REDACTED

Federal Housing Finance Agency
Office of Inspector General

Despite FHFA's Recognition of Significant Risks Associated with Fannie Mae's and Freddie Mac's High-Risk Models, its Examination of Those Models Over a Six Year Period Has Been Neither Rigorous nor Timely

This report contains redactions of information that is privileged or confidential.

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Executive Summary

The Housing and Economic Recovery Act of 2008 (HERA) created and charged the Federal Housing Finance Agency (FHFA or the Agency) with, among other things, the supervision of Fannie Mae and Freddie Mac (together, the Enterprises) the Federal Home Loan Banks (FHLBanks) (collectively, the regulated entities), and the FHLBanks' fiscal agent, the Office of Finance. Its statutory mission as a federal financial regulator includes ensuring the safety and soundness of its regulated entities. For the Enterprises, FHFA fulfills this statutory obligation through its Division of Enterprise Regulation (DER), which conducts targeted examinations and ongoing monitoring of the Enterprises during each year. Since 2008, FHFA has also served as conservator of the Enterprises.

The Enterprises rely heavily on models to measure and monitor risk exposures and make business decisions, and use them extensively for, among other things, mortgage underwriting, collateral valuation, home price forecasting, mortgage cash flow analysis, financial reporting, risk management, risk measurement, stress testing, portfolio management, hedging, financial instrument valuation, measuring compliance with internal risk limits, and capital reserves measurement.

FHFA has long recognized the importance of evaluating high-risk models through its supervisory authorities. In March 2013, FHFA adopted a Risk Modeling examination module and work program that were developed by FHFA's supervision policy group and formally approved for use by FHFA examiners beginning with the 2014 examination cycle. The module explains that "[t]he overarching goal of a risk modeling examination is to verify independently the model results produced by the [Enterprises] so that the FHFA can have confidence that the [Enterprises] identify, measure, and manage risks appropriately." Notwithstanding FHFA's adoption of this Risk Modeling examination module and work program and clear direction to follow this module and work program, DER did not require its examiners to use either one. Moreover, DER did not adopt its own risk modeling examination module or work program nor did it provide its examiners with clear guidance on model risk examinations.

We performed this evaluation to assess FHFA's supervisory oversight of the Enterprises' model risk management.

The FHFA Director has advised that FHFA's examination work must be "consistently rigorous, timely, and effective." We sought to determine the examiner resources dedicated to conduct targeted examinations of the Enterprises' high-risk models and the number of such examinations completed during 2014 through 2019 (Review Period). Based on our review of DER workpapers, DER assigned an average of six model examiners to conduct targeted examinations of high-risk models each examination cycle from 2014 through 2019. We determined that DER completed a total of 21 targeted examinations of high-risk models during that period, many of which were not completed during the examination cycle for which they were planned.

We also sought to determine the supervisory coverage for the 120 models classified as high risk by the Enterprises during the Review Period. We found that DER examined a total of 24 high-risk models (20% coverage) through targeted examinations, which FHFA considers to be "a deep or comprehensive assessment" of areas of high importance or risk. The vast majority of these 120 high-risk models received no direct supervisory review through targeted examinations. The relatively small number of planned targeted examinations and low rate of completion during the planned examination cycle cannot reasonably be viewed as "consistently rigorous, timely, and effective" as expected by the FHFA Director.

According to DER, budgetary constraints purportedly limited its ability to conduct a larger number of targeted examinations of high-risk models. DER was recently authorized to add 10 new positions. However, it did not seek to add additional model examiners to its onsite examination teams. Thus, DER's capacity to examine the Enterprises' high-risk models remains unchanged. DER officials maintained that the prior FHFA Director kept DER's budget flat for fiscal years 2015 through 2019. The determination, either by DER or former FHFA leadership, to fail to establish a budget adequate to fund FHFA's effective supervision of the Enterprises, is inconsistent with Congress' intent, as set forth in HERA. FHFA is not an appropriated agency. HERA vests the FHFA Director with the authority to assess FHFA's regulated entities for the full cost of supervising them to ensure that they operate in a safe and sound manner.

In a recent audit on workforce planning, we concluded that DER's failure to adopt and implement a systematic workforce planning process and its persistent failure to complete targeted examinations in the cycle for which they were planned called into question DER's supervisory capacity. The performance data with respect to completion of high-risk model examinations reflects the same concerns. To the best of our knowledge, no systematic workforce planning process has been conducted for model risk. FHFA's failure to complete most targeted examinations of high-risk models during the examination cycle for which they were planned demonstrates the impact of the lack of workforce planning in three related areas: qualifications for model

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examiners; number of model examiners; and number of high-risk models to examine annually in targeted exams.

We made two recommendations to address the shortcomings our evaluation identified. In a written management response, FHFA deferred any response to our recommendations until June 30, 2020, to provide its new management team in DER with the opportunity to consider them.

This report was prepared by Jacob Kennedy, Senior Investigative Evaluator, and Philip Noyovitz, Investigative Evaluator, with the assistance of Angela Choy, Assistant Inspector General for Evaluations. We appreciate the cooperation of FHFA staff, as well as the assistance of all those who contributed to the preparation of this report.

This report has been distributed to Congress, the Office of Management and Budget, and others and will be posted on our website, www.fhfaoig.gov, and www.oversight.gov.

Kyle D. Roberts, Deputy Inspector General for Evaluations /s/

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ABBREVIATIONS

AB	Advisory Bulletin
DER	Division of Enterprise Regulation
EIC	Examiner-in-Charge
Enterprises	Fannie Mae and Freddie Mac
ERM	Enterprise Risk Management
FHFA or Agency	Federal Housing Finance Agency
FHLBanks	Federal Home Loan Banks
HERA	Housing and Economic Recovery Act of 2008
MBS	Mortgage-backed securities
MRA	Matter Requiring Attention
OIG	Federal Housing Finance Agency Office of Inspector General
PMOS	Prudential Management and Operations Standards
Review Period	2014 through 2019

BACKGROUND...

Models Are Critical to the Enterprises' Business and Present Significant Risk Management Challenges

The Enterprises perform an important role in the nation's housing finance system by providing liquidity, stability, and affordability to the mortgage market. Among other things, each Enterprise purchases mortgages from mortgage companies, commercial banks, and other financial institutions and either holds these mortgages in its portfolio or packages them into mortgage-backed securities (MBS). Together, they support over $5 trillion in mortgage loans and guarantees. The Enterprises primarily generate revenue from guarantee fees on mortgage pools that back Enterprise MBS held by consolidated trusts and from the interest income earned on the assets in the Enterprises' retained mortgage portfolios less the interest expense paid on the debt that funds those assets. In 2018, the Enterprises reported combined annual net income of over $25 billion.

Enterprises' Use of Models

FHFA's advisory bulletin on *Model Risk Management Guidance* (AB 2013-07) defines a model as "a quantitative methodology or approach using statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates."[1] FHFA defines the "model universe" to include "core models, model-based applications and software, modeling processes, and significant end-user computing tools." In AB 2013-07, FHFA recognizes that its regulated entities "**use models in a variety of areas**" and that such use is often "**essential**." (emphasis added)

The Enterprises rely heavily on models to measure and monitor risk exposures and make business decisions, and use them extensively for, among other things, mortgage underwriting, collateral valuation, home price forecasting, mortgage cash flow analysis, financial reporting, risk management, risk measurement, stress testing, portfolio management, hedging, financial instrument valuation, measuring compliance with internal risk limits, and capital reserves measurement.

Models are subject to change to reflect, for example, refinements in the underlying quantitative methodology and algorithms, changes in credit underwriting policy and

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[1] AB 2013-07 cites to the Office of the Comptroller of the Currency guidance, OCC Bulletin 2011-12, for this definition as "current regulatory guidance." FHFA adopted a slightly modified version of this definition in its January 2020 examination guidance on Model Risk Management. That definition defines a model as "a quantitative method, system, or approach that applies statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates."

requirements, revised assumptions about trends in house price appreciation and future market conditions, the availability of recent loan performance or other pertinent data, and to address shifts in regulatory guidance. Depending on the circumstances and the nature of the change, model developers may make adjustments to existing models or create new versions of existing models, or they may create entirely new models.[2] As an example, one of Fannie Mae's high-risk models has undergone a version change each of the past six years and Freddie Mac's comparable model has undergone four version changes during that period.

The Enterprises classify models by the degree of risk associated with them: Fannie Mae designates its highest risk models as "high risk" and Freddie Mac designates its highest risk models as "very high risk" or "high risk." For purposes of this evaluation, we refer collectively to the models classified as high risk and very high risk by the Enterprises as "high-risk models." As of the first quarter of 2019, the Enterprises classified a total of 120 (out of 420) models as containing the highest risk: 97 for Fannie Mae and 23 for Freddie Mac.[3]

Enterprise Acknowledgement of the Risks Associated with Model Use

The Enterprises acknowledge in their public disclosures that their models carry risks. Freddie Mac, in its 2019 10-K, advised: "We face risks and uncertainties associated with the models that we use to inform business and risk management decisions and for financial accounting and reporting purposes."[4] According to Freddie Mac:

> We risk making poor business decisions in situations where we rely on models to provide key information. Our use of models could affect decisions concerning the purchase, sale, and securitization, and credit risk transfer of loans . . . [and] also

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[2] As an example, our white paper *The Current Expected Credit Loss (CECL) Methodology and the Enterprises and FHLBanks* (Sept. 24, 2019) (WPR-2019-004), at pages 8-9, describes the Enterprises' efforts to adapt an existing model and create a new model in order to implement a new accounting standard established by the Financial Accounting Standards Board. *See also* Fannie Mae, *2019 Annual Report* (Form 10-K), at 39 (explaining the need to adjust models and their updates when assumptions and data inputs change).

[3] The inventory of high-risk models reported by the Enterprises in 2017 and 2018 was similar to the numbers reported in 2019. In its March 6, 2020, technical comments to a draft of this report, DER claimed that the number of high-risk models at Fannie Me should be 76, not 97, because it maintained that Fannie Mae only had 76 active models registered in the model inventory rather than 97 active and development models. DER did not support its claim by reference to any supervision policy that excludes models in development from examination nor had DER officials made such a distinction during the field work for this evaluation. Because Fannie Mae has identified 97 high-risk models in its model inventory, and DER previously did not differentiate between active and development models, we have used Fannie Mae's identification of 97 high-risk models for this evaluation. We note that there would be no meaningful difference in our analysis, had the lower number of high-risk models been used.

[4] Freddie Mac, *2019 Annual Report (Form 10-K)*, at 149.

> affects our quality-control sampling strategies for loans in our single-family credit guarantee portfolio and potential settlements with our counterparties.[5]

In its 2019 10-K, Fannie Mae acknowledged that models are "imperfect predictors of actual results because they are based on historical data and assumptions regarding factors such as future loan demand, borrower behavior, creditworthiness and home price trends" and drew attention to attendant model risk management challenges. For example, when market conditions change quickly and in unforeseen ways, there is an increased risk that model algorithms, assumptions, and data inputs are not representative of actual market conditions. According to Fannie Mae:

> If our models fail to produce reliable results on an ongoing basis, we may not make appropriate risk management decisions, including decisions affecting loan purchases, management of credit losses, guaranty fee pricing, and asset and liability management. Any of these decisions could adversely affect our business, results of operations, liquidity, net worth and financial condition. Furthermore, strategies we employ to manage and govern the risks associated with our use of models may not be effective or fully reliable.[6]

FHFA's Recognition of the Significant Risks from Models and Instruction to the Enterprises to Mitigate These Risks

Since its inception, FHFA has recognized the risks from use of the Enterprises' high-risk models. In its first annual report to Congress after placing the Enterprises in conservatorship, FHFA drew public attention to the dire financial consequences that resulted from flawed credit models. FHFA reported that at the start of 2008, many of the Enterprises' credit risk models "substantially under-predicted credit losses" and "improvements came too late, after hundreds of billions of dollars in risky loans had already been acquired or guaranteed."[7]

In AB 2013-07, FHFA acknowledged that models used by its regulated entities carry risk, including the risks of data quality, sample sizes, and timeliness of data as well as "inadequate controls over model use." According to FHFA, reliance on inaccurate or inappropriate models may lead to "incorrect business decisions, ineffective management of risk, suboptimal levels of capital and loss reserves, and inadequate or inaccurate financial reporting."

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[5] Freddie Mac *2019 Annual Report (Form 10-K)*, at 149.

[6] Fannie Mae, *2019 Annual Report (Form 10-K)*, at 40.

[7] FHFA, *2008 Annual Report to Congress (Revised)*, at 36 (May 18, 2009).

FHFA's Prudential Management and Operations Standards (PMOS) communicate FHFA's expectations for minimum risk management practices by the regulated entities, including management of risk from models. PMOS Standard 8, Principle 10 directs: "A regulated entity should ensure that it has sufficient controls around risk measurement models to ensure the completeness, accuracy, and timeliness of risk information."[8]

Pursuant to AB 2013-07 and Principle 10 of PMOS Standard 8, management of each regulated entity is expected to implement policies that cover all aspects of model risk management, including assessment of model risk; acceptable practices for model development, testing, and implementation; appropriate validation activities; and oversight and controls over the model risk management process.

The Enterprises' Three Lines of Defense to Manage Model Risk

Enterprise development of models involves research, construction, testing, and validation and implementation. The Enterprises rely on a three lines-of-defense framework to identify, assess, manage, and report model risk to align with the requirements and expectations of AB 2013-07 and Principle 10 of PMOS Standard 8. The first line of defense consists of the business unit that directly manages the risk, which includes model owners, developers, users, and implementers. The business units have the primary responsibility for identifying, managing, mitigating, and reporting the unit's model risk.

The second line of defense consists of model risk management teams within the Enterprise Risk Management function (ERM). ERM adopts policy and exercises oversight of the business unit's adherence to policy.[9] The third line of defense is internal audit, which provides independent conclusions on model risk management.

As part of their corporate governance frameworks, the Enterprises maintain management-level committees that are responsible for overseeing model risk. Generally, the management-level committee, comprised of first and second line management and chaired by the second line, reports to an Enterprise-level risk committee or Enterprise Risk Officer, that then reports up to the Board of Directors.

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[8] 12 C.F.R. Part 1236, Appendix to Part 1236, 77 Fed. Reg. 33950, 33960 (June 8, 2012). *See also* FHFA's regulation on Responsibilities of Boards of Directors, Corporate Practices and Corporate Governance Matters directs that the board of directors of each Enterprise approve Enterprise-wide risk management programs that address, among other things, operational risk. 12 C.F.R. § 1239.11(a)(1). Model risk is a subset of operational risk.

[9] At Freddie Mac, the Enterprise Model Risk team within ERM performs the second line of defense function. At Fannie Mae, its Model Risk Management group performs the second line of defense function.

FHFA Has Long Recognized the Importance of Evaluating High-Risk Models Through its Supervisory Authorities but DER Examiners Were Not Required to Follow FHFA's Guidance on Model Examinations and DER Did Not Promulgate Model Examination Guidance

FHFA is charged by the Federal Housing Enterprises Financial Safety and Soundness Act of 1992, as amended, with the supervision of the Enterprises to ensure their safety and soundness.

FHFA maintains that it uses a risk-based approach to carry out its supervisory responsibilities. Within FHFA, DER is responsible for supervising and examining the Enterprises. DER prepares annual risk assessments that identify significant risks and supervisory concerns, and supervisory strategies and examination priorities that identify the activities to be conducted. DER then conducts its supervisory activities through targeted examinations and ongoing monitoring activities. According to FHFA, ongoing monitoring and targeted examinations serve complementary purposes. The purpose of ongoing monitoring is to analyze real-time information and to use those analyses to identify Enterprise practices and changes in an Enterprise's risk profile that may warrant supervisory attention. Targeted examinations complement ongoing monitoring: they enable examiners to conduct "a deep or comprehensive assessment" of the areas found to be of high importance or risk. Because each of these supervisory activities has a separate purpose, they are not interchangeable.

FHFA has long recognized the importance of evaluating high-risk models through its supervisory authorities. In March 2013, FHFA adopted a Risk Modeling examination module and work program that were developed by FHFA's supervision policy group and formally approved for use by FHFA examiners beginning with the 2014 examination cycle. The module explains that "[t]he overarching goal of a risk modeling examination is to verify independently the model results produced by the [Enterprises] so that the FHFA can have confidence that the [Enterprises] identify, measure, and manage risks appropriately."

This Risk Modeling examination module and associated work program were incorporated into FHFA's Examination Manual, adopted in December 2013. The introduction to this Manual states that the Manual "provides a description of the examination program and a policy overview, including FHFA's mission and examination authorities." The introduction also states that the Manual "sets forth the processes examiners follow when conducting examination activities….and describes the work products examiners produce during these activities." The Manual makes clear that use of the incorporated modules and work programs is mandatory for FHFA examiners, not discretionary:

> Examination modules provide **instruction** to examiners on how to assess specific topics, business lines, and risk areas. They contain workprograms that help

examiners assess the types of risk the regulated entity is exposed to, the level of risk exposure, the direction of risk, and the quality of risk management practices. (emphasis added).

Notwithstanding FHFA's adoption of this Risk Modeling examination module and work program, and clear direction to follow this module and work program, DER officials reported to us that DER did not require its examiners to use either one. The two examiners-in-charge (EICs) who manage the exam teams charged with conducting Enterprise supervision explained that, in DER's view, this examination module and work program were better suited for examinations of the FHLBanks.[10] As FHFA recognizes in AB 2013-07, the FHLBanks and the Enterprises differ substantially in their model risk management practices, and DER determined that neither the module nor work program was useful to DER examiners and use of either one was not required by DER.

DER, however, did not adopt its own risk modeling examination module or work program nor did it provide its examiners with clear guidance on model risk examinations.[11] DER officials reported to us that DER examiners looked primarily to AB 2013-07 when conducting model examinations. That advisory bulletin communicated FHFA's supervisory expectations for model risk management by its regulated entities: it was never intended to prescribe examination practices. These officials acknowledged that AB 2013-07 did not establish mandatory requirements or specific expectations that examiners must meet in performing model examinations. Accordingly, the targeted examinations of high-risk models from 2014 through 2019 were conducted by DER examiners without following a specific risk modeling module or work program.

FACTS AND ANALYSIS ....

Annually, DER develops a supervisory plan that sets forth the planned supervisory activities and specific examinations activities for the year, consisting of ongoing monitoring and targeted examinations. DER officials reported to us that DER performs targeted examinations of selected high-risk models, based on its view of the risks posed by those models and on prior examination work, and based on the examination resources available during the given examination cycle. DER has not issued internal guidance that prescribes the frequency with which high-risk models needed to be examined.

[10] As part of a recently announced realignment of the Agency, a new Deputy Director, DER, as well as an Associate Director, DER, were appointed effective February 3, 2020.

[11] During the course of this evaluation, DER provided us with a copy of the Enterprise-specific model risk management examination module that DER adopted in January 2020 for future use.

Over the Past Six Years, DER Has Planned a Small Number of Targeted Examinations of Enterprise High-Risk Models but Completed a Fraction of Those Examinations During the Annual Examination Cycle for Which They Were Planned

The current FHFA Director, in written testimony to the U.S. House of Representatives Committee on Financial Services in October 2019, advised that FHFA's examination work must be "consistently rigorous, timely, and effective" and that "additional resources are efficiently allocated to meet the needs of critical areas such as risk modeling and information technology."[12] As we now show, DER's track record of untimely completion of many of its planned targeted examinations of high-risk models does not align with the vision articulated by the Director.

To put the scale of the model risk examination landscape in perspective, as of the first quarter of 2019, Fannie Mae classified 97 (out of 291) of its models as high risk and Freddie Mac classified 23 (out of 129) of its models as high risk. For the last six annual examination cycles (2014 through 2019) (Review Period), DER planned a small number of targeted examinations of high-risk models at each Enterprise. DER records reflect that, during these six examination cycles, DER planned 12 targeted examinations of 16 high-risk models at Fannie Mae (16.49% coverage)[13] and planned 10 targeted examinations of 9 high-risk models at Freddie Mac (39.13% coverage), for an average of about 4 high-risk models planned per year across the two Enterprises.[14]

The former Deputy Director of DER (who was in place throughout the Review Period, but is no longer in that position) consistently maintained that DER expects all planned supervisory activities to be completed in the examination cycle for which they were planned. However, DER records show that DER failed to complete many of the planned targeted examinations during the same examination cycle. Of the 12 targeted examinations planned of 16 high-risk

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[12] House Committee on Financial Services, Testimony of Dr. Mark A. Calabria, Director, Federal Housing Finance Agency, "The Future of Affordable Housing in America Depends on Mortgage Finance Reform," at 4 (Oct. 22, 2019).

[13] In one of the targeted examinations, DER examined a suite containing three models. Because Fannie Mae's model inventory classified each component model as high risk but did not separately classify the suite, we counted the component models as three models in the total number of Fannie Mae high-risk models examined. DER conducted a second targeted examination that also covered these three models, which we did not double count in our total. That same examination covered two other high-risk models, which we did include in our total.

[14] Freddie Mac's model inventories for years 2014 through 2016 were not available in FHFA's examination records. We have no reason to believe the total inventory of high-risk models changed significantly from year to year. For our calculations, we relied on the Enterprises' model inventories for the first quarter of 2019.

models at Fannie Mae, one targeted examination of one high-risk model was cancelled. Of the remaining 11 targeted examinations planned of 15 high-risk models at Fannie Mae:[15]

- Six targeted examinations (54.55%) were completed during the same cycle;
- Three (27.27%) were completed during the next examination cycle; and
- Two (18.18%) were completed during a subsequent cycle.

Of the 10 targeted examinations planned of 9 high-risk models at Freddie Mac:

- Four targeted examinations (40%) were completed within the same cycle; and
- Six (60%) were completed during the next cycle.

According to FHFA's most recent Annual Performance Plan (Fiscal Year 2019), FHFA represented that completion of targeted examinations planned in written examination plans for the annual examination cycle is one tool it uses to assess the Enterprises' safety and soundness.[16] As DER's data shows, DER completed a total of 21 targeted examinations of 24 high-risk models during the six years of the Review Period, leaving the vast majority of the 120 high-risk models outside such supervisory oversight. Of these 21 targeted examinations, only 10 (47.62%) were completed during the examination cycle for which they were planned. However one chooses to characterize DER's performance of targeted examinations of high-risk models, the relatively small number of planned targeted examinations and low rate of completion during the planned supervisory cycle cannot reasonably be viewed as "consistently rigorous, timely, and effective" as expected by the FHFA Director.

In its technical comments and management response to a draft of this report, FHFA asserted that we had not taken into account other examination work, including targeted examinations conducted in other risk areas such as credit, market, and governance, ongoing monitoring, and ongoing monitoring of MRA remediation. FHFA's assertion is unfounded: during our fieldwork for this evaluation, we identified, from DER's examination plans for the Review Period, all targeted examinations related to high-risk models that were launched during the Review Period, including targeted examinations of high-risk models performed by model examiners in conjunction with DER's other risk branches, and reviewed those examination workpapers.

[15] Because DER cancelled a targeted examination of a high-risk model, the total number of high-risk Fannie Mae models actually examined over the six examination cycles is 15.

[16] See FHFA, *Annual Performance Plan for Fiscal Year 2019*, at pp. 5-6. FHFA has not issued an annual performance plan for Fiscal Year 2020.

FHFA's technical comments and management response also claim that this evaluation focused solely on targeted examinations of high-risk models at the Enterprises and ignored ongoing monitoring, which is part of its risk-based supervision. During this evaluation, our discussions with FHFA focused on targeted examinations, not ongoing monitoring activities. As defined by FHFA, targeted examinations enable examiners to conduct "a deep or comprehensive assessment" of the areas found to be of high importance or risk. High-risk models plainly fall within that definition. While DER's ongoing monitoring activities include model risk management, such activities, by definition, do not provide FHFA with the deep, comprehensive assessment of the Enterprises' high-risk models offered by targeted examinations.

Budgetary Constraints Purportedly Limit DER's Ability to Conduct Targeted Examinations of Models; EICs Attribute Small Supervisory Footprint Over Model Risk to Limited Resources

Based on our review of DER workpapers, an average of six model examiners were assigned to conduct targeted examinations of high-risk models each cycle during the Review Period, and DER completed a total of 21 targeted examinations of high-risk models during that period. That number amounts to an average rate of roughly 4 targeted examinations of 4 high-risk models per examination cycle. Of the 120 models classified as high risk by the Enterprises during the Review Period, DER examined 24 (20% coverage); the vast majority received no direct supervisory review through targeted examinations.

The EICs maintained that limited resources constricted DER's ability to provide greater supervisory coverage of the Enterprises' high-risk models. One EIC acknowledged that examiners who perform targeted examinations of high-risk models require specialized technical skills and experience, and examiners without such skills are not qualified to conduct such technical examinations. According to both EICs, DER, in lieu of examining a larger number of high-risk models, relied on its targeted examinations of the Enterprises' model risk management frameworks to get "comfortable" that the Enterprises were prudently managing their model risk. We understood the EICs to mean that DER sought to leverage each Enterprise's risk management framework (that is, the second line of defense) as a means of mitigating existing resource limitations to get "comfortable" that the Enterprises were managing their model risk in accordance with FHFA's supervisory expectations.

We reviewed DER's examination records and learned that DER had conducted one targeted examination of each Enterprise's model risk management framework: Freddie Mac in 2015 and Fannie Mae in 2017. We also learned that DER concluded at the end of those examinations that [redacted] set forth in FHFA's 2013 advisory bulletin on model risk management.[17] DER issued Matters Requiring Attention (MRAs) to the Enterprises that required remedial actions to correct the identified deficiencies. One Enterprise remediated its MRA [redacted] and DER closed the MRA on its books as of October 2019; the other Enterprise continues to have outstanding MRAs and, according to DER, [redacted]. In light of this information, we asked the EICs to explain the basis for their views that prior targeted examinations of the Enterprises' risk management frameworks gave them comfort. Each EIC confirmed our understandings that:

- DER examined each Enterprise's model risk management framework once during the Review Period to assess whether its risk management functions were overseeing model risk management effectively and met FHFA's expectations in AB 2013-07;
- During most of the Review Period, DER considered the [redacted]; and
- [redacted] could not be leveraged by DER to obtain comfort that the Enterprises were [redacted] in lieu of DER targeted examinations of a [redacted].

The EICs continued to assert that resource capacity was a limiting factor in the choice of models to examine in a given examination cycle. The EICs, however, did not maintain that the 21 completed examinations of 24 high-risk models provided adequate coverage of these models – nor could they. DER [redacted] on the Enterprises as a result of the 21 completed targeted examinations, demonstrating that DER [redacted] associated with the models examined.

Citing Budgetary Constraints to Justify Lack of Supervisory Activities Is Inconsistent with FHFA's Statutory Authority to Assess the Enterprises for the Full Costs of Supervising and Examining Them

In adopting HERA, Congress determined that FHFA's budget, like those of other federal financial regulators, would not be subject to funding through the annual appropriations process. HERA established that FHFA's operations would be funded through assessments levied directly on the entities it regulates, and authorizes the FHFA Director to assess the

[17] DER's examination records reflect that DER concluded, from a 2012 targeted examination, that [redacted] MRAs. Those MRAs remained open for [redacted]. At the conclusion of the 2017 targeted examination of the Fannie Mae model risk management framework, DER issued [redacted] MRAs.

Enterprises for the reasonable costs of the annual examinations of them.[18] Congress also gave the FHFA Director authority to levy additional, immediate assessments to cover the increased costs of taking supervisory action, including to address deficient practices at those entities.[19] This provision anticipates that FHFA will incur increased costs when it is necessary for the Agency to increase its supervisory activities, and makes clear that the regulated entities should pay for those increased costs. These provisions, taken together, empower the FHFA Director to assess the regulated entities for all costs incurred in examining them, and give the FHFA Director the discretion to determine what those costs will be. Pursuant to this statutory authority, the FHFA Director may set FHFA's annual examination budget to include the full cost of supervising and examining its regulated entities to ensure that they operate in a safe and sound manner.

In a recent audit, DER officials asserted to us that the prior FHFA Director made the decision to keep DER's budget flat for fiscal years 2016 through 2019, which constrained the supervisory activities that DER was able to conduct.[20] We note, however, that this representation conflicts with FHFA's representations in its most recent (2019) Performance and Accountability Report regarding its budgeting process. That report states, in pertinent part:

> FHFA develops its annual budget using a 'bottom up' approach. **Each office within the Agency is asked to bifurcate their budget request between the amount of resources needed for the regulation of Fannie Mae and Freddie Mac and the resources needed for the regulation of the FHLBanks. The office requests are then aggregated** (with overhead costs distributed proportionately) to determine the total expected costs associated with regulating Fannie Mae and Freddie Mac and the total expected costs associated with regulating the FHLBanks. These two totals, along with any expected collection for the working capital fund, comprise the fiscal year budget for the Agency. (emphasis added)

Had DER officials determined that additional model examiners were required for its supervisory activities of the Enterprises, DER should have increased its budget request, which, according to FHFA, would have been incorporated into FHFA's fiscal year budget. According to DER's budget requests for fiscal years 2015 through 2019, DER did not make

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[18] 12 U.S.C. §§ 4516(a), 4517(a).

[19] 12 U.S.C. §§ 4516(c)(3), 4517(b).

[20] OIG, *Despite Prior Commitments, FHFA Has Not Implemented a Systematic Workforce Planning Process to Determine Whether Enough Qualified Examiners are Available to Assess the Safety and Soundness of Fannie Mae and Freddie Mac*, at 14 (Feb. 25, 2020) (AUD-2020-004).

a request for additional examiners, but now claims that limited funding constricted its supervisory activities.

It appears to us that a determination, either by DER or former FHFA leadership, to fail to establish a budget adequate to fund FHFA's effective supervision of the Enterprises, is inconsistent with Congress' intent, as set forth in HERA.

DER's Failure to Meet its Commitment to Conduct Comprehensive Workforce Planning Has Adversely Affected its Capacity to Conduct and Complete Targeted Examinations of High-Risk Models

In 2013, we recommended that DER adopt and implement a systematic supervisory workforce planning process, and FHFA agreed to that recommendation. While DER claimed to have put into place such a process in 2014 and reaffirmed the importance of workforce planning in 2018, a recently issued audit found that DER failed to conduct systematic workforce planning.

Our recent audit concluded that the failure by DER over the 2012 through 2018 examination cycles (the period covered by the audit) to adopt and implement a systematic supervisory workforce planning process and its persistent failure to complete targeted examinations in the cycle for which they were planned calls into question its supervisory capacity.[21]

To the best of our knowledge, no systematic workforce planning process has been conducted for model risk. The impact of the lack of such a process is demonstrable in four related areas: qualifications for model examiners; number of model examiners; number of high-risk models to examine annually in targeted examinations; and completion of targeted examinations during the examination cycle for which they were planned.

- Qualifications for model examiners. While one EIC emphasized that examiners who perform targeted examinations of high-risk models require specialized technical skills and experience and examiners without such skills are not qualified to conduct such technical examinations, neither EIC specified the specialized technical skills and experience required. Had a division-level workforce planning process been undertaken, the required skill competencies should have been identified.

- Number of model examiners. Neither EIC expressed a view on the number of onsite model examiners DER should have. One EIC observed that his examination team currently has about 40 examiners but was unsure how many of those examiners should be model examiners. Again, a workforce planning process, if conducted, should have included this assessment.

[21] *Id.* at 16.

- Number of high-risk models to examine annually. Of the 120 models categorized by the Enterprises as high risk, DER examined four each year for the past six years – or coverage of 3.3% annually. Without a workforce planning analysis, DER has no rational basis on which to conclude that this coverage is adequate.

- Timely completion of targeted examinations. During the Review Period, consisting of six examination cycles, DER completed 10 of 21 targeted examinations of high-risk models during the examination cycle for which they were planned, yielding an untimely completion rate of 52.38%.

DER Is Increasing Resources, but Is Not Increasing the Number of Model Examiners on the Onsite Examination Teams

In October 2019, the then-Deputy Director of DER reported to us that DER had received authorization to add 10 new positions. In May 2019, she submitted a memorandum to the FHFA Acting Chief Operating Officer requesting the new positions. This memorandum set forth five "initiatives" underway at DER and asserted that the new positions "would significantly enhance DER's ability to execute ongoing improvements underway to strengthen the supervisory function." None of those initiatives pertain directly to increasing DER's capacity to conduct additional targeted examinations of high-risk models. Although the memorandum stated that DER intended to use two new positions "to hire modelers for data analytics to support model examinations," it did not request authorization to hire more model examiners for the onsite examination teams.[22]

To the best of our knowledge, DER has no current plans to add additional model examiners for its onsite examination teams. Accordingly, its capacity to examine the Enterprises' high-risk models will remain unchanged.

FINDINGS ....

- Despite DER's recognition of significant risks from the Enterprises' use of high-risk models, DER planned a small number of targeted examinations of those models and completed a fraction of them during the examination cycle for which they were planned.

[22] According to DER, these positions are assigned to a recently created Model Risk & Governance Branch of the Office of Risk Policy, which was created to provide an offsite model performance monitoring function to "analyze and run numbers through the models."

- Although DER officials asserted that budgetary constraints and limited resources contributed to DER's inability to conduct more targeted examinations of Enterprise high-risk models, DER has not made budget requests for additional model examiners.

- DER's failure to conduct systematic workforce analyses for model risk has deprived DER of the data necessary to determine: the number of high-risk models that it should examine annually; the necessary qualifications for model examiners; and the number of qualified model examiners needed to conduct and complete targeted examinations of high-risk models during the examination cycle for which they were planned.

CONCLUSION

The current FHFA Director advised that "[a]ll supervisory and oversight procedures and systems must ensure that…additional resources are efficiently allocated to meet the needs of critical areas such as risk modeling and information technology." Several provisions of HERA empower the FHFA Director to assess the Enterprises for the reasonable costs of the annual examination of them and to levy additional, immediate assessments to cover the increased costs of taking supervisory action, including to address deficient practices at those entities. Pursuant to statutory authority, the FHFA Director may set FHFA's annual examination budget to include the full cost of supervising and examining its regulated entities to ensure that they operate in a safe and sound manner. The determination, either by DER or former FHFA leadership, to fail to establish a budget adequate to fund FHFA's effective supervision of the Enterprises, is inconsistent with Congress' intent, as set forth in HERA. To the best of our knowledge, DER has no current plan to add additional model examiners to its onsite examination teams, and accordingly its capacity to examine the Enterprises' high-risk models remained unchanged.

RECOMMENDATIONS

1. In a recent audit report, *Despite Prior Commitments, FHFA Has Not Implemented a Systematic Workforce Planning Process to Determine Whether Enough Qualified Examiners are Available to Assess the Safety and Soundness of Fannie Mae and Freddie Mac* (Feb. 25, 2020) (AUD-2020-004), we concluded that DER's failure to adopt and implement a systematic workforce planning process and its persistent failure to complete targeted examinations in the cycle for which they were planned called into question DER's supervisory capacity. Because the performance data for completion of targeted examinations for high-risk models reflects the same concerns, we recommend that FHFA direct DER to develop and implement a systematic workforce

planning process within 12 months that aligns with Office of Personnel Management guidance and best practices and is fully documented. That process should include:

- Identifying the appropriate number of Enterprise high-risk models to be examined each year through targeted examinations;
- Identifying the current examination skills and competencies of examiners engaged in supervisory activities of high-risk models;
- Forecasting the optimal staffing levels and competencies of examiners necessary to complete the identified number of targeted examinations of high-risk models planned for each examination cycle;
- Evaluating whether a gap exists between skills required to conduct supervision of high-risk models that its examiners currently need but do not possess; and
- Addressing that gap.

2. Based on the results of its workforce analysis, conduct a written assessment of whether DER's current budget for its supervision of high-risk models is sufficient.

FHFA COMMENTS AND OIG RESPONSE..................................

We provided FHFA an opportunity to respond to a draft of this evaluation report. FHFA provided technical comments on the draft report and those comments were considered in finalizing this report. FHFA also provided a management response, which is included in the Appendix to this report. In its response, FHFA neither agreed nor disagreed with our recommendations. Rather, FHFA stated that in light of recent leadership changes in DER, DER is considering various opportunities to enhance the capabilities, processes, and resources of the supervision program, including its oversight of the Enterprises' models and model risk management. Accordingly, FHFA will assess the recommendations and provide a response by June 30, 2020.

OBJECTIVE, SCOPE, AND METHODOLOGY ....

We conducted this evaluation to assess FHFA's supervisory oversight of the Enterprises' model risk management.

To achieve this objective, we sought to determine the examiner resources dedicated to conduct targeted examinations of the Enterprises' high-risk models and the number of such examinations completed during the examination cycles of 2014 through 2019. We considered an examination to be completed during the examination cycle for which it was planned if DER completed it prior to the issuance of the Report of Examination. We also sought to determine the supervisory coverage of the 120 models that the Enterprises classified as high risk. The Review Period of this evaluation was 2014 through 2019.

We reviewed all applicable guidance and standards published by FHFA and DER in effect during our Review Period, including AB 2013-07, the PMOS, and the Examination Manual (in particular the risk modeling examination module and work program). We also interviewed the EICs for the Fannie Mae and Freddie Mac examination teams and the examination managers overseeing the targeted examinations of high-risk models.

Because DER maintains that its supervision of the Enterprises is risk-based, we focused primarily on those models the Enterprises identified as high risk. We performed several analyses related to DER's planned and completed targeted examinations of the Enterprises' high-risk models during our Review Period. We reviewed DER's examination plans for Fannie Mae and Freddie Mac during our Review Period to identify planned targeted examinations that may have covered specific models. We reviewed the workpapers of those targeted examinations to (1) identify each model that was within the scope of the examinations and (2) determine when DER commenced and completed the examinations. We then compared the models identified in the workpapers to the Enterprises' model inventories, which categorized models as high/very high, medium, or low risk, to compile the list of high-risk models that were examined during our Review Period. We also calculated the number of high-risk models relative to each Enterprises' total population of models. We did not independently verify the accuracy and completeness of the Enterprises' model inventories.

Finally, we analyzed DER's examiner resources dedicated to performing targeted examinations of the Enterprises' high-risk models and reviewed past and recent OIG reports that assessed FHFA staffing and completion of examination activities. We reviewed the examination workpapers to identify the model examiners who were assigned to conduct the targeted examinations of high-risk models during our Review Period. The OIG reports we reviewed included the following:

- OIG, *FHFA's Targeted Examinations of Fannie Mae: Less than Half of the Targeted Examinations Planned for 2012 through 2015 Were Completed and No Examinations Planned for 2015 Were Completed Before the Report of Examination Issued* (Sept. 30, 2016) (AUD-2016-006);

- OIG, *FHFA's Targeted Examinations of Freddie Mac: Just Over Half of the Targeted Examinations Planned for 2012 through 2015 Were Completed* (Sept. 30, 2016) (AUD-2016-007);

- OIG, *FHFA's Completion of Planned Targeted Examinations of Fannie Mae Improved from 2016 through 2018, But Timeliness Remained an Issue; With the June 2019 Issuance of the Single Security, FHFA Should Reassess its Supervision Framework for CSS* (Sept. 17, 2019) (AUD-2019-012);

- OIG, *FHFA's Completion of Planned Targeted Examinations of Freddie Mac Improved from 2016 through 2018, But Timeliness Remained an Issue* (Sept. 17, 2019) (AUD-2019-013); and

- OIG, *Despite Prior Commitments, FHFA Has Not Implemented a Systematic Workforce Planning Process to Determine Whether Enough Qualified Examiners are Available to Assess the Safety and Soundness of Fannie Mae and Freddie Mac* (Feb. 25, 2020) (AUD-2020-004).

The fieldwork for this report was completed between October 2019 and February 2020.

This evaluation was conducted under the authority of the Inspector General Act and in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation* (January 2012). These standards require us to plan and perform an evaluation based upon evidence sufficient to provide a reasonable basis to support its findings and recommendations. We believe that the findings and recommendations discussed in this report meet those standards.

APPENDIX: FHFA MANAGEMENT RESPONSE............................

Federal Housing Finance Agency

MEMORANDUM

TO: Kyle D. Roberts, Deputy Inspector General for Evaluations
FHFA Office of Inspector General (OIG)

FROM: Paul J. Miller, Deputy Director PJM
FHFA Division of Enterprise Regulation (DER)

SUBJECT: Draft OIG Report: *Despite FHFA's Recognition of Significant Risks Associated With Fannie Mae's and Freddie Mac's High-Risk Models, Its Examination of Those Models Over a Six-Year Period Has Been Neither Rigorous Nor Timely*

DATE: March 20, 2020

Thank you for the opportunity to respond to the draft report referenced above (Report). As the Report notes, DER agrees that high-risk models are critical to the Enterprises and important elements of the Agency's safety and soundness oversight. While the Report focuses solely on DER's completion of targeted examinations of high-risk models at the Enterprises, DER's risk-based supervision of the Enterprises' models and model risk management also includes targeted examinations completed by the exam teams in other risk areas (e.g., market risk, credit risk, governance), ongoing monitoring, and ongoing monitoring of MRA remediation.

As noted in the Report, FHFA announced a realignment of the Agency structure on January 30, 2020, including hiring a new Deputy Director and Associate Director for DER. In light of these leadership changes, DER is considering various opportunities to enhance the capabilities, processes, and resources of the supervision program, including our oversight of the Enterprises' models and model risk management. Accordingly, FHFA will assess the Report's recommendations and provide a response by June 30, 2020.

cc: Chris Bosland
Larry Stauffer
Scott Valentin
John Major

ADDITIONAL INFORMATION AND COPIES..............................

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