## QUESTIONS

1. **Fintech and Innovation**
   1. *How do primary and secondary mortgage market participants define fintech in the housing finance sector? What key factors should be considered?*

These market participants would define fintech around automation tools to get their required data points on a near real-time basis with the delivery of data versus paper. Primary would include originations and would actively work with the consumer to obtain the data points. Whereas secondary participants would receive the same data points accompanying either all loan sales or “at sale” data feeds as the loans are sold.

Ultimately, the key factors to consider in designing fintech solutions are the processes associated with automating and digitally enhancing the delivery, fulfillment, delivery, consumption, and portability of services associated with the financial sector.  Within the last 5-8 years, much focus on housing fintech has sought to address “application-to-approval” processes.  These include “point of sale” systems that simplify the collection of consumer data (application) and seek to provide approval to fund for easy-to-approve borrowers. For example, FICO scores, low to no negative credit attributes, simple wage earner income, and easy-to-quantify property value.  Private equity funding was key to the success of these platforms during this period.

* 1. *How could FHFA facilitate the adoption of “responsible innovation”?*

FHFA can facilitate the adaptation of responsible innovation by first defining standard formats of required data sets, allowing the free market to innovate and build accordingly. Setting required procedures places the onus on the Seller/Servicer to thoroughly vet their vendors and maintain safety/security procedures versus selecting specific vendors to provide what the Agency. Establishing standard formats and safety security procedures for the many to explore will create an even playing field in the marketplace versus eliminating market competition by selecting specific entities to be part of fintech ideation.

Secondly, to further facilitate adaptation, sponsoring research and information such as:

* Income versus Credit Score – Do income earnings have a measurable difference between earnings and earning potential and payment of debts?
* Promote 100% employment and income sources to include instant, consumer-driven, and manual workflows by technology providers
* Use open-source technology and standards that allow seller/servicers to select their own development or the technology provider of their choice versus being designated to one or two single providers.

Additionally, a clearly outlined set of expectations for what “responsible innovation” means in the marketplace including 1) ensuring the integrity and source of the data, 2) understanding the impact of innovation, and 3) responsibly protecting consumers, enterprises, and businesses. Pertaining to the second point, the impact must consider whether the innovation is a “replacement”, a “bridge”, or an “enhancement” innovation.  A “replacement” would be a full replacement fintech solution from its current incumbent system.  A “bridge” would manage fallout from a “replacement” fintech process.  An “enhancement” improves an existing technology/process.

“Bridge” and “enhancement” innovations often need assistance from enterprises to encourage marketplace adoption.  “Replacement” innovations are often associated with considerable “lift” in creating a positive impact for the customer or consumer, often supported by considerable investment capital.  Bridge and enhancement categories need enterprise assistance via pilot support (with the sponsoring vendor and customers) that encourages meaningful engagement with the vendor community as mortgage fintech matures.

* 1. *What factors currently inhibit the adoption of fintech and innovation in the primary and secondary housing finance sector? Are there specific challenges related to privacy laws, industry standards, or current practices?*

Today’s marketplace of originators and secondary market are full of proprietary platforms that are in use to originate, sell, and service the life cycle of the residential mortgage market. For example, Day 1 Certainty® limited access to their services with limited vendors with a large price tag for development and onboarding. As well, creating another whole set of security requirements that vendors already had vetted through Seller/Servicers. This severely limited free market access to services. Different standards by data sets and guidelines are challenging regarding compliance and operational practices. The industry needs to clearly set the standards as they relate to the market sector that is targeted and publish current practices across a broad sector of product specific to primary and secondary market. Clearly define what is a requirement and what is guideline. Do not eliminate effective fraud prevention steps simply because the loan passes a data test. It needs to pass all tests; eyes, making sense, risk factors, etc.

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

To date, there is a need for technology that can be quickly deployed and customized to meet ever-changing products and programs for the industry. For example, QM and non-QM are very different programs, but there are no seamless technology solutions an originator (or a secondary market player) can deploy and switch between the various requirements of the two. There is also a lack of open market opportunity with the large LOS/POS providers as well as the inability to quickly change service providers due to a lack of published standards acceptable by the industry (for example, the credit card industry certification PCI Security Standards Council).

A use case within the Secondary Market, for example, is the requirement for credit and verification status alerts to the market participants for a book being sold. The file could contain good/fair/poor ratings for credit and income, employment, assets, or collateral verifications.

* 1. *What are the typical time requirements of each process within the mortgage lifecycle? What are the “critical path” activities that drive the mortgage timeline and borrower expense? How could fintech be applied to improve efficiency, reduce costs, reduce time requirements, or facilitate equitable outcomes for borrowers?*

Typical turn times of each process within the mortgage lifecycle for manual and digital completion are as follows:

1. **Borrower Application Process:** *1-5 business days* dependent upon the technology of the organization. Not all entities use a Point of Sale (POS) technology -- some still use a face-to-face or online meeting with the Consumer and the Loan Officer. This step includes the loan application (URLA), document gathering or upload (i.e., paystubs, tax returns, bank statements, W2s, purchase agreement, lender worksheet for title, fees, etc.)
2. **Originator/Lender Onboarding Process:** *60 minutes digital* vs *up to 24 hours manual* to review and disseminate the application and documentation information through their loan origination system and execute the consumer disclosure requirements for TILA and Respa.
3. **Ordering Services & Communicating with Consumers:** Ordering title, inspection, and appraisal services would *take minutes* if there is a web-based ordering process in or out of their LOS. Otherwise, they default to manual ordering processes (i.e., fax and calls, etc.)
4. **Underwriting/Approving the Loan**:Today, it takes 24 - 72 hours estimated time to underwrite a loan*.* Desktop Underwriter and Loan Prospector are two systems by the Agencies that have automated the underwriting process. However, the system decisions are only as good as the data it receives, currently from manual input data instead of source driven, which adds to the overall turnaround time of closing a loan. For example, a manual process by the underwriter/ processor confirming the paper-based documents to the input data of the AUS. Most underwriting decisions are conditional and can add more time to the full approval (i.e., updated documents, responses from appraisers, letters of explanation).
5. **Locking the Loan**
6. **Doc Drawing:** *24 hours* based on pipeline.
7. **Closing and Funding:** *24 - 96 hours* dependent on transaction type; purchase or refinance. Getting the documents to the title agent. Once again delivery and receipt are very different across the nation from digital delivery to Fed Ex of the loan package.
8. Escrow vs Non-Escrow state – funds go with the docs or docs are review prior to releasing funds also extends the time frame.
9. Post-Closing & Delivery: 1 to 10 days dependent upon trailing documents, locks, etc.
10. Post-Closing Quality Assurance: 60-day post-close reporting of findings

The mortgage lifecycle and timeframes continue to expand and shrink dependent upon volumes. Even while advancing technology, it is critical to remember that most originators are working from an origination system that they either build, purchase, or buy a license to use. The systems are typically outdated legacy styles and experience lag times to deploy newer technology for onboarding, underwriting, and closing mortgage loans. The technology is expensive, and new enhancements typically lead to more expense. Based on many recent industry reports, residential loan origination costs are up around $10K -- and increasing per quarter. Additionally, the amount of time to close a loan can average around 30-45 days, according to regular reporting.

Valuation and title are the largest individual line-item expenses per mortgage. Sales costs to procure the loan are the largest expense, ranging between 51% (large banks) to 62% (large independent mortgage bankers) of the total costs to originate the loan. Alternatively, fulfillment costs (processing, underwriting closing) have little variation between originator types, ranging between 21-23% cost per loan. Lastly, technology accounts for 5-9% between originators, with large banks at 9% and 5% for mid-sized banks and credit unions. The investment capital that infiltrated mortgage in 2016 and onward was well positioned, targeting the sales costs per loan.

As the second largest cost center, processing – namely for qualifying income figures -- can certainly benefit from FHFA-sponsored pilot and research opportunities. As costs to validate income rise and access to instant, validated data are a premium cost resource, opportunities to create relational models for borrower income is an important step forward as we seek to create tolerances for income ranges specific to borrower risk profiles.

Technology is increasing the cost to originate a loan. It is not able to be deployed 100% of the time across the entire nation, primarily due to the makeup of internal and external players associated with the loan origination through the loan closing process.

This embodies a variety of outside services required to conclude the approval process including appraisers, title companies, realtors, inspectors, and attorneys. Each one of these entities uses different technologies that do not “speak” to standard origination technology or, in worst-case scenarios, use no technology at all.

Bringing technology tools and development funding to underserved markets in mid-size counties and rural areas to digitize their document and data collection would benefit consumers in those areas and the origination chain accordingly. The need for open-source development and clearly enumerated standards regarding data, compliance, security, and portability is critical in fostering a level playing field in fintech innovations within the loan origination marketplace.

* 1. *What are the typical drivers of repetitive requests to borrowers or reevaluation of underwriting information by the lender in the mortgage process, and what opportunities exist to automate processes?*

GSE requirements such as revalidate employment 5 days prior to closing or final credit report request if credit monitoring is not used. Provide other addresses the borrower may have provided on a tax return to correct a 4506-C tax transcript request.

Other drivers stem from paper-based processes and lack of direct source information. As well, the calculations needed to determine the borrower eligibility is updated several times during the loan origination process. Regular requests to borrower from updating documents for borrower employment, income, and assets to explaining inquiries on a credit report or signing forms also require reevaluation by the underwriter. Using source data and adding calculations would eliminate the regular back and forth.

* 1. *What are the existing data challenges that most prevent data-driven decision-making in the mortgage lifecycle?*

Agency guidelines are one of the greatest challenges that prevent data-driven decision making in the mortgage life cycle. Without Agency approval, technology providers are restricted to participate. For those who are at the table, they may not be incentivized to continue product innovation. The Agencies need to set process and data standards and guidelines instead of hand-picking the fintech providers to meet the need. The free market will deliver a much better mouse trap than a market monopoly. For example, a tax form evaluation component renders a multiple tab excel file that needs to be reviewed by a human-- this leaves room for human error in the review of all the data.

At NCS, we parse the data directly from tax transcripts render the calculations and business rules around the tax data to provide a 12- and 24-month income. As well, we provide data from the Schedule C, E & F in the same fashion. But we cannot get this product adopted because it is not approved by FNMA/ FHLMC despite our approved status with Day 1 Certainty as a tax transcript provider. Incumbent processes to meet FNMA/ FHLMC requirements specific to income calculations are an existing challenge. The originator is on their own to ensure their calculations meet Agency guidelines. Why not automate your tool for self-employed borrowers right in DU?

In other words, if the Agencies clearly set the standards, the technology will come. Then, originators can determine which technology meets their needs the best.

* 1. *What are the existing regulatory and policy barriers to adopting and implementing fintech within the mortgage lifecycle.*

A lack of standard security certification entity or certification. The amount of time developers spend responding to individual entities security assessments can equate to 30 days or more every year. Even with a SOC 2, Type II.

As a use case, NCS developed a qualifying income determination tool called Income+. This tool leverages source VOE and tax transcript data to drive a rules engine. The qualifying income is displayed as a single number, with messaging and alerts accompanying the result. Lastly, all source data is appended to the report thus permitting the underwriter to evaluate the findings and provide reasoning for a different number if needed.

1. **Equitable Access**
   1. What new fintech tools and techniques are emerging that could further equitable access to mortgage credit and sustainable homeownership? Which offer the most promise? What risks do the new technologies present?

2022 has provided a snapshot of more origination tasks moving outside the LOS to a POS. It is unknown whether this is due to the industry wanting to move the process closer to the consumer contact or to improve user experience with the consumer in obtaining key pieces of information versus recontacting them. Or possibly, the LOS provider does not provide the underlying data as well as a POS? This is more of a continuing trend that we started seeing in 2021. As well, it remains surprising that a majority of originators still opt to manually originate versus using a POS.

* 1. What emerging techniques are available to facilitate or evaluate fintech compliance with fair lending laws? What documentation, archiving, and explainability requirements are needed to monitor compliance and to facilitate understanding of algorithmic decision-making?

Technology tools do not have any bias other than the programming associated with the task, or decision, the tool is providing. There are the 3 C’s: Capacity, Credit, and Collateral. Today, the only human component to those 3 areas is the Underwriter and the Appraiser. The Underwriter decisioning is currently fulfilled by DU/LP as the AUS technology. Credit reporting data, with the qualifying income and assets input to them, should render decision data points to determine whether they qualify or not. The Appraisal Report can still be impacted but more tools are being released today that will facilitate less human input and more market data. However, this will not serve rural communities or those areas that do not capture property records or transaction details digitally.

* 1. Are there effective ways to identify and reduce the risk of discrimination, whether during development, validation, revision, and/or use fintech models or algorithms? Please provide examples if available.

As stated above, removing humans from the decision, and using market data only, will effectively result in eliminating biased decision-making regarding race or location.

1. **Fintech Risk**
   1. What risks do fintech and fintech firms present to the economy and the financial sector? To the housing finance sector? To FHFA-regulated entities? To counterparties of FHFA-regulated entities and other third parties? To mortgage borrowers and consumers?

Given the standards required by federal, state, and government agencies with Dodd Frank, Banking Act, and a host of other regulatory agencies, we agree there is some risk. This is assuming the financial entities that use the services are enforcing their agreements of required regulations, reviewing their security protocols, and performing audits on a consistent basis.

* 1. What risk management practices do industry participants use to address the risks posed by fintech and innovation in housing finance?

Strong agreement language and documents. Regular audit procedures.

* 1. What particular risks to consumer privacy have been associated with fintech? What practices are being used to manage these risks?

Using and exposing and persisting consumer PII within multiple data stores and across multiple online transactions is a particular risk factor commonly associated with fintech.

An increasingly common authentication practice that eliminates PII communication is the use of JSON Web Key Set (JWKS) and JSON Web Token (JWT) authentication used with an OIDC-based identity provider (IdP). Representational state transfer (REST) transactions over SSL will obtain a time-limited JWT using host provided Exchange ID and public key. Once an identity token is established, non-PII KPI can be communicated to and from host services. For example, a client application creates a client assertion JWT using a designated issuer URL and signing key (that the OIDC IdP serves at its JWKs endpoint). That JWT is presented to the host application’s authentication layer to obtain a time-limited access token, which can then be used in REST calls to various host services.

Blockchain is another technology that has great potential but still requires significant mortgage industry investment in transaction standards that will consist of smart contracts and trusted immutable distributed ledgers. The ledger data could be contained in the above IdP-accessible data store. Other private blockchain features such as a private consensus mechanism, timestamp, and hashing would need to get worked out.

1. **Regtech** 
   1. What are the most promising areas for applying technology to regulatory and compliance functions? Please describe opportunities for “regtech” to simplify or improve compliance with FHFA, Enterprise, or FHLBank requirements
2. **Stakeholder Engagement**
   1. What forms of stakeholder engagement are most effective in facilitating open, timely, and continuous discussion on the challenges and opportunities presented by the application of fintech to housing finance?
   2. What are some topics for a housing finance-focused “tech sprint” and how could FHFA encourage participation?