improved pricing and risk with granular loan and property data, enable a smoother process for servicing transfers and provide a single source of trusted data. This results in significant cost savings for market participants and consumers alike.

We observe moving to a single source of data truth streamlines everything. Today’s model for mortgage data exchange is based on an outdated notion of what is technologically feasible. The servicer’s database is still thought of as a stand-alone system-of-record. The investor’s database and downstream applications must rely on, reconcile, and make sense of loan-level ‘tapes’ generated by this system-of-record.

This model of a single system-of-record housed with the servicer could be transformed into a blockchain, with every detail of every mortgage and all subsequent transactions captured and distributed to investors. With this new model, investor reporting as it exists today would cease to exist.

Managing mortgage loans on a blockchain would instantly update investors with borrower activity, such as refinancing, prepayment, and rejected payments. These and other transactions would appear in a sequence that everyone could readily decipher.

Information asymmetry is consistently a problem for many in the private label securitization market, with many transactions having 10 or more parties contributing to verifying and validating data, documents, or cash flows. Blockchain can help overcome this asymmetry by, among other benefits, sharing loan-level data with investors, re-envisioning the due diligence process, and modernizing document custody. Allowing private blockchains to share information and document access with relevant parties is the key to making all this possible.

Today’s cumbersome due-diligence process reflects a lack of trust in the PLS market. Increased transparency, using blockchain technology, could help to restore some trust and make the process run with less resistance. Automation can streamline the due-diligence process, removing the current need for 100% file reviews and adding this to a secure blockchain only available to select parties. If reconciliations are deemed necessary for an individual loan file, the results could be automated and added to this blockchain.

Private (or ‘permissioned’) blockchains are designed for a specific business purpose, so achieving consensus requires data posted to the blockchain to be verified in an automated way by all parties relevant to the transaction.

Much of blockchain’s appeal is bound up in the promise of an environment in which deal participants can gain reasonable assurance that their counterparts are disclosing information that is both accurate and comprehensive. Visibility is an important component of this, but ultimately, achieving consensus that what is being done is what ought to be done will be necessary in order to fully eliminate redundant functions in business processes and overcome information asymmetry in the private markets while leveraging computational processing.

Loan-Level Computational Processing

Most mortgage analytics today are performed by rolling loans with similar characteristics into groups (called “rep lines”) and running analyses on these groups as if they were a single mortgage. Every borrower is unique, however, and mortgage investors benefit from the ability to look at and evaluate loan characteristics individually. The results may need to be rolled up and grouped for reporting purposes. But being able to run the cash flows at the loan level ultimately makes the aggregated results vastly more meaningful and reliable.

A loan-level framework also affords mortgage investors the ability to be sure they are capturing the most important loan characteristics and are staying on top of how the composition of the portfolio evolves with each day’s payoffs.

ESG factors are an important consideration for a growing number of investors. Only a loan-level approach makes it possible for these investors to conduct the kind of property- and borrower-level analyses to know whether they are working toward meeting their ESG goals. It also makes it easier to spot areas of geographic concentration risk, which simplifies climate risk management to some degree.

To effectively manage loan-level pricing and risk analytics, the process starts with the data. Most investors have access to loan-level data. But it’s not always clean.

This is especially true of origination data. Investors acquiring a mortgage pool – be it a seasoned pool or a pool right after origination – don’t have the best origination data to drive their model. They also need a data store that can generate loan-loan level output to drive those analytics and models.

Loan-level analysis also depends on having models that work at the loan level – models that have been calibrated using loan-level performance and that are capable of generating loan-level output. One of the constraints of several existing modeling frameworks developed by

vendors is they were created to run at a rep line level and don't necessarily work very well for loan-level projections.

Finally, loan-level analytics require a sophisticated compute farm. It is virtually impossible to run loan-level analytics outside of the cloud because of the need to distribute the computational load. These computational distribution requirements vary from portfolio to portfolio based on the type of analytics, scenarios and models being used.

The cloud is needed not just for CPU power but also for storage. Loan-level require every loan's data to be made available to every processor performing the calculation. This is where having the kind of shared databases, which are native to a cloud infrastructure, becomes vital. It cannot be replicated using an on-premise setup of computers.

Cloud-Native Computing

The trend toward cloud computing continues its march across an ever-expanding set of mortgage services.

The inherent flexibility, efficiency and scalability afforded by cloud-native systems driving this trend are clearly of value to users of financial services data. Mortgages in particular, each accompanied by a dizzying array of static and dynamic data about borrower incomes, employment, assets, property valuations, payment histories, and detailed loan terms, stand to reap the benefits of cloud-native analytics.

Migrating to the cloud evokes some of the shiniest words in the world of computing – cost reduction, security, reliability, agility – and that undoubtedly creates a stir. Cloud's ability to provide on-demand access to servers, storage locations, databases, software and applications via the internet, along with the promise to 'only pay for what you use' further contributes to its popularity.

These benefits are especially well suited to mortgage data. They include:

- On-demand self-service and the ability to provision resources without human interference – of particular use for mortgage portfolios that are constantly changing in both size and composition.
- Broad network access, diverse platforms having access to multiple resources available over the network – valuable when origination, secondary marketing, structuring, servicing, and modeling tools are seeking to simultaneously access the same evolving datasets for different purposes.
- Multi-tenancy and resource pooling, allowing resource sharing while maintaining privacy and security.

- Rapid elasticity and scalability, quick acquiring and disposing of resources and allowing quick but measured scaling based on demand.

Cloud-native systems reduce ownership and operational expenses, increase speed and agility, facilitate innovation, improve client experience, and even enhance security controls. There is nothing quite like mortgage portfolios when it comes to massive quantities of financial data, often PII-laden, with high security requirements. The responsibility for protecting borrower privacy is the most frequently cited reason for financial institution reluctance when it comes to cloud adoption.

Yet perhaps counterintuitively, migrating on-premises applications to the cloud actually results in a more controlled environment as it provides for backup and access protocols that are not as easily implemented with on-premise solutions.

The cloud affords a sophisticated and more efficient way of securing mortgage data. In addition to eliminating costs associated with running and maintaining data centers, the cloud enables easy and fast access to data and applications anywhere and at any time.

The cloud protects mortgage data from security breaches or disaster events because the loan files are (by definition) backed up in a secure, remote location and easily restored without having to invest in expensive data retrieval methods.

Climate Risk Fintech

We would be remiss to not raise the topic of climate in our response. When industry gathers and discusses the risk climate poses to housing, they typically do so in qualitative and relative terms. A Florida home is at greater risk of hurricane damage than an Iowa home. Wildfires generally threaten homes in northern California more than they threaten homes in New Hampshire. And because of climate change, the risk these and other perils pose to any individual geographical area are largely viewed as higher than they were 25 years ago.

Most feel comfortable speaking in these general terms. But qualitative estimates are of little practical use to mortgage investors seeking to fine-tune their pricing, prepayment, and default models. These analytical frameworks require not just reliable data but the means to translate them into actionable risk metrics.

Broadly speaking, climate risk manifests itself as a combination of physical risks and transition risks. Physical risks include “acute” disaster events, such as hurricanes, tornadoes, wildfires, and floods. Chronic risks, such as sea level rise, extreme temperatures, and drought, are experienced over a longer period. Transition risks relate to costs resulting from regulations promulgated to combat climate change and from the need to invest in new technologies designed either to combat climate change directly or mitigate its effects.

Some of the ways in which these risks impact mortgage assets are self-evident. Acute events that damage or destroy homes have an obvious effect on the performance of the underlying mortgages. Other mechanisms are more latent but no less real. Increasing costs of homeownership, caused by required investment in climate-change-mitigating technologies, can be a source of financial stress for some borrowers and affect mortgage performance.

Likewise, as flood and other hazard insurance premiums adjust to better reflect the reality of certain geographies' increasing exposure to natural disaster risk, demand for real estate in these areas could decrease, increasing the pressure on existing homeowners who may not have much cushion in their LTVs to begin with.

At the individual loan level, these risks translate to higher delinquency risks, probability of default, loss given default, spreads, and advance expenses. At the portfolio level, the impact is felt in asset valuation, concentration risk (what percentage of homes in the portfolio are located in high-risk areas), VaR, and catastrophic tail risk.

VaR can be computed using natural hazard risk models designed to forecast the probability of individual perils for a given geography and using that probability to compute the worst property loss (total physical loss and loss net of insurance proceeds) that can be expected during the portfolio's expected life at the 99 percent (or 95 percent) confidence level.

Investors seeking to build whole-loan portfolios that are resilient to climate risk should consider climate risk in the context of other risk factors. Such a "property-level climate risk" approach takes into account factors such as:

- Whether the property is insured against the peril in question
- The estimate expected risk (and tail risk) of property damage by the peril in question
- Loan-to-value ratio

The most prudent course of action includes a screening mechanism that includes pricing and concentration limits tied to LTV ratios. Investors may choose to invest in areas of high climate risk but only in loans with low LTV ratios. Bids should be adjusted to account for climate risk, but the amount of the adjustment can be a function of the LTV.

When assessing the impact of climate risk on a mortgage portfolio, investors need to consider and seek to quantify not just how natural hazard events will affect home values but also how they will affect borrower behavior, specifically in terms of prepayments, delinquencies, and defaults.

We are already beginning to see climate factors working their way into the secondary mortgage markets via pricing adjustments and concentration screening. It is only a matter of time before

these considerations move further up into the origination process and begin to manifest themselves in pricing and underwriting policy (as flood insurance requirements already have today).

Investors looking for a place to start can begin by incorporating a climate risk score into their existing credit box/pricing grid, as illustrated above. This will help provide at least a modicum of comfort to investors that they are being compensated for these hidden risks and (at least as important) will ensure that portfolios do not become overly concentrated in at-risk areas.

Conclusion and Next Steps

On behalf of the industry, we thank FHFA for creating the Office of Financial Technology. We stand ready to support the Office and believe opportunities exist with source data, blockchain, computational processing, cloud-native computing and climate risk tools for our firm respectively, but fintechs broadly.

We would welcome the opportunity to discuss how we could participate and assist the Office of Financial Technology in 'tech sprints' and other areas where the domain knowledge and expertise of RiskSpan may be applied.

Sincerely,

Bernadette Kogler
Co-Founder & CEO
RiskSpan