

A. General Questions on 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?

As an originator, we view fintech as the application of technology to drive either more speed or more certainty in the mortgage origination process. We evaluate the goodness of “fintech” along those two dimensions.

Compressing timelines generally reduces costs; the mortgage origination process has high, and increasing, costs tied to manual process and/or outdated technology. Increasing certainty derisks the transaction. From the Primary perspective, the greater certainty of closing you can deliver your customer, and to the homeseller via the preapproval process, the greater chance that homebuyer has of achieving homeownership. From the secondary perspective, greater certainty reduces risk of non-performance and repurchase. Fintech can greatly reduce fraud and human error from the manufacturing process, creating a more liquid and better performing market.

We also need to consider who the technology is benefiting. Here are some potential beneficiaries:

- The customer:
 - If benefiting the customer, which segment?
 - Those who own homes
 - Those looking to buy homes
 - Those who can already qualify
 - Those who may not be able to qualify without the application of fintech
- The loan officer: There are technology products that help sell and prospect with limited consumer benefit
- Secondary market participants: Does the technology facilitate a more efficient secondary market with some ancillary benefit to the primary market?
- Mortgage operations: Is this something that improves processing times?
- Home sellers: Does the fintech create more demand, pushing up home prices?

FHFA should first prioritize the technology that benefits customers, particularly aspiring homeowners.

2. How could FHFA facilitate adoption of “responsible innovation”?

The FHFA can establish risk frameworks for the GSE’s to operate within when evaluating both new technology and new entrants. Using that framework, the GSEs may grant variances from the standard guides that present limited risk and have a demonstrable customer benefit. There is a rich ecosystem of fintech, particularly around delivery of consumer data from primary sources, that can greatly enhance credit decisioning. The initial loans produced from the variance will form the data needed to evaluate a broader deployment.

FHFA should also consider promoting innovation at the new originator level. In all industries, innovation rarely will come from established players. Establishment of criteria for incubation or preliminary GSE approval, and the access to liquidity and technology that GSE approval brings, will bring a wider range of ideas into the marketplace. The entrance requirements for GSE eligibility should be considered in light of industry consolidation and rising costs to originate.

3. 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?

So much of what enables faster, more accessible lending outcomes is the ability to access and use the digitized homebuyer profile data that already exists. Income is the most component of this profile, and income has the tallest barriers that tend to restrict what digitized data is available and what can be used for underwriting in a way that limits innovation, and tends to privilege those with more traditional income profiles.

Digitized access to tax information is one example. A homebuyer’s tax history is often a rich vein of verified information that can enable rapid, nuanced, and accessible lending decisions. This tax data is normally the foundation for granting credit access to those with complicated self-employed and non-W2 income profiles, which aligns with a growing segment of homebuyers who have traditionally struggled with credit access. But getting rapid, real-time access to digitized tax data is prohibitively difficult – tax transcripts require a legacy process with multi-day (or even multi-week) turnaround times that often require multiple paper exchanges with homebuyers. These delays and high documentation demands can discourage first-time homebuyers from even attempting to get into the home ownership market.

This data does already exist in digitized form, and in forms that are already part of a vetting process (the IRS system) – and getting real-time digital access to it would allow new forms of more accessible lending to blossom.

B. Questions on 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.

Fintech that helps achieve credit certainty for typically underserved populations has the greatest potential to benefit the housing finance sector. Most applications of fintech in housing thus far have helped increase speed/certainty of transaction for segments that likely could have accessed homeownership without it. Some examples:

- Automated asset and income validation works very well for W2 owners with established bank accounts.
- The recent wave of cash offer programs cater to larger, single family homes in dense high-earning, urban areas. A recent analysis by Zavvie has shown that the average home price for power buyers has historically been above \$600,000.

The FHFA should evaluate the application of technology to help those that are currently shut out of the housing market. The largest obligation for most aspiring homeowners - rent - is largely absent from the credit decisioning process. The GSEs have made some progress on this front, but the current application only benefits those who have established bank accounts. Several studies by the Urban Institute have shown that consistent on time monthly housing payment is a strong predictor of future payment, and the FHFA should consider additional avenues to obtain rental payment history in an automated fashion other than bank statement account linking. There are a variety of providers - property manage companies, tenant screening companies, and payment processors that are building products to provide this data.

2. 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?

The mortgage lifecycle can generally be divided into specific phases. There is the evaluation of the general credit-worthiness of the homebuyer themselves. This involves the collection of their credit, income, and asset information, verification of the source data, and computation of what financial resources are applicable. Then there are the collateral-specific elements of the process, such as home appraisal, title, hazard insurance, and intended property usage.

Much of the credit evaluation can be done right when the homebuyer is under contract for a

home (or even potentially before), but relies on the sourcing of verified, trustable information about that credit profile. This process can often take days or weeks of document exchange, digitization, verification, manual computation, and back-and-forth iteration with the homebuyer, depending on the complexity of their profile and how marginal they are from a credit perspective.

The greatest thing that can improve efficiency and reduce costs in this phase is (a) superior access to digitized data that is considered sufficiently valid for a profile, and (b) superior immediate decisioning based on that data, that can accurately and in real-time apply the proper underwriting rules to the collected verified data.

With sufficient application of technology, it is possible for a prospective homebuyer to provide their identifying details, their consent for access to their digital data, and the details of their home purchase, and receive an *immediate, automated, real-time* answer to their credit-worthiness for that purchase (and even what things they can do to become credit worthy if they aren't already). The efficiency and time savings in this process, currently done through a mix of manual labor from both the homebuyer and lender staff, would be vast. For equitability, the automation of this process would remove the intimidation aspect of first-time homebuyers not knowing what to do (or not having the time to do it), and thus demurring from engaging in the mortgage process in the first place.

It would also ensure that all possible avenues of mortgage eligibility are discovered based on a homebuyer profile (including new avenues like rent payment / utility payment consistency) rather than just those identified by the personnel involved – leaving no opportunity unexplored and reducing the potential for human-induced biases.

For the collateral process, there are a few major time constraints – the days (or often weeks) of time necessary to execute the appraisal, the days (or often weeks) to execute on the title review process, and the difficult assessment of confirming intended use of the property.

There is major opportunity in the increased digitization of the appraisal process – removing the need for appraisers to travel to potentially remote locations to verify the home, and instead relying on the digital capture of the home status (as is already the standard for hazard insurance actuarial practices) for desktop appraisals and automated appraisals (or appraisal waivers). There is the same value in digitization for title and title insurance – digitization of trusted title records would remove significant cost, time, and stress from the process.

3. 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?

Sources of repetitive or high-stress requests to homebuyers include:

- Repeated exchanges around eligible income and employment information
- Shocks around appraisal and accommodating cases where an appraisal arrives below purchase price late in the process
- Verification of intent around usage of the new property

Getting reliable income data that is considered sufficiently verified and acceptable is the greatest source of repeated requests to the homebuyer. The more that the lender can do to source this data automatically and completely without repeated intervention from the homebuyer to explore eligible avenues, the fewer touches that are necessary in the process and the more the home lending process comes to resemble the e-commerce experience with which first-time homebuyers already have experience. Automation possibilities include integrating with new, alternative sources of verified income information that are digital, immediate, complete, and refreshable, and reducing the time spent reviewing the legacy sources of information (such as paper documents) via optical character recognition and other digitization technologies.

For appraisal – the issue is not with appraisals coming in below purchase price (which is the evaluative part of the appraisal process working as intended). The issue is in the speed of decision. The later the appraisal arrives in the process, the more traumatic an experience it is for the homebuyer to find the necessary assets (or necessary changes to other overall borrowing profile) to execute their transaction while meeting the loan-to-value requirements. If lenders can make earlier use of appraisal waiver decisions, and digitized appraisal experiences that do not require days of execution, these stresses can be reduced or eliminated.

For verification of intent around property usage – lenders are often forced to ask invasive and difficult-to-answer questions to discern if the buyer is really going to use a property as a primary residence, and these questions can often add to a stressful process. With some simplification and codification of acceptable verification rules, this could potentially be automated from existing real-estate-owned, credit, and rental records.

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

The chief challenge is having digitized, real-time access to complete records that are considered sufficiently validated for a QM underwrite. This challenge is especially true for income records, which have disparate private vendors of varying reach and quality that provide very little help for self-employment cases.

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

The acceptance of alternative forms of data to produce a QM underwrite is the largest policy barrier to implementing fintech in the mortgage process. The late 2020 change to the nonQM rule established a framework for responsible income underwriting apart from Appendix Q. We saw this as an affirmation that the typical household, and especially newer households, do not earn income in the ways contemplated by Appendix Q. The GSEs have not yet explicitly endorsed the potential of the newQM rule with tangible, digitally verifiable, alternatives to traditional income qualification, leaving the segments who may benefit from this kind of underwriting to the higher cost nonQM market.

C. Questions on 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?

In recent years many fintech data providers have emerged in the payments space. These range from the universal, such as Venmo or Zelle, to the specific, such as Findigs for rental management. Prior housing payment history specifically is a strong predictor of ability to repay, and we believe other forms of payment and cashflow analysis can be used to supplement or even replace the traditional underwrite using tax returns and a credit score. We hope FHFA and the GSEs lead this effort in opening up additional pilots and pipelines into the AUS that factor in how aspiring homeowners earn and spend their money today vs. when Appendix Q was written.

We have the most difficulty qualifying the following groups, who also stand most to benefit from alternative forms of data:

- Multigenerational households with multiple sources of income
- Self employed borrowers
- Borrowers who have a part-time job
- Thin credit file borrowers

2. 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?

Unconscious bias enters automated systems the same way it enters traditional systems – through the humans involved. For automated systems, that dynamic means that automated systems tend to have the same biases as the people who create them, because the teams constructing these systems project unconscious biases on things like testing data and results interpretation.

Test data and control data sets are key to addressing this dynamic. If there is a well controlled set of digitized test mortgage inputs (e.g. test credit info, test income, test assets, test properties) and outputs (i.e. mortgage judgments) for fintech companies to calibrate against, these teams are much more likely to produce systems that make equitable decisions that reflect the diversity and judgments encoded in the test data.

Thus, a well-controlled, diverse data set maintained by the FHFA could be a critical and highly effective means to drive algorithmic systems developed by lenders in an equitable and fair direction.

3. 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.

A famous recent case of algorithmic bias involved Twitter's cropping of uploaded images based on their facial recognition algorithm. Users quickly noted that the algorithm was significantly more effective at identifying lighter-skinned faces over darker-skinned faces, and a photo with two people with different skin tones would be cropped to favor the face of the lighter-skinned person.

[\(https://www.reuters.com/technology/twitter-finds-its-ai-tends-crop-out-black-people-men-photos-2021-05-19/\)](https://www.reuters.com/technology/twitter-finds-its-ai-tends-crop-out-black-people-men-photos-2021-05-19/)

This was another example where the algorithm was trained – and its results assessed – on a data corpus that had been skewed to privilege certain faces over others, and those faces tended to align with the product team responsible for building and refining the algorithm involved.

An algorithm is largely defined by the data it is trained and evaluated on – so the critical element is to ensure that any lending decision algorithm is trained on data that is reflective of the real, diverse profiles of American homebuyers, and that the decisions made by that algorithm are evaluated according to the equitable outcomes the FHFA wants to encourage for that representative set.

These profiles are often dynamic as socioeconomic factors change, so it would be essential to keep this training data up-to-date with the changes in the borrowing body.

If the FHFA is able to maintain a data set like this – with inputs that mirror the real, digitizable, complete income/credit/asset factors of homebuyers and the decisions that should be made from that data – it would be instrumental in fighting these biases. Even without strict enforcement, Fintech companies would likely make large use of these training sets because of the difficulty otherwise posed in assembling clean training data for algorithms, and that would inevitably steer algorithms to reflecting the outcomes the FHFA wants to drive in lending decisions.

D. Questions on 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?

There are few inherent risks with fintech and fintech firms. The risk lies in how the technology is applied in underwriting. Generally speaking, integrating data of how consumers earn and spend money into the underwriting process will lead to better decision making.

Two risks worth noting are information security and prepayment risk. As information is stored and transmitted more frequently, the risk of a security breach increases. Having information dispersed across smaller players however is generally less risky than a single point of catastrophic security failure like a breach at one of the three credit bureaus. FHFA should ensure any fintech partner processing consumer credit information meets rigorous security standards, but again, there is no inherent security risk in newer fintech players than established entities.

A refinance-specific risk in the application of fintech within the mortgage industry is increased prepay speeds. There may be a tension between FHFA-regulated entities in providing solutions for customers to obtain lower rates and counterparties of those FHFA-regulated entities who want a stable prepayment profile. While consumers want access to fast and low cost refinances to take advantage of rate movements, a perfectly streamlined refinance process will negatively affect the prepay profile of the UMBS. This tension does not exist for purchase money mortgages. FHFA and the GSEs may consider limiting certain innovations to the purchase market only.

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

When deploying a new technology to support underwriting, lenders should prudently apply principles of conservatism. A lender should consider increasing their loan loss reserve calculations for loans that are utilizing new approaches to credit underwriting if they are not obtaining relief from representations and warranties via an AUS.

From a technology perspective, the critical element in risk management is in discipline around stewardship of customer data. Any fintech needs to have a strong internal data governance program that enforces proper software development practices. This includes a full catalog and classification of the data being maintained internally, vendor governance to make sure they're following the right protocols around SOC and ISO compliance, and internal controls that ensure least privilege access to data and frequent external audits of system integrity.

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

For mortgage lending specifically, the consumer privacy risk is bound on the sensitivity of the data (which is extremely high) and the retention requirements (which require that companies maintain sensitive data for many years, increasing the impact of any system compromise).

Mitigation begins around stewardship, and stewardship begins with proper classification of the data involved. Any consumer data that a fintech handles needs to be classified according to its sensitivity (depending on whether it's publicly available, not publicly available, and financially sensitive).

This classification then needs to inform a technical approach that enforces least-privilege on both a human and a systemic level. The best way to prevent data breaches and respect customer privacy is to have the least amount of sensitive data around, to replicate sensitive data in the fewest possible places, and grant the fewest possible systems access to this data.

Following established industry practices around SOC and ISO compliance – and following strong security-driven software engineering practices with qualified engineering teams – is the essential and enduring practice.

F. Questions on 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?

We encourage FHFA and FHFA-regulated entities to engage both lenders and fintech vendors collectively. FHFA and the entities will define policy objectives and housing goals. Lenders are most in tune with the origination problems that get in the way of achieving those goals. Fintechs bring solutions. With the abundance of fintech players, FHFA and the GSEs should be wary of engaging without lender input or sponsorship of a particular solution. In our experience we've seen many fintechs in housing that present solutions that don't map well to lender problems.