REFORMING MBS COLLATERAL MANAGEMENT

Michael R. Drayne

December 2023

CONTENTS

EXECUTIVE SUMMARY

- Mortgage-backed securities programs (dominated by those of Fannie Mae, Freddie Mac and Ginnie Mae) create the need for third-party custody of the loan instruments that are collateral for the securities. Document custodians certify that the collateral instruments meet program requirements, and maintain safekeeping over their life to preserve the ability to enforce loan terms if necessary. Custody requirements center on the note, because of its status under law as a negotiable instrument that can be enforced by its holder.

- The MBS collateral management system was designed for the management of paper instruments, and retains this orientation today. The paper-centric architecture does not take advantage of the ability of digital information to be available to widespread locations simultaneously, and to move instantaneously at no marginal cost.

- The emergence of eNotes, meaning notes for which the authoritative copy is in digital form, might have been thought to mark the beginning of the end of the paper-based "legacy system" for collateral management. But the market share of eNotes remains well under 10% and is not growing rapidly. Originating eNotes requires the maintenance of an alternative channel for collateral management, which results in additional costs.

- While the legacy system has accommodated eNotes, there is no vision for what a future state will look like, or transition plan for getting there. This inefficient, dual channel "hybrid" system appears positioned to be the status quo for an indefinite period.

- A realistic scenario for reform would involve accepting the ongoing generation of paper notes ("pNotes") while revising policies and practices to limit the extent to which pNotes need to be moved once stored, and increasing reliance on digital tools to maximize efficiency and pave the way for a true all-digital mortgage origination and servicing process.

- Three areas of opportunity stand out as being logical targets for technology-driven re-engineering in the legacy collateral management system:
    - *Immobilization of paper* by revising program policies and practices to limit the extent to which paper instruments need to be moved once originally stored, and instituting a consistently applied digitization step to create images of custodian-held documents that can be referred to in place of paper over the life of the loan.

  - *Automation of certification* by using advanced technology to ascertain, without human intervention, that the paper instruments meet agency standards, thus creating a valuable digital validation of the original stored document.
  - *Centralization of information* through creation of a mortgage collateral exchange, allowing up-to-date information about collateral location and status to be available to accredited market participants without today's reliance on recurring, often cumbersome, bilateral data transmission procedures.

- Progress on the above reform opportunities would in part be intended to serve as proof of concept for a later-stage reform effort that would seek adoption of digital tools and practices by actors operating at a remove from the housing finance system – especially in the administration of foreclosure proceedings, much of which is determined by state law.

- Despite broad awareness of its inefficiencies, MBS collateral management has lacked a catalyst for reform. The most likely method of generating momentum for change is collective action on the part of the market-leading originator/servicers who are the clients of the document custodians and the approved counterparties of the agencies. Collective action could take different forms, but should involve a clear vision statement backed by a formal organizational structure to drive adoption of modernized business practices. The vision should be compelling to firms of any size given the objective of attaining 100% adoption for a re-engineered system.

- An immediate next step would be to seek consensus for a reform effort on the part of the market-leading originator/servicers, and address the facets of this research project that require a greater degree of institutional backing. Examples of the latter are: engaging with the Washington-based organizations (including the agencies) that would be central to a reform effort, fostering collaboration for the development of an economic case for reform, and investigating the potential for a collateral data exchange. Formation of an advisory group, and public communication about it, would assist with these tasks.

- Looking further ahead, a reform project would focus on the development of market solicitations that would detail future state operational arrangements and set the stage for reform operationalization.

- The earlier successful digitalization of the securities industry, the MBS portion of which the mortgage collateral system directly supports, should be seen as an illustration of the benefits of collateral management reform, and inspiration that it can be achieved.

INTRODUCTION

In the late 1960s, the challenges of settling increasing volumes of trading in paper securities reached crisis proportions. Under pressure from Congress but driven largely by consortia of private sector market participants, the securities industry transitioned away from paper, and toward reliance on a small set of centralized systems for managing issuance and transactions.

Today's vast agency mortgage-backed securities (MBS) marketplace is based on the Federal Reserve Bank as central depository of issued securities, which (through its Fedwire system) is also the interbank settlement system for member banks. The member-owned Depository Trust and Clearing Corporation (DTCC) serves as the clearing and settlement agent for the broader universe of participants in the MBS market.[1] Efficiency and reliability is thereby fostered through utility-like structures that operate at great scale and effectively serve the needs of market participants and, ultimately, U.S. homeowners.

"The system for managing MBS collateral has not undergone modernization comparable to that of the market for transacting in the securities themselves."

But underneath the market where the securities themselves are traded is a supporting market in which the collateral for the securities is created, evaluated, stored, moved when needed and pledged as security for the financing of the underlying loans. This collateral is the loan documents – the security instrument, and most importantly the promissory note – that allow the terms of the home loan to be enforced.

The system for managing MBS collateral has not undergone modernization comparable to that of the market for transacting in the securities themselves. The system is still dominated by paper, and relies on a welter of bilateral arrangements and processes to manage the interaction of market participants – it is decentralized and under-automated, the opposite of the larger MBS transaction system it serves.

This white paper has been prepared as part of a research project commissioned by the Housing Policy Council (HPC) in June 2023 to:

[1] Though its subsidiary the Fixed Income Clearing Corporation, which in turn relies on the services of two large clearing banks.

- Examine the state of digitalization within the management of MBS collateral, and
- Identify actions that could be taken to increase the pace of progress.

The project combined independent research using publicly available material with interviews of personnel from firms that participate in or otherwise have informed views about MBS collateral management issues. Twenty-nine interviews, in which 15 firms were represented, were conducted from July to December 2023.

Some notes on terminology:

"MBS collateral" means the loans and associated documentation that collateralize MBS (as distinct from the real property that is the collateral for the underlying loans). Included in this category are any loans that fall within the agency programs (see next item), private label MBS or the Federal Home Loan Bank "acquired member asset" programs – all of which require third-party custodial services.

"The agencies" means Fannie Mae, Freddie Mac and Ginnie Mae, the sponsors of the MBS programs that constitute about 70% of U.S. mortgage debt outstanding.[2] Fannie Mae and Freddie Mac are sometimes referred to as "GSEs," short for government-sponsored enterprises. In some contexts, "agencies" could also include the Federal Home Loan Banks and private label MBS programs sponsors, although the market of these programs is only a fraction of that of the three main agencies.

"Document custody" is the traditional name for the field that is studied here, but it is mostly not used in this report because it is an inadequate description of the business as it will be evolving, which should increasingly involve bodies of digital information that can be available anywhere. The firms that manage the collateral, however, are referred to here by their traditional name "document custodians," in keeping with how they are labeled in the agency program requirements.

"Digitalization" is used in a broad sense, to mean the adaptation of systems and processes so that they can be driven more completely by technology, whereas "digitization" is used more narrowly to refer to the conversion of something specific, like a paper document, to digital form.

[2] Market share as reported in the Urban Institute Housing Finance Policy Center's "Housing Finance at a Glance" publication for September 2023.

"Digital mortgage" means an idealized version of the mortgage origination process in which every aspect of it is digitally based (i.e., no paper documents).

"eNote" means a loan in which the authoritative version of the note is in digital form.

"eMortgage" means any loan in which the note is an eNote, even though it might also utilize paper documents. (Any digital mortgage would be an eMortgage, but eMortgages may or may not be digital mortgages.)[3]

A premise of this white paper is that it is easy for even experienced practitioners to get lost in the myriad facets of digitalization, and the quest for the digital mortgage – which is why there is value in close study of this one specialized but large function, where fresh thinking about a handful of topics might lead to a significant modernization of an area that has been lagging.

Section One provides background on the collateral management function, and how it has evolved into a hybrid system with two very different process channels.

Section Two suggests opportunities for reforming the legacy/hybrid system, and suggests other areas that would eventually need to be encompassed if comprehensive reform was to be achieved.

Section Three explores the role of collective action in mobilizing and institutionalizing a reform effort, and suggests first steps for a reform initiative.

Appendices One, Two and Three contain elaborative information on the main topics of the paper.

No doubt some of the content of this white paper will prove to be off-base when exposed to a wider audience of practitioners. It should be seen, then, not as a prescriptive solution, but as a foundation for wider dialogue and analysis that can eventually lead to the modernization of MBS collateral management that has been frustratingly elusive to this point.

Finally, although collateral management is treated as discrete subject matter in this white paper, in practice it is interrelated with other aspects of the housing finance industry's digital infrastructure. It would be useful for a continuing project to fold in other questions about how

[3] While perhaps confusing, and not consistently applied in the broad marketplace, these definitions of eNote and eMortgage are uniformly used by the agencies and should be considered standard terms.

the management of mortgage data can be modernized to improve the working of the of the housing finance system as a whole.

SECTION ONE: OVERVIEW OF THE CURRENT STATE

Background on MBS Collateral Management

An essential feature of MBS programs is the separation of a loan asset into constituent parts that are owned, managed or guaranteed by different entities. The loan instruments that serve as the collateral for the MBS must be validated and kept secure for the needs of present and (potentially different) future owner/manager/guarantors, particularly the loan “servicers” that administer the operations that take place over the life of a mortgage loan. This collateral management function is required to be performed by qualified document custodians under the agency programs.

Document custodians perform their function on behalf of the originator/servicer that is their client, but importantly also on behalf of the agency, which has made guarantees to security holders that depend in part on the reliability of the collateral. Their responsibilities are thus fiduciary in nature, and as a result they are required to be under the supervision of a bank regulator, and operating under trust powers granted by that regulator.[4]

Document custodians perform the following general functions:

- Certify (and recertify, after certain events occur) that the documents received are correct and in order, and match the data submitted separately to the agency at the time the loan is sold/securitized.
- Manage the collateral to assure its security while the loan is outstanding.
- Manage requests for release of collateral documents, such as to administer loss mitigation activities or to reflect the eventual payment in full.
- Manage transfers of collateral, or custodial responsibility.

The MBS collateral management function is based on the mortgage promissory note (evidencing the debt and borrower’s promise to repay). Mortgage loan notes are well-established in commercial law as negotiable instruments, meaning designed to be easily transferable and enforceable by their current holder provided certain basic conditions are met

[4] There might be some slight differences in agency eligibility criteria. It’s not clear from agency program materials, for example, if all three require operation under trust powers for every category of document custodian, or whether a Federal Home Loan Bank is automatically eligible.

(such as a valid endorsement from a previous holder).[5] This means that the form and control of mortgage notes are critical to their effective use. All MBS custody requirements are therefore centered on review and control of the mortgage note. (Included in the category of "note," for these purposes, are documents that change or otherwise directly bear on the note in some way, such as allonges, modifications, assumptions, conversions, powers-of-attorney and lost note affidavits.)

"All MBS custody requirements…are centered on review and control of the mortgage note."

The secondary concern of MBS collateral management is the security instrument (that secures the real property as collateral for the loan). Security instruments – which are usually recorded in local land records - are also transferable, through separate assignments. Unlike with the note, the treatment of the security instrument (and assignments) in MBS custody programs varies within the agency programs, such as in whether and when it is to be conveyed to a custodian, and whether the original is required or a copy will suffice.[6]

The myriad other documents generated in the process of a mortgage loan origination play little role in agency custody programs, although some may also be the subject of custody arrangements for other reasons.

To give a sense for the universe of interested parties, there are five main constituency groups in the world of MBS collateral management:

- The agencies that administer the main MBS programs
- Document custodians
- The mortgage originator/servicers that are the clients of the document custodians
- The warehouse lending banks that rely on collateral-related controls to secure financing interests in the period before a loan's sale or inclusion in an MBS
- The vendors/service providers that operate in this arena[7]

[5] Though differences among state laws, and between state laws and the Uniform Commercial Code, allow for a surprising amount of variance in how the basic principles underlying loan instruments can be interpreted.
[6] The general principle that renders the security instrument secondary to the note is that its recordation in land records makes physical possession of the document less necessary.
[7] There is some ability to outsource functions within these broad areas to third party providers (most directly stated in Fannie Mae's program requirements), who may not meet the supervision requirement that full-fledged document custodians must meet – but this has been a problematic area within the Ginnie Mae program: there have been two

There are 40 document custodians listed as being approved by the agencies currently, according to their published lists.[8] The number of firms that operate across all the agency programs, and currently take on new clients, is almost certainly much smaller, however.

The Legacy System

The defining feature of MBS collateral management is that it is built around the need to manage paper loan instruments. Technology has increasingly been deployed, including in the development of digital signatures and notes, but the basic structure of the industry has not fundamentally changed. Decades into the digital revolution, MBS collateral management – and its cost structure – remains rooted in the physical world.

The essential fact is this: once loan terms are reduced to a paper note ("pNote") that has been "wet-signed" by a borrower, that document is considered authoritative in the eyes of the entities who determine the rules (or influence working conventions). This limits the extent to which technological improvements can be brought to bear. This is true even though a pNote is populated by digital information that is stored in whatever loan origination system (LOS) is used.

Here is how the "legacy system" still mostly works:

- Loans are memorialized as wet-signed pNotes.
- The pNotes are transported to warehouses managed by document custodians, where they are reviewed at least in part by human beings ("stare and compare") and placed into long-term storage.
- If the owner of the asset or the custodian changes, the collateral might need to be moved to a different location. If it is moved to a different location, it will need to be re-reviewed (to an extent that depends on the specific circumstances), again at least partly by humans.
- If the borrower defaults, the collateral might need to be retrieved to play a role in the loss mitigation or foreclosure process, involving its delivery and handling by additional people in different locations.

---

instances since 2020 in which large-scale physical transfers of collateral documents became necessary because Ginnie Mae declined to approve a custodial entity or arrangement.

[8] As of July 2023.

- When the loan is paid in full, the collateral will be retrieved and returned to the servicer or possibly the borrower, requiring more delivery and handling.

This is not to say that automation is not utilized in MBS collateral management. Many paper documents are imaged, some processes are automated, and digital documents have been provided for.

But on the whole the legacy system in collateral management does not take advantage of the ability of digital information to be available to widespread locations simultaneously, and to move instantaneously at no marginal cost. Furthermore, there does not appear to be any overarching vision for how the legacy system should adapt to the digital age, to which stakeholders could align their efforts.

"…the legacy system in collateral management does not take advantage of the ability of digital information to be available in widespread locations simultaneously, and to move instantaneously at no marginal cost. Furthermore, there does not appear to be any overarching vision for how the legacy system should adapt to the digital age…"

The slow pace of modernization in MBS collateral management negatively impacts the key market participants:

- Servicers (and ultimately consumers, it stands to reason) bear the costs and risk of the legacy system's continued dependence on costly paper transportation and management, and repeated human intervention to process the information in varied locations.
- For document custodians, the demands of the legacy system keep resources tied up in warehouse real estate and lower-skill jobs, and limits opportunities to innovate.
- The agencies have imperfect knowledge about the location and status of their collateral (which they deploy laborious manual processes to keep track of, in the case of the Fannie Mae and Freddie Mac, or simply do entirely without loan level knowledge of, in the case of Ginnie Mae).

The conclusion of this research project is that the persistence of this highly inefficient legacy system is due mostly to a mixture of two factors:

a. A genuine belief – or assumption – on the part of the agencies and the legal system, that if a pNote is created, the procedures embodied in the legacy system are necessary for ensuring that the note can play the role for which it is designed.
b. Longstanding inertia – the ongoing failure of various stakeholders, owing to competing priorities, to identify new, technology-driven methods for managing MBS collateral that could improve efficiency without weakening the security it provides.

While it seems impossible to determine with any confidence how much of the explanation is (a) and how much is (b), the balance of this white paper will argue that reforming the legacy system is plausible and should be pursued, even as market participants continue to grapple with the challenges of transitioning to digital documents at the point of origination.

Giving credence to the plausibility of a reform effort is the fact that the housing finance reform proposals developed in Congress from 2013 to 2018 (the "HFR proposals") explicitly contemplated – albeit in differing forms – a centralized registry for mortgage loan information that would in part provide for centralization and digitalization of the custodial function. These proposals were largely motivated by a perceived need to address problems that had become apparent during the aftermath of the housing finance crisis some years prior. But the point is that large-scale restructuring of collateral management is not a new concept, and appeared important to lawmakers at a time when housing finance was under unprecedented congressional scrutiny.[9]

> *"...the housing finance reform proposals developed in Congress from 2013 to 2018 explicitly contemplated a centralized registry that would provide for digitalization of the custodial function."*

Enter the eNote: the Legacy System becomes a Hybrid System

The logical solution to the inefficiencies of the legacy system might seem to have emerged with the incorporation of eMortgages into the housing finance infrastructure.

The laws that laid the foundation for a transition to digital mortgages date to 1999 (the Uniform Electronic Transaction Act, or UETA) and 2000 (the Electronic Signatures in Global and National

[9] The main HFR proposals were the PATH Act of 2013, the HOME Forward Act of 2014, and the Johnson-Crapo housing finance reform bill from 2018.

Commerce Act, or ESIGN). Fannie Mae and Freddie Mac had each purchased their first eMortgages by 2005, and Ginnie Mae, slower to adapt its program, first provided for their inclusion in securities in 2021.

Given the note's preeminence as MBS collateral, the inclusion of eMortgages in the agency MBS programs was a significant step, and could be thought to mean that the solution to the disadvantages of the legacy system was at hand, and the transition to a digital future assured.

An eNote – the unique, tamper-evident and authoritative digital equivalent of a pNote – is originated using specialized generation and closing technology, and tracked in a single online registry which also contains an online delivery system for transferring it. eNotes are stored in eVaults, which can be procured from vendors that specialize in digital mortgage technology. Fannie Mae and Freddie Mac are able to certify most eNotes automatically, limiting the need for human validation of their accuracy and compliance. These attributes should be a means of alleviating the resource-intensive limitations of the legacy system.

Looked at more closely, however, the picture is not so encouraging. The agencies, while deserving of credit for the work that went into facilitation of eMortgage purchase/securitization, have not gone beyond simply establishing them as an alternative to paper – the agency program requirement documents to which eMortgage requirements have been added are otherwise not very different from before eNotes even existed. Paper vs. digital is treated as a market choice, and there is no evident provision made for an eventual phaseout of the legacy system.[10]

"…eMortgage adoption has plateaued at notably low market share levels."

It's hard to argue that a more ambitious approach should have been taken, however – simply making sure that the very different animal of the eNote could work at all was enough of a challenge – and the bolted-on approach seems borne out by the reality that many years after their introduction eMortgage adoption has plateaued at notably low market share levels.

[10] Two papers published jointly by Fannie Mae and Freddie Mac under the Uniform Mortgage Data Program provide insights into these agencies' earlier analysis of the obstacles to eNote adoption ("eMortgages," August 2016) and efforts to overcome the obstacles ("GSE efforts to improve eMortgage adoption," November 2017). Many of the obstacles described remain present, to some extent.

The table below (published by MERS, which maintains the eRegistry that all eMortgage originators are required to use) tells the story: [11]

Figure 1: eNote production as a share of MERS system registrations

Year	Month	eNote Registrations	MERS System Registrations	% eNotes
2023	Nov	17,938	246,545	7.28%
2023	Oct	18,372	278,383	6.60%
2023	Sep	18,375	284,090	6.47%
2023	Aug	22,313	335,089	6.66%
2023	Jul	20,035	303,811	6.59%
2023	Jun	22,023	341,713	6.44%
2023	May	22,371	331,619	6.75%
2023	Apr	19,525	276,777	7.05%
2023	Mar	20,282	302,172	6.71%
2023	Feb	16,394	216,034	7.59%
2023	Jan	14,077	193,517	7.27%
2022	Dec	16,392	256,400	6.39%

Data Source: MERS® Systems

(It should be noted that because not all loans are registered with MERS, the actual market penetration of eNotes is even lower than the percentages shown in the "% eNotes" column in the table.)

The combination of a lack of agency-driven reform policy for the legacy system plus the low market penetration of eNotes has resulted in development of a two-channel collateral management system – a "hybrid" system:

> *"The combination of a lack of agency-driven reform policy for the legacy system plus the low market penetration of eNotes has resulted in development of a two-channel collateral management system… It is not clear how these two channels will converge…*

- The first (legacy) channel relies on use of the pNote throughout the life of a mortgage loan.
- The second (eNote) channel relies on a digital instrument throughout the loan's life.

[11] MERS (Mortgage Electronic Registration Systems Inc.) is the nationwide online registry for ownership of loans and mortgage servicing rights. It serves as the mortgagee in the land records for registered loans.

The methods used by these two channels to manage the collateral are different. It is not clear how the two channels will converge, other than by eNote adoption reaching 100% - not an optimistic scenario, given current trends.

The downstream impact of eNotes has been mixed. That it has allowed for automated certification in the Fannie Mae and Freddie Mac programs is a significant program improvement. But there has been little progress toward a consolidated data management approach that could be used for information sharing across the system – that is, incorporating both pNotes and eNotes. In addition, warehouse lenders describe today's eNote system as being flawed, most importantly because it requires in some instances that they release their interest in a warehouse loan before it has been repaid.

Market participants have the unappetizing choice of confining themselves to the legacy paper-based system, or investing additionally in the development of eMortgage capability – but with no end in sight for the demands of managing two separate processes, and relying on archaic methods of distributing information.   MBS collateral management does not represent a compelling case study for how technology can improve efficiency.

The present dilemma explains the approach taken in the remainder of this paper. It is not reasonable to assume that eMortgages will displace the legacy system in the foreseeable future and on their own bring full automation to collateral management – the determinants of whether or not a note will take paper form are too widely dispersed and the transition to eNotes is proceeding too slowly.[12] True "dematerialization," which would entail ceasing the production of pNotes and digitizing the legacy collateral, would require a level of investment that today is not economic or realistic.

"It is not reasonable to assume that eMortgages will displace the legacy system in the foreseeable future and on their own bring full automation to collateral management…"

[12] The MERS website references "at least six components that need to work together to prove control of eNotes: eCommerce laws, investor requirements, e-closing platform, an eVault provider, eNote language within the eNote the borrower is going to sign and the MERS® eRegistry," which it refers to as an "ecosystem," and gives a sense for the commitment necessary to implement the eNote collateral channel.

The more logical path to modernization of the collateral management function involves re-examining basic principles to **reform legacy policies and practices**, and **maximize the integration** of the two channels that make up today's hybrid system.   Section Two outlines specific examples of how this could be done.

SECTION TWO: REFORMING THE HYBRID SYSTEM

Goal: Elevated Reliance on Digital Information

The development of the eNote was a necessary and valuable step forward, but looked at systemically it appears to have been more additive than transformative – eNotes require alternative infrastructure and processes, but in the view of more than one project interviewee have not lowered the costs of managing collateral. As long as today's hybrid system exists, it is hard to see how this would change even if eNote market penetration rises to five or ten times what it is today.

In addition, the product of the collateral origination and management practices in use today is a disjointed system in which valuable information is buried; too many manual processes are needed to excavate and exchange it.

This leads to the question at the heart of this inquiry: are there feasible collateral management reforms that could address these shortcomings?

This section of the paper presents three areas that offer opportunities for reform. It includes legacy system policies and practices within the scope of concern.

The goal is a modernization effort that moves as far as possible toward two objectives:

- Elevated reliance on digital information
- Harmonization of the hybrid channels into a more holistic system.

Three Areas of Opportunity for Reform

In…the collateral management current state, three areas stand out as being logical targets for technology-driven re-engineering.

In this project's examination of the collateral management current state, three areas stand out as being logical targets for technology-driven re-engineering. Any campaign of reform would have to address these areas to have meaningful impact on the function as a whole.   (Appendix One contains additional notes about these reform opportunities.)

Immobilization of Paper

The previous section explained why a practical approach to reform should acknowledge that pNotes will be part of the landscape for many years to come. "Immobilization," the first reform opportunity, is therefore aimed at confining the need to physically handle paper to a narrow window at the beginning of the custody process. This could be accomplished in three ways:

- Standard document custody agreements should contain boilerplate language that provides for the assignment of a document custodian's responsibilities from one client to another, at the option of the client. This assignment of responsibility would obviate the need to physically transfer the paper document in the event of an asset sale, as is often necessary today.
- If paper documents were not moved as the result of a transaction, recertification (which today might require re-examining the paper documents) should not be necessary. Fannie Mae and Freddie Mac already provide for streamlined recertification procedures when there is a transaction in which the custodian does not change – these procedures should be harmonized, and adopted by Ginnie Mae, which today requires full recertification regardless of whether the document custodian is changing.
- Either before leaving the closing agent or upon receipt by the document custodian, pNotes should be imaged and converted to structured data according to a standardized method, such as under the auspices of MISMO[13]. This would create a digitized version of the authoritative paper version that, upon certification (described in next chapter), should have equivalent standing to an eNote, laying the groundwork for integration of the competing hybrid system p/eNote channels once certification has occurred (as described further in "Centralization of Information" below).

"Immobilization…is therefore aimed at confining the need to physically handle paper to a narrow window at the beginning of the custody process."

These three reforms would limit the potential movement of a pNote, and create a digital version of it that could be utilized over the remainder of the loan's life.

The question would be whether all the system participants, including the court officials that are involved with foreclosure proceedings, would recognize the sufficiency for their purposes of a pNote that is accessed only in its

[13] MISMO, a subsidiary of the Mortgage Bankers Association (trade association), describes itself as the "standards development body for the mortgage industry."

digitized form – especially since some state laws require that the note be produced as part of a foreclosure proceeding. This topic is discussed later in this section (under "Next Frontier of Reform").

Figure 2 below shows the impact of a fully realized "Immobilization" proposal on collateral management (involving the use of a data exchange, as described later in this section).

Figure 2: Impact of the "Immobilization" proposal

POTENTIAL MOVEMENT OF THE pNOTE:

In the Legacy System

1. Closing agent to warehouse lender
2. Warehouse lender to permanent custodian
3. Non-liquidation release to servicer
4. Transmission from servicer to foreclosure agent
5. Return from foreclosure agent to servicer
6. Return from servicer to permanent custodian
7. Asset sale-driven transfer to a new custodian
8. Paid in full (liquidation) release to servicer
9. Paid in full transmission from servicer to borrower

In a Reformed System:

1. Closing agent to permanent custodian; imaged to exchange

(In an asset sale, the assignability of a custodian's client responsibility would eliminate the need to physically move collateral.)

(In all other cases, the ability to view the pNote and accompanying data on an exchange would eliminate the need to move the collateral so it could be physically handled.)

Automation of Certification

One feature of the collateral management status quo is that certification is mostly a "gating" function that is accorded little residual value once a loan is allowed to be purchased or pooled under the agency programs.[14]

In these reform proposals, by contrast, certification is the action that can close the gap between paper and digital that opens when different choices are made during the origination process about which form the note will take.

- As described above, the paper custodian ("pCustodian") would be responsible for converting all pNotes entering the custody process to an image and structured data. This would be a utility-like function, in that the images/data would need to be consistent (hence the value of involvement by a standard-setting organization, such as MISMO) and easily available to any future users of the note.

[14] Ginnie Mae makes a distinction between initial certification and final certification, which must occur within 12 months of security issuance. Fannie Mae and Freddie Mac do not have a comparable requirement.

- Were this condition to be established, it would create the opportunity for competition in applying technological innovation to collateral management, in terms of efficiency, cost savings and risk control. A primary goal would be auto-certification, meaning the ability to certify without human intercession that a note meets all requirements of the agency program under which it has been submitted to a document custodian.
- In addition to approving a loan for purchase or securitization – the original purpose of certification requirements – certification could have the additional benefit of validating for future users of the note the electronic version of it prepared by the pCustodian, so that recourse to the physical pNote is no longer deemed necessary.
- Auto-certification therefore has the potential to translate a pNote into an eNote equivalent, closing the gap between paper and digital within days of loan settlement.

An analysis of technology's current readiness to perform auto-certification on pNote collateral is beyond the scope of this research project. Two things can be reported, however:

- Project interviewees report that some aspects of certification are automated today, though others continue to rely on human inspection.
- A review of developments in "intelligent document processing (IDP)," which advances on long-established optical character recognition (OCR) technology to integrate machine learning and other applications of artificial intelligence (AI), lends credence to the view that the ability to automate loan/pool certification is only a matter of time and persistence.

"Auto-certification…has the potential to translate a pNote into an eNote equivalent, closing the gap between paper and digital within days of loan settlement."

A premise of these first two reform opportunities is that they offer the potential for significant cost savings because of the reduction in the need for movement and repeated human retrieval and review of the paper. This potential for cost savings needs to be validated in a next-stage effort.

The impact of this would largely fall on document custodians, who would need to re-structure their use of resources. But this is a well-understood reality – the document custodians have sought to increase technology-driven efficiencies for many years already, and in any case reforms would realistically only take hold over a long phase-in period, providing time to plan and execute business model adjustments such as the gradual scaling down of investment in physical plant operations in favor of greater technology-driven innovation (such as for automated certification).

Centralization of Information

In today's system, electronic information about MBS collateral is shifted among market participants on a bilateral basis, using a variety of closed systems and manual or semi-manual processes. When information is needed in some place for some purpose it is moved there, using a variety of tools, so the purpose can be accomplished. But these closed systems do not build on each other – there is no accumulation of information in a central location to make it easier and faster for all system participants to make use of it.

Examples of collateral information transfer issues that could be improved by centralization:

- Continuing reliance on paper to convey notice of a warehouse lender's interest in a note (i.e., bailee letters), and to facilitate settlement of warehouse loans.
- Lack of connection between the processing platform used by most document custodians and the certification systems maintained by Fannie Mae and Freddie Mac, necessitating manual workarounds between client/document custodian/agency.
- Lack of information at Ginnie Mae about the status of loan level collateral, leaving the agency able to perform collateral management only on a pool level basis.
- Lack of certainty about the location of agency collateral generally, with consequent need for continuous manual reconciliation processes between agencies and individual document custodians.

To address these inefficiencies, a third reform opportunity would be the creation of a centralized data exchange for loan collateral information. All participants in the MBS collateral management system would be able to access the exchange, and the defined set of loan data would be directed into the exchange at the earliest possible point and whenever it changed. To the extent possible, the exchange should be the mechanism for transferring information, and a basis for automating component processes within MBS collateral management that are today handled through more primitive methods.

"A third reform opportunity would be the creation of a centralized data exchange for loan collateral information."

A central focus of the exchange would be the location, control and (certification) status of the note – which is at the heart of warehouse lending. Exchange functionality could therefore be expanded to include serving as a clearinghouse for warehouse lending transactions. Most of the key information exchanges that drive warehouse lending would be naturally and more efficiently managed through a centralized exchange – including the settlement of the warehouse loan repayment.

As a real-time system of record, a mortgage collateral exchange would provide timely assurance to the agencies about the location and status of their collateral that is not available today. It would lay the groundwork for automation within the system (such as by transitioning inventory control from manual, custodian-specific projects commissioned by individual agencies for their own use to a single holistic process serving all stakeholders) and externally (such as by serving as a nationwide platform for accessing certified notes in foreclosure proceedings).

This concept of a centralized exchange for standardizing and expediting exchanges of collateral-related information (and money) has long been contemplated by industry participants, and has ample precedent.[15] Its failure to materialize is more a reflection of lack of concerted collective effort than practical infeasibility.

While it might seem daunting to contemplate replacing a variety of long-established processes with an overarching system such as a data exchange, the ability to harness the advanced technologies available with cloud computing adds a new dimension, including the ability to tap into existing infrastructure with advanced capabilities way beyond what an individual firm would have been able to deploy not long ago. A recent article by Deutsche Bank discussed the ways in which advanced cloud computing technology adds value to the custody business in particular.[16] Defining a cloud-based, utility-like structure that would sit at the heart of mortgage collateral management might benefit industry as a whole by channeling developmental efforts in one direction and minimizing uncoordinated firm-level efforts.

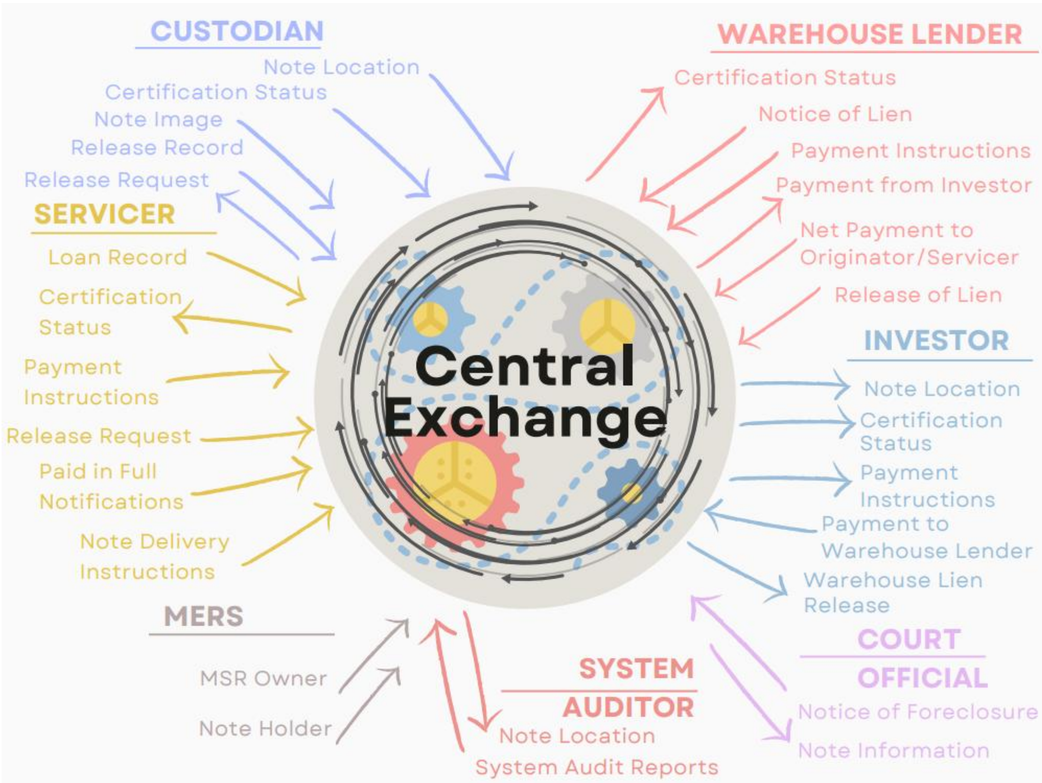
Figure 3 below, though far from complete, notes many of the information/financial flows that could be centralized through a collateral data exchange.

---

[15] At the highest level are the eight financial market utilities – mostly exchanges or one form or another – that have been designated as systemically important by the Financial Stability Oversight Council (FSOC) and are accordingly regulated by the Federal Reserve. Closer to mortgage banking home is MERS, which operates two centralized information repositories that are discussed elsewhere in this paper.

[16] "Cloud of Transparency," Deutsche Bank's "flow" blog, July 19, 2023.

Figure 3: Examples of exchange information/financial flows



Next Frontier of Reform

The reform opportunities described above are primary in that they address the basic workings of today's collateral management system. The aim is a system that is more efficient for its users, especially the originator/servicers and agencies. One of the virtues of this approach is that it could be set in motion by a limited number of actors – assuming a reasonable consensus could be obtained.

Looked at with a wider lens, however, these primary reforms are only one layer of an effort that would have several. Other layers would involve a much larger universe of actors who would need to adopt different behaviors to effect meaningful change – hence the label "next frontier of reform." These layers are beyond the scope of this paper in one sense, but leaving them out entirely would paint an incomplete picture.

One additional layer of reform effort involves users of loan instruments who are only peripheral participants in the housing finance system. The “immobilization” objective described earlier seeks to reduce the need to move certified pNotes, and some of the reasons pNotes are moved today have to do with state laws that require them to be produced in foreclosure proceedings (or to reflect the mortgagors’ payment in full).

This topic is where the “immobilization” and “centralization” opportunities come together. Would the bias for original pNotes be so strong if a collateral exchange, containing an image and verified (via certification) structured data from the pNote, came into wide use? If an eNote is held to be viable in digital form only, why couldn’t the digitization of a pNote (in observance of established standards, and similarly stored and managed) come to have the same legal standing?

A definitive solution would be the enactment of a provision like the one that appeared in one of the HFR proposals, the PATH ACT of 2013, which stated (in connection with a utility-like loan information repository):

> “Notwithstanding any provision of State or Federal law to the contrary, by proper demonstration of registration with the Repository, any holder of an interest in any mortgage-related note shall satisfy any requirement for demonstration of a right to act regarding such note or other registered data that exists in State or Federal law, including any obligation to produce or possess an original note.”

If the right supporting infrastructure was in place, a provision such as this would secure the digitalization of MBS collateral even during the wait for eNotes to reach full adoption.

Minimizing the need for movement of the note in connection with the initiation of foreclosure proceedings is particularly valuable as expanded loss mitigation practices have become prevalent. Two servicer interviewees separately described a common problem:

- a foreclosure process is initiated with an attorney or trustee, requiring that the subject note be retrieved from the document custodian, although…
- foreclosure is averted via loss mitigation – however…
- the note proves difficult to retrieve from the aborted foreclosure process, and may even be lost altogether, requiring that a lost note affidavit be generated and transmitted to the custodian.

Servicers state that administering even a small rate of incidence of such situations drains resources that should be applied to directly serving homeowners in distress. Technology can render the paper-chasing wholly unnecessary if online access becomes authorized and accepted with pNotes, as it already has with eNotes.

An additional layer of reform effort arises from the fact that maximizing the impact of a reformed system would require nearly complete adoption of its key elements. For example, a mortgage collateral exchange should be the vehicle for managing all system collateral originated after a certain date – maintaining partial reliance on the legacy processes would defeat the purpose (and extend the inefficiencies of the hybrid system).[17] Full adoption might entail further modernization efforts – for example, if a mortgage collateral exchange was indexed to the MERS Mortgage Identification Number (MIN), it might require that all system loans be registered on MERS.[18]

The point is that primary reforms, such as the three areas of opportunity described above, are not the whole picture, and need to be considered with reference to the follow-on work that would be necessary to fully capitalize on them.

---

[17] In other words, this reform proposal is prospective, in that it contemplates a system that would operate differently for all collateral originated after a certain date. A more aggressive approach would seek to digitize all existing paper instruments, to make them available on the collateral exchange. The viewpoint of one knowledgeable interviewee was that this would not ever be economical in its entirety, though pockets of opportunity to move legacy collateral into a reformed system would present themselves.

[18] The MIN is a unique loan identifier used in the MERS systems. That the agencies today require MERS registration for all eNotes makes it questionable how long MERS registration should be left as a market choice in the origination of pNote loans.

SECTION THREE: ACTUALIZING REFORM

Explanation for the Status Quo

Having examined the current state of MBS collateral management, and suggested areas a reform campaign could pursue, this section considers what conditions would be important if a reform effort is to take hold, what specific vehicles could be employed, and what work would be needed.

A good place to start might be with an examination of why more reform hasn't already occurred. Why is the legacy system, apart from the introduction of eNotes, so little changed from years past, particularly given that the possibilities of better approaches are well-recognized?[19]

Any answer would be speculative, but the following observations offer some explanation:

- The agencies are situated to drive more robust reform through their control of MBS program requirements but have lacked the incentive to do so. As noted above, they could have laid out a larger program for ultimate dematerialization in connection with the introduction of eNotes, but they limited themselves (not unreasonably, given the slow growth of eNotes) to simply facilitating the addition of this digital feature to their programs. Fannie Mae and Freddie Mac, which operate across a wide front, are probably reasonably content with the status quo, which delivers the information they are most concerned with (concerning certification) though their proprietary systems. Ginnie Mae is less content with its more primitive system, but its state of perpetual under-resourcing has limited its ability to invest in reform. A key fact for all the agencies, however, is that the inefficiencies of the legacy system are mostly borne by the servicers. Re-engineering the system to make it less costly and more efficient for servicers is not at the top of the list of agency concerns.

---

[19] For example, in addition to the previously cited HFR proposals, a 2012 FHFA white paper ("Building a New Infrastructure for the Secondary Mortgage Market"), in contemplating a securitization technology platform that would serve multiple securitization programs, made reference to the platform having the ability to "monitor and direct document custody." A 2021 white paper published by Iron Mountain ("Custodial Workflow: The Final Frontier of Digital Mortgage"), noted that "while many elements of the mortgage landscape are being transformed with technology, custodial workflows are one of the few areas where a digital approach has not yet been successfully adopted."

- Document custodians appear to see themselves as captives of the status quo – more likely to act on reform measures based on broad-based demand for change from their clients and the agencies than to be change leaders on their own initiative (except for the changes that can be implemented within the bounds of current program policy).
- Originator/servicers have scant ability to effect change in collateral management practices on an individual firm basis, and assimilating the unprecedented volume of changes to government and program servicing/loss mitigation policy over the past decade and a half has left little room for other projects.
- Also contributing to acceptance of the status quo is the reliance, in some jurisdictions, on production of the pNote as part of foreclosure proceedings. The contention over the integrity of the foreclosure process is recent enough, and the policy evolution toward minimizing foreclosures clear enough, that appetite for streamlining anything having to do with foreclosure (such as by reducing the need to produce paper notes) is probably limited.[20]
- Inefficiency aside, the legacy system mostly works. Systemic reform often arises out of a crisis, and MBS collateral management, whatever its deficiencies, is not in a crisis state today. This makes it very different from the situation prevailing in the security industry in the late 1960s, when the growth of transactions settled via paper instruments overwhelmed the system for managing custody and transfers, leading to the formation of DTCC, and the conversion of most securities to book entry form.[21]

Because of misaligned interests and lack of confidence in feasibility or sense of urgency, natural market forces are not leading to the pursuit of improvements in MBS collateral necessary to bring about fundamental change. In an industry with no shortage of challenges and resource demands, MBS collateral reform is easily put aside, and has been.

[20] The height of concern over the integrity of the foreclosure process was the "robo-signing" controversy in the aftermath of the Global Financial Crisis. The policy evolution toward limiting the use of foreclosure as a loss mitigation tool had taken root by that time, and gained force during the government response to the COVID-19 pandemic.

[21] Although half a century later the DTCC is faced with its own version of the "100% adoption" challenge, as it described in a 2020 white paper ("Advancing the Dematerialization of U.S. Securities"), which called for collaboration in the U.S. securities markets to discontinue the issuance of paper securities and convert existing paper securities to digital form. (MBS issuance is today entirely digital.)

Catalysts for Reform

That said, there are aspects of the MBS collateral management situation that are favorable for a well-conceived reform proposal.

- It is not inherently controversial. Project interviews strongly indicate a consensus that reform is needed, even overdue. Though a great deal of vetting is still required, interviewees unfailingly expressed sympathy with the reform concepts described in the previous section.
- Although it has not been possible to analyze as part of this project (because the relevant information is proprietary), there are economic advantages to reform. The legacy system, with its reliance on movement, storage and (mostly human) inspection of paper, is expensive. While no modernization project would be cost-free, for the servicers who pay the toll for the status quo the reforms discussed above are largely a matter of implementing new business arrangements that would be cost-effective on a lifetime basis for virtually every loan they applied to. Document custodians would be faced with some restructuring of their business model – but that eventuality is known today, and a successful reform effort would at least have the effect of providing greater definition for the road ahead.

> *"Though collateral management gives the appearance of being perpetually overlooked…conditions exist that would result in widespread support if a visible reform movement developed…"*

- The agencies would be required to re-examine and revise program policy, and re-tool some of their systems – but as mentioned above a reform effort carries advantages for them as well: greater knowledge about the status of their collateral (and less need for manual auditing). In addition, an exchange with clearinghouse capability could standardize many processes that are only partially automated today.
- Also referenced earlier is the fact that collateral management is an area where it would require only a limited number of market participants – given willingness to collaborate – to blaze a path of modernization that the industry as a whole would be motivated to follow.

Though collateral management gives the appearance of a being perpetually overlooked segment of mortgage finance, conditions exist that would result in widespread support if a visible reform movement developed along the lines discussed here.

Collective Action Reform Path

The surest path to broad-based reform in MBS collateral management would be for the agencies to lay out a unified vision for full digitalization, and make clear their determination to actualize the vision through program policy changes. This paper has discussed how (and speculated on why) this path has not already been taken.

An alternative path to reform could be driven by the originator/servicer segment of the market – the seller/servicer/issuers in the agency programs who are also the clients of the document custodians. It is this group that suffers the most from the legacy system inefficiencies, and within which a modest number of firms comprise a large share of the mortgage origination/servicing market.

"…collective action on the part of the originator/servicers could be the means of breaking through the present state of inertia in the MBS collateral management."

The prerequisite for a servicer-driven approach would be a working consensus on a reform concept and the desirability of expending effort to achieve it, as well as some level of confidence that other market participants – especially the agencies – could be induced to play the necessary roles in support.[22] But if these conditions are present, collective action on the part of the originator/servicers could be the means of breaking through the present state of inertia in MBS collateral management.

The concept of collective action already has currency within the larger world of security custody, where the term "mutualization" has been used to describe the possibility of joining forces to support a shared platform for performing functions where there is no benefit to reliance on dispersed, competing entities – that is, a form of collective action on the part of the custodial service providers. [23]

But here the focus is on collective action on the part of the originator/servicer clients, to restructure the legacy system to minimize physical and human-powered transactions and

[22] A key factor in gaining acquiescence from Fannie Mae and Freddie Mac would be the posture taken by their regulator, FHFA.
[23] https://flow.db.com/securities-services/a-new-dawn-for-custody

maximize digital functionality. To accomplish this, a consortium of industry leaders would seek to reorganize the technology and process architecture that the document custodians and the agencies currently utilize. In the reform vision described here, the restructuring would be oriented toward immobilizing the pNote, automating loan/pool certification, and re-engineering processes so that they contributed to and relied upon a centralized exchange of collateral data. The consortium would need to gather information to refine the future state concept, and translate it into market solicitations.

For this approach to gain broad-based support It would have to be clear who was sponsoring the market solicitations, and that there was sufficient market power behind the effort to make it a viable proposition. It would also have to be persuasive to the broader industry community that the proposed reforms made sense for the industry as a whole, and not just narrower interests of the consortium sponsors. Finally, there would have to be some evident willingness on the part of the agencies to move in the direction proposed in the reform vision, so market participants could be assured that adaption to it would be worthwhile.

Three possibilities for pursuing a collective approach, in ascending order of force, are discussed below.

- Working as an alliance, the sponsors could articulate the reform vision through the development of market solicitation materials, committing to operate under their terms as individual firms, and collectively to maintain their currency, but otherwise leaving adoption up to the market. This is the simplest approach but leaves the most room for the collective effort to dissipate without achieving its purpose. It might not be a strong enough approach for overseeing a mortgage collateral exchange, for example.
- The sponsors could create a formal, permanent organization to develop, propagate and maintain the new terms of business developed through the market solicitations and exchange, with the defined objective of driving full adoption and overseeing the development and administration of the exchange. MISMO and the American Land Title Association – both of which provide standard-setting services based on a representative committee and board structure, thus obviating the need for individual firms to fend for themselves in the subject areas – are examples of how this has been successful within housing finance.
- Under the above two approaches, firms would ultimately contract with the service providers individually. A third approach would be for the consortium to form a co-operative organization that would itself contract with the service providers on behalf of its members. This might be an effective way of tackling a paper custodial utility, or a collateral data exchange. It is the most powerful approach, though the effort needed to incorporate rules about anti-competitive practices might be considerable.

This is a high-level treatment of the collective action concept, more for the purpose of illustration than for advocating a specific path; there are many flavors of approach that could be considered.

But one way or another, the road to meaningful reform probably involves some form of the following:

- A future state vision, and defined path, that is articulated and backed by the leading servicers, that
- Is supported by trade groups, and that could be adopted by rank and file firms without disruption (which implies long lead times), and
- Is supported by the agencies, at least in the essential points where that is necessary (see Appendix Two).

First Steps: Institutional Backing and Advisory Group Support

The previous chapter referenced a prerequisite that would need to be met before active work could begin on developing market solicitations, or whatever other method is chosen for pursuing a restructuring of the legacy system. The prerequisite is a working consensus about pursuing reform, which ultimately could be expressed as a future state vision and commitment by industry leading firms to collaborate to bring it about.

If collective action on the part of the market-leading participants is the most likely engine of progress, a first step in achieving this prerequisite would be to undertake a review of the landscape with these firms, to gather their initial reaction and seek assent to continuing engagement, such as by serving on an advisory group. As a follow-on action, an advisory group with a defined membership (including representation from the different categories of industry stakeholder – servicers, document custodians, warehouse lenders) could be a vehicle for seeking continued input while steering toward a consensus reform vision. It could provide a governance structure for the initiative.

There are several other examples of early-stage work that could be done under the auspices of an advisory group that were not included in this research project in the belief that they would be better pursued when clearer institutional sponsorship had been obtained. These are:

- Exploration of the topic with the agencies

- Exploration of the topic with other Washington-based organizations that would have a significant interest: the Mortgage Bankers Association and its subsidiary MISMO, and MERS
- Construction of an economic case for reform, such as by examining the collateral management costs of a representative loan throughout its lifecycle, under the legacy system and a reformed system. Because this analysis would require the use of proprietary information, it has not been feasible to obtain the necessary information as part of this initial analysis.

If an early-stage effort commences under the guidance of an advisory group, some public communication should be made. Even when it is premature to advocate specific reforms or make commitments, the mere recognition of the need to improve the legacy system would be encouraging to the many participants who are affected by the low-automation current state. Most importantly, it would establish a hub for dialogue on the related topics – something that does not seem to exist at present. There is probably valuable thinking within industry on digitalization of collateral management that is not evident currently because of a lack of outlets in which it can be expressed. Providing a rallying point would be a low-cost effort and method of advancing a segment of housing finance that has for too long been treated as a backwater.[24]

A successful advisory group effort could lead into one of the more formal consortium-based approaches mentioned in the preceding chapter, aimed at implementation of an agreed-upon set of proposals. (Appendix Three contains additional thoughts about operationalizing MBS collateral reform.)

[24] One use of a higher-visibility forum for discussing collateral issues would be to foster consideration of harmonizing the agency program requirements. There should be fewer points of difference among the programs than there are today, since the basic purposes and risks are fundamentally the same.

CONCLUSION

Modernization of a system that involves disparate functions, locations, participants and overseers is inherently difficult. The digitalization of the residential mortgage industry is certainly an example. The journey toward a true digital mortgage system is well underway but seems at this point as if it could take decades more to achieve.

But MBS collateral management represents an intriguing subcomponent of this larger digitalization transition, one in which significant change could be achieved within the next decade if a consortium approach is deployed effectively. A decision to seek broad reform, possibly involving utility constructs, by a small group of market-leading companies could set a direction that can be advantageously followed by rank-and-file firms without significant investment in new technology at the firm level – development work by the consortium leaders could be easily leveraged, and the major technology innovation would be a cloud-based data exchange.

Reformed custodial practices (if supported by the agencies) could be expected to lead to clear cost savings compared to the current system of practices. This would require some restructuring of the business model historically used by document custodians – but that need is present and understood already; if proposals such as those described in this paper are fully adopted it will merely speed up an inevitable transition from paper to digital processing.

> *"…the successful automation of the formerly paper-based securities industry should serve as inspiration that something similar could be accomplished in…MBS collateral management if the industry takes a unified approach."*

A centralized data exchange would vastly improve stakeholder knowledge of the status and location of MBS collateral, and could serve as a foundation for automation of critical aspects of warehouse lending – and it might also prove to have application beyond what is contemplated here. It is not a radical concept, having been advanced in some detail, and multiple forms, by Congress in the decade following the Global Financial Crisis.

The key to unlocking these possibilities is adapting collective action approaches that have worked in similar areas in the past to this immediate field, which suffers from its image as an esoteric back-office function that is a captive of agency requirements.

This paper has provided background and discussion of the field of MBS collateral management, and suggested some areas that seem worthy of further exploration – and there are no doubt others. It seems worthwhile for practitioners to convene on the subject and explore whether collaborative approaches to modernization make sense.

Two alternatives to pursuing a reform program along the lines presented here come to mind:

- Do nothing collectively and let matters take their natural course
- Focus all efforts on increasing the rate of eNote origination to 100%

The problem with the first alternative is the high opportunity costs – the avoidable expenditures of large quantities of time and money that the legacy system necessitates. The problem with the second is two-fold: the difficulty of driving this change at the ground level of the borrower/closing agent/mortgage lender, and the fact that multiple interviewees indicated that the current eNote regime needs additional engineering before proceeding to higher levels of usage.

It may seem like MBS collateral management reform would be a lot to take on at a time when there is no shortage of technology implementation challenges to confront in housing finance – but, to conclude at the starting point, the successful automation of the formerly paper-based securities industry should serve as inspiration that something similar could be accomplished in the subordinate world of MBS collateral management, with similar payoffs, if the industry takes a unified approach to the endeavor.

APPENDIX ONE: Elaboration on Reform Opportunities

Immobilization of Paper

- Objective: confine the need to handle the pNote (and any other paper documents subject to third party custody) so that to the extent possible it ends with the digitization of the document shortly after receipt by the custodian.
- Standard document custody agreements should contain boilerplate language that provides for the transfer of a document custodian's responsibilities from one client to another, at the option of the client in connection with an MSR sale.
    - This would need to be accepted as a standard business practice by the agencies, and supported through collective action drive widespread reform.
    - It would require greater attention to standardization of the terms and requirements of paper custody, since responsibilities would be transferrable.
    - It would still be possible for a servicer to change document custodians, at its option, but this should be much a rarer event than the transaction-driven transfers that are common today.
- If paper documents were not moved as the result of a transaction, recertification should not be required.
    - Both Fannie Mae and Freddie Mac have streamlined requirements for these situations, which should be harmonized. Some of the streamlined requirements would be good candidates for automation so that they could be performed in a standardized fashion, possibly via a data exchange (see "Centralization of Information").
    - Ginnie Mae requires a recertification involving numerous reverification steps for any transfer of servicing - even when the custodian is not changing. It is not clear why this should be necessary, if the documents were already certified and have not since been moved.
- Upon receipt by the document custodian, pNotes should be imaged and converted to structured data according to a standardized method. (Ideally the image would be made by the closing agent. But it would be harder to standardize at that level, since there are thousands of closing agents.)
    - Currently, many documents are imaged. But the testimony of the interviewees is that the process is inconsistent – it may or may not occur, and when it does it might occur in different locations, and the technology utilized might differ.
    - The standardized method advocated could be seen as roughly analogous to the standard established by MISMO for the eNote (SMART Doc®) – just as all eNotes conform to the format standard established (and periodically updated) by an

authoritative third party for whom that is a core purpose, all electronic image/data sets created by the paper custodian from the pNote would confirm to a third party standard, so that all users of the image/data would be assured of interoperability.

- The result would be to create a digitized version of the authoritative paper version that, upon certification, would (ideally) be considered to have equivalent standing to an eNote – the certifying agent, acting in a fiduciary capacity, would have validated that the newly-created electronic record accurately reflected the information contained on the pNote, and could therefore be relied upon for all purposes from that point on.
- The creation of a validated electronic version of a note (as distinct from a true eNote) would set the stage for integration of the two hybrid system channels (pNotes and eNotes), in that systems could be devised that would work with a data set that was consistent for every loan regardless of what form the original note was in. This would facilitate (but also require) the data exchange discussed in "Centralization of Information."

- This reform proposal considers paper storage/digitization a discrete specialized function, not needing to be bundled with loan/pool certification (as it always is today).[25] As discussed further below, loan/pool certification could be performed by a certification agent that is different from the pCustodian.

Some aspects of this (narrower) pCustodian function give it a utility-like flavor:

- Warehousing paper mortgage documents is a slow-growth transitioning to negative-growth business, where the cost structure is heavily dependent on scale. It makes increasingly less sense for an industry having this profile to be conducted by as many entities/locations as are agency-approved and active in it today.
- As envisioned in this reform proposal, the pCustodian(s) would have increased responsibilities to unaffiliated entities whose work follows behind the upfront paper processing. For example, in cases where issues concerning a note are not able to be addressed via the stored image, the pCustodian must stand ready to support inquiries from the certification agent (if it is a different entity), servicer, court official, or any other party with a legitimate need.

[25] The reference to "loan/pool" certification reflects the fact that Fannie Mae and Freddie Mac certify that an individual loan has met their standards, while under the Ginnie Mae program it is the pool of loans that is certified.

Automation of Certification

- Objective: Use advanced technology to analyze and certify the imaged documents automatically, reserving the use of human intervention for isolated cases where it is a necessary backup.
- Once a pNote has been converted to an image and structured data, certification could be performed by either the pCustodian or a separate entity that is focused on that particular function.
    - It seems likely that the agencies would continue to require that the certification agent be a fiduciary – especially if an enhanced purpose of certification would be assuring downstream users of the note (such as those involved in foreclosure proceedings) that a digitized version of a pNote can be relied upon.
    - Some issues might arise in the certification process that could not be satisfactorily resolved through automated processes. These would be referred to human reviewers, and might need to involve the pCustodian that holds the original pNote (hence its utility-like role – it must stand ready to support any firms authorized as certification agents). This human processing of auto-certification "kick-outs" occurs today under the Fannie Mae and Freddie Mac self-administered auto-certification functions.
- As the characteristics of the pCustodian business (such as high fixed costs) argue for competition between a small number of participants who can operate at scale, so the characteristics of the certification agent business argue for competition between any number of interested parties who could meet the agency fiduciary test and see themselves as suited to a business that will require continuing investment in technology to improve the speed and accuracy of evaluating digitized documents.
    - Certification agents would be on the front line of mastering advanced technologies (such as AI) to unlock and analyze, more efficiently than a human can, the information embedded in a pNote – without needing to physically handle the note after the image is created. In this sense auto-certification can be understood as a means of limiting the opportunity costs of a regrettably long period of transition to the digital mortgage – it remedies the failure to create digital instruments during loan origination through the application of powerful technology to create a validated digital record within a matter of days after. This is conceivable because the ability to foster auto-certification is in the hands of a relatively small number of actors (as opposed to the much greater number of determinants of whether an eMortgage is created).
- Whereas today the act of certification is treated as being of value only to the agency, and at the point of a loan being approved for sale/securitization, the creation of a digital record of

this validation step could have value elsewhere in the process chain through the distributing mechanism of a broadly accessible system of record (see “Centralization of Information”).

Centralization of Information

- Objective: create a centralized data exchange of MBS collateral information, to provide a single source of timely data for system participants, and serve as a foundation for process automation.
    - Identifying the loan information that could be needed by others and moving it into a central repository as quickly as possible establishes a foundation for numerous downstream efficiencies that are not possible today because of reliance on bilateral-only information flows.
    - The basic functional outline would look like this (see also Figure 3 below):
        - A loan record is created in the exchange either at the point of origination or when an intermediary (warehouse lender or custodian) takes possession of the note.
        - The loan record provides the form (i.e., paper or electronic) and location of the note and security instrument.
        - An image of the documents is added to the record as soon as it is created.
        - A notation is made by the warehouse lender to reflect its interest in the note as its security for funding the loan. (If this notation is made in the exchange as a condition of the funding of the loan by the warehouse lender, and the warehouse lender has access to the image of the note made by the document custodian, or even better the closing agent, would there be any need for the warehouse lender to take possession of the note?)
        - The record contains the status of certification (e.g. not started, started not certified, deficiency not rectified, certified) – changing the certification status to “certified” would clear the loan for funding/swap by the GSE or pooling via Ginnie Mae.
        - For conventional loan notes held by a document custodian or warehouse lender, a directive from the originator to send the note to a GSE, with commitment and other information would be sent through the exchange. Funding instructions would be stored, and funding would take place through the clearinghouse function of the exchange.

    - The warehouse lender (upon receipt of funding from the GSE, or receipt of the security by the security custodian) would indicate the release of its interest in the collateral note. (It could be considered whether the exchange should be used to further transmit net proceeds from the warehouse lender to the originator.)
    - Changes to any of the information maintained in the exchange would be recorded over the life of the loan (including the change of location of documents that are released, such as in connection with the foreclosure proceedings).
  - Some of these functional steps have elements of "smart contracts" – automated actions between two parties scripted to fulfill contract terms. The prime example is a loan being automatically cleared for GSE funding once a document custodian has changed a loan record to reflect that it has been certified. Smart contracts are associated with the use of blockchain, which raises the possibility of that technology playing a role in this reform opportunity, something that could be considered in a subsequent phase.
    - One attribute of a centralized exchange is that it would allow for common management, such as via smart contracts, of MBS collateral regardless of whether it is located within the separate pNote and eNote systems. This is one means of solving problems such as warehouse lender frustration over the eNote program infrastructure, which is regarded as not properly supporting their security interest in the note.
- Implementing a centralized data exchange concept would require sorting out the roles of four technology platforms that are central to collateral management currently, and determining how best to ensure they work together as needed, and that new technology is created to capture the possibilities that are foregone in today's conglomeration of processes.
  - Foremost among these is MERS, because MERS (through its two systems of record) already maintains an electronic registry of information that is naturally related to the collateral exchange data (namely, the owner/holder/controller/location of the promissory note and the owner of the mortgage servicing rights, or the identity of the primary servicer). At a minimum, consideration would need to be given to how the exchange would coordinate with MERS. However, in a larger sense the centralized collateral exchange could be looked at as a logical extension of what MERS already does.[26]

[26] Two interviewees with long experience commented that MERS was originally conceived to have application to a broader set of functions than it does now – including automation of warehouse lending. No public information on that turned up during this research project.

  - Another prominent legacy platform operating in this sphere is emBTRUST (owned by SitusAMC), which supports custodian workflow and has dominant market share in the custody industry.[27]
  - The other two legacy platforms are the proprietary systems used by Fannie Mae and Freddie Mac to manage their interaction with document custodians.[28] These systems presumably serve these agencies' perceived needs reasonably well, even though without contributing very much to broader efficiencies.
  - One challenge of implementing a centralized data exchange would be coordinating information flows involving these platforms. emBTRUST and the Fannie Mae/Freddie Mac systems do not talk to each other even though the agency platforms are the ultimate recipients of work performed within emBTRUST. Also, MERS has limitations on how the information for which it is the repository can be used. To achieve maximum functionality, an exchange would need to contain information that also resides in these legacy platforms.
- The legacy system is marked by inadequate assurance for the agencies about the location of collateral, which they address though cumbersome ongoing maintenance requirements.
  - Agencies require document custodians to complete inventories of documents, which are manually submitted and reviewed against agency records (or, in the case of Ginnie Mae, against issuer-provided records). Here are examples:
    - Freddie Mac: "Document Custodians must create reports that list by Freddie Mac loan and Servicer name each Note that they hold, including Notes that have been released to Servicers, as of the end of each calendar quarter. Freddie Mac will send a request for each report, which is due by the date indicated in the request in Excel spreadsheet format to loan_delivery_funding_ops@freddiemac.com. These reports enable Freddie Mac to reconcile our records with yours."
    - Ginnie Mae: "At least annually, the document custodian must perform an inventory of all pools held for each Issuer. At a minimum, the following procedures must be performed: The pool numbers on the Issuer Custodial Register must be reconciled to a current Issuer-provided listing of pools; and the pool numbers on the Issuer Custodial Register must be reconciled to the Pool Master Files." This seems intended to determine whether the custodian and the issue agree on what pools the custodian is responsible for, and whether its records are in order.

[27] SitusAMC estimates emBTRUST's custodial records market share at 85%.
[28] Fannie Mae's Document Custodian and Freddie Mac's Loan Selling Advisor.

        - Fannie Mae: "In its sole discretion, Fannie Mae may require a Document Custodian to complete an inventory of required documents." Also: "The servicer must provide to the document custodian an electronic list that identifies, by Fannie Mae loan number, the loans serviced by the servicer for which the document custodian holds custodial documents within 30 days of such a request from the document custodian."
    - These requirements are slightly varying attempts to deal with the fact that competing records of custodian inventory are kept by different parties, and these records get out of sync. **They reflect the lack of a true collateral system of record.**
    - A centralized exchange would be the system of record for all parties, who could pull information from it as needed. Going a step further, with a well-functioning exchange, it might be that the agencies would not even need to maintain their own separate inventory records. This would eliminate the need for scores of custodian/agency specific manual reconciliation projects.
        - In a reformed system, the paper custody function would be streamlined compared to today, with fewer locations and far less movement of paper. There could be a single annual system-wide integrity audit project, conducted by a third party, that would compare the physical inventory of the paper custodians and eVaults against the system of record. This audit would be available to all users of the exchange.
    - Similarly, the agencies require document custodians to provide reports on documents that remain released (for reasons other than liquidation) longer than a specified number of days (90 or 180). These reports are also reviewed and followed up on by manual processes. With a centralized exchange, information about aged releases could be pulled by the agencies at any time, without the involvement of the document custodians.
    - Ginnie Mae does not itself have any loan level records about the collateral underlying its pools. Its connection to ongoing inventory location is the annual manual submission by document custodians of form 11715, to which is appended lists for all the pools for which a given custodian is responsible. For it to obtain loan level information would require complex data matching analysis against other databases. A centralized collateral exchange would provide Ginnie Mae with valuable, real-time loan level information about its collateral that for all practical purposes it does not have today.[29]

[29] A consequence of Ginnie Mae not having this information is that it can address certification issues only at the pool level – it manages what is basically a risk management function without any knowledge of the actual loan level document deficiencies that are the true source of the risk.

- Fully incorporating the automation of warehouse lending would add the management of funds to the management of information – the exchange would have a clearinghouse component, which would require that banking services be added to the technology platform services. This would be a significant undertaking, and is worth far more examination than it can be given here. But the MBS arena has the characteristics that make clearinghouses effective in other domains – multiple payers and payees, having different profiles, and large volumes of transactions every day needing to be verified and executed. Furthermore, the key element in most of these transactions is control of the note, which is the focus of the collateral management system as a whole. It makes sense to explore the development of a clearinghouse function in connection with a mortgage collateral data exchange.
- A question for exploration is whether a collateral data exchange would need to contain Personally Identifiable Information (PII) – or, perhaps more accurately, how the information it would need to incorporate would be managed to ensure compliance with the regulations that safeguard PII. But fundamentally, the point of the exchange would be to serve as the repository for information about security collateral in the form of loan instruments, the index of which is a loan number (ideally the MERS MIN) – not information about loan borrowers. PII does not seem to be central to this purpose, but legal counsel would need to explore the issue.

APPENDIX TWO: Elaboration on Agency Program Support

- Basic Issue: Any meaningful program of reform would have to be supported by the agencies, whose program requirements shape mortgage collateral management. Even just awareness of the extent to which this is so impacts the motivation to pursue innovation, according to some interviewees. This Appendix identifies the main areas where agency support is necessary, and assesses how the issues might look from the agency vantage point.
- First and foremost in agency consideration of proposed reforms would be that the reforms strengthen, or at least not weaken, the essential risk mitigation objective of their collateral management requirements – that the loan documents protect the ability of a servicer to enforce the terms of the note and security instrument. (In the Ginnie Mae program, where program responsibilities are more dispersed than under the GSE programs, there is the related consideration that the loan documents facilitate reimbursement of the servicer by the insuring or guaranteeing agency.)
- A second consideration for the agencies would be simply the effort needed to evaluate or adapt their existing processes to a new system, and the rationale for it – do proposed reforms represent an improvement from their standpoint, or just an alternative? What level of investment would be required to support the program policy and operational aspects of a reform program? How widespread is the backing for reform, and are overseeing agencies (FHFA in the case of Fannie Mae and Freddie Mac, and HUD in the case of Ginnie Mae) supportive?
- Program policy considerations:
    - *Client-driven assignment of custodial responsibilities*. The purpose of this reform is to eliminate the need for physical transfer of loan files in the event of an asset sale to a firm that uses a different custodian. In theory, movement represents a risk to the agencies as well (which is why all the agencies require transit insurance under certain circumstances), and its minimization would be an improvement – the files would simply stay in the hands of an approved custodian even when loan or MSR ownership changed. The agencies would continue to approve the asset transfer itself, just without a corresponding document custodian transfer.
    - *Streamlined re-certification procedures*. This is important because the client-driven transfers of custodial responsibility reform described above would greatly increase the situations where these policies are relevant.
        - Fannie Mae and Freddie Mac already have streamlined re-certification procedures for transfers with no change of custodian – basically, making sure the assignment chain is in order and transmitting notice of recertification to

the agency (the latter step involving a manual process that could be better executed through a collateral data exchange).

- The key program policy issue here involves Ginnie Mae, which appears to differ from the GSEs in not recognizing the distinction between an asset transfer involving a different custodian and one where the custodian is unchanged. If this is correct, it would frustrate the "immobilization" reform by calling for pNotes to be retrieved and re-examined even when they are not being moved to another location. This issue should be discussed with Ginnie Mae (along with other points of distinction with the GSEs that impact the ability to implement standards that are uniform across all the agencies – an example being Ginnie Mae's requirement that recorded deeds of trust be held by a document custodian, counter to GSE requirements).

- *Auto-certification*. The agency document custody requirements do not prohibit automated certification per se (as noted, the GSEs auto-certify eNotes themselves), though with Ginnie Mae in particular the wording in many places implies that manual human processing is envisioned. Theoretically, the question as to whether automated certification procedures can appropriately be used would be up to the judgement of the fiduciary custodian. But it is an area where there should be collaboration, to ensure that all parties are comfortable with the increased use of technological methods.[30]

- Operational considerations:
  - If the management of MBS collateral is being improved by greater use of shared platforms (such as emBTRUST, or a data exchange) outside of the agencies, will Fannie Mae and Freddie Mac adapt their proprietary systems so that they interact with the shared platforms? This would require that the GSEs re-tool how they receive information – but with the benefit that the platforms will make the information more accurate and timely, and standardize the information so it can be processed with fewer resources.
  - Ginnie Mae is in a different position – its lack of a proprietary system comparable to that of the GSEs, or any infrastructure allowing it to monitor and manage its loan-level collateral situation – renders it something of a "greenfield" opportunity. The reform approach to Ginnie Mae could therefore be based on collaboration to ensure that a reform program such as is contemplate here can serve the agency's needs, and demonstrate that it would not be a good use of resources for Ginnie Mae to

[30] A representative of a large document custodian stated during a project interview the belief that Ginnie Mae does not allow auto-certification (though this is not apparent from Ginnie Mae's guidelines).

build its own version of the GSE proprietary systems, further diffusing the legacy system.

- Finally, there is a side benefit for the agencies in a reform program that requires ongoing industry collaboration to execute, in that a collective action vehicle formed to pursue reform could also serve as a forum for surfacing general collateral management issues and opportunities that are currently neglected.

APPENDIX THREE: Elaboration on Actualizing Reform

- First steps in an initiative would be establishing the prerequisite of a working consensus about pursuing collateral management reform through the market leading originator/servicers. This could lead to formation of an advisory group, to provide institutional sponsorship for the effort.
    - The suggestion of an “advisory group” (as opposed to “working group,” for example) is used here for two reasons, both of which have to do with making it desirable for a firm to participate in the group effort.
        - One is that it implies that the group is supporting a defined initiative, for which it is to provide a measure of governance (whereas a working group might be more for the purpose of tackling a problem, without it being clear what the effort might lead to).
        - Another is that serving as an advisor is a more limited concept – it implies that an advisor will be providing input and suggestions about a body of work that others are responsible for developing and proffering for comment. (If advisors wanted to be deeply engaged, so much the better, but main objective should be to prevent concerns about resource management from inhibiting participation by firms that should be involved.)
- Section Three suggested that some public communication be made about an initiative to be overseen by an advisory group. As stated, one purpose of the communication would be to provide a rallying point for anyone who has an interest in the topic. Another, however, is to define the area of collateral management modernization as a distinct, worthwhile field – reflecting the tendency of eMortgages or other front-end digitalization topics to dominate the discourse. A public communication could simply summarize the current state of MBS collateral management, suggest in very general terms what a future state that takes better advantage of the possibilities of technology could look like, and announce that an advisory group-led effort to explore a reform campaign is underway.
    - A public communication could also mention the allusions to this subject in the HFR proposals, making clear that that a new effort would be simply returning to something that was previously on the policymaking agenda.
- In addition to developing the main components of a reform program, an advisory group-led effort could explore the relation of MBS collateral management reform to other digitalization topics, such as:

- The long-term role and management of the larger set of loan data created in the origination process, or over the life of the serviced loan. The mortgage data exchange contemplated here serves the limited purpose of system-of-record for collateral information. Others have suggested mortgage data exchanges that operate on a larger scale, and serve a wider range of customers.
  - Notwithstanding the contention in this paper that the pace of eMortgage growth is too slow for the digitalization of mortgage collateral management to dependent on it…it is essential that eMortgages eventually take over. Are there ways a collateral management reform effort could support eMortgage growth – without waiting for it?
- If an advisory group effort can succeed in establishing a working consensus about a reform vision, the initiative could shift to a more formal, consortium-based approach. Three main areas would need to be addressed in this stage:
  - Re-structuring of the roles and responsibilities currently performed by document custodians, and the contractual expression of them in service agreements.
  - Defining the functions of a collateral exchange/clearinghouse, deciding on a governance structure, and procuring the services needed to develop and operate it.
  - Collaborating with the agencies to ensure that program policy supports the reform vision (as described in Appendix Two)
  - Implied in the above are determinations about what permanent form a consortium should take, and how its work should be funded.
- Many interviewees stated the importance of building on established industry groups and structures, and considering precedents, when constructing a reform program. Challenges would abound, but there are many examples of previous successes that can be referenced or built upon.