AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

must be available to the entire board of directors and to OSMO.

PART 652—FEDERAL AGRICULTURAL MORTGAGE CORPORATION FUNDING AND FISCAL AFFAIRS

Subpart A—Investment Management

Sec.
652.1 Purpose.
652.5 Definitions.
652.10 Investment management.
652.15 Non-program investment purposes and limitation.
652.20 Eligible non-program investments.
652.23 Other non-program investments.
652.25 Ineligible investments.
652.27 Reservation of authority for investment activities.
652.30 Interest rate risk management.
652.35 Liquidity management.
652.40 Liquidity reserve requirement and supplemental liquidity.
652.45 Temporary regulatory waivers or modifications for extraordinary situations.

Subpart B—Risk-Based Capital Requirements

652.50 Definitions.
652.55 General.
652.60 Corporate business planning.
652.61 Capital planning.
652.62 Notice to OSMO of capital distributions.
652.65 Risk-based capital stress test.
652.70 Risk-based capital level.
652.75 Your responsibility for determining the risk-based capital level.
652.80 When you must determine the risk-based capital level.
652.85 When to report the risk-based capital level.
652.90 How to report your risk-based capital determination.
652.95 Failure to meet capital requirements.
652.100 Audit of the risk-based capital stress test.

APPENDIX A TO SUBPART B OF PART 652—RISK-BASED CAPITAL STRESS TEST

AUTHORITY: Secs. 4.12, 5.9, 5.17, 8.11, 8.31, 8.32, 8.33, 8.34, 8.35, 8.36, 8.37, 8.41 of the Farm Credit Act (12 U.S.C. 2183, 2243, 2252, 2279aa–11, 2279bb, 2279bb–1, 2279bb–2, 2279bb–3, 2279bb–4, 2279bb–5, 2279bb–6, 2279cc); sec. 514 of Pub. L. 102–552, 106 Stat. 4102; sec. 118 of Pub. L. 104–105, 110 Stat. 168; sec. 939A of Pub. L. 111–203, 124 Stat. 1326, 1887 (15 U.S.C. 78o–7 note) (July 21, 2010).

SOURCE: 70 FR 40644, July 14, 2005, unless otherwise noted.

Subpart A—Investment Management

SOURCE: 77 FR 66382, Nov. 5, 2012, unless otherwise noted.

§ 652.1 Purpose.

The purpose of this subpart is to ensure safety and soundness, continuity of funding, and appropriate use of non-program investments considering the Federal Agricultural Mortgage Corporation's (Farmer Mac or Corporation) special status as a Government-sponsored enterprise (GSE). The subpart contains requirements for Farmer Mac's board of directors to adopt policies covering such areas as investment management, interest rate risk, and liquidity reserves. The subpart also requires Farmer Mac to comply with various reporting requirements.

§ 652.5 Definitions.

For purposes of this subpart, the following definitions will apply:

Affiliate means any entity established under authority granted to the Corporation under section 8.3(c)(14) of the Farm Credit Act of 1971, as amended.

Asset-backed securities (ABS) mean investment securities that provide for ownership of a fractional undivided interest or collateral interests in specific assets of a trust that are sold and traded in the capital markets. For the purpose of this subpart, ABS exclude mortgage-backed securities that are defined below.

Cash means cash balances held at Federal Reserve Banks, proceeds from traded-but-not-yet-settled debt, and deposit accounts at Federal Deposit Insurance Corporation-insured banks.

Diversified investment fund (DIF) means an investment company registered under section 8 of the Investment Company Act of 1940.

Farmer Mac, Corporation, you, and your means the Federal Agricultural Mortgage Corporation and its affiliates.

FCA, our, us, or we means the Farm Credit Administration.

Government-sponsored enterprise (GSE) means an entity established or chartered by the United States Government to serve public purposes specified by the United States Congress but whose

debt obligations are not explicitly guaranteed by the full faith and credit of the United States Government.

Long-Term Standby Purchase Commitment (LTSPC) is a commitment by Farmer Mac to purchase specified eligible loans on one or more undetermined future dates. In consideration for Farmer Mac's assumption of the credit risk on the specified loans underlying an LTSPC, Farmer Mac receives an annual commitment fee on the outstanding balance of those loans in monthly installments based on the outstanding balance of those loans.

Market risk means the risk to your financial condition because the value of your holdings may decline if interest rates or market prices change. Exposure to market risk is measured by assessing the effect of changing rates and prices on either the earnings or economic value of an individual instrument, a portfolio, or the entire Corporation.

Maturing obligations means maturing debt and other obligations that may be expected, such as buyouts of long-term standby purchase commitments or repurchases of agricultural mortgage securities.

Mortgage-backed securities (MBS) means securities that are either:

(1) Pass-through securities or participation certificates that represent ownership of a fractional undivided interest in a specified pool of residential (excluding home equity loans), multifamily or commercial mortgages, or

(2) A multiclass security (including collateralized mortgage obligations and real estate mortgage investment conduits) that is backed by a pool of residential, multifamily or commercial real estate mortgages, pass through MBS, or other multiclass MBS.

(3) This definition does not include agricultural mortgage-backed securities guaranteed by Farmer Mac itself.

Non-program investments means investments other than those in:

(1) ''Qualified loans'' as defined in section 8.0(9) of the Farm Credit Act of 1971, as amended; or

(2) Securities collateralized by ''qualified loans.''

OSMO means FCA's Office of Secondary Market Oversight.

Program assets means on-balance sheet ''qualified loans'' as defined in section 8.0(9) of the Farm Credit Act of 1971, as amended.

Program obligations means off-balance sheet ''qualified loans'' as defined in section 8.0(9) of the Farm Credit Act of 1971, as amended.

Regulatory capital means your core capital plus an allowance for losses and guarantee claims, as determined in accordance with generally accepted accounting principles.

U.S. Government agency means an instrumentality of the U.S. Government whose obligations are fully guaranteed as to the payment of principal and interest by the full faith and credit of the U.S. Government.

[79 FR 53127, Sept. 8, 2014, as amended at 83 FR 55097, Nov. 2, 2018]

§ 652.10 Investment management.

(a) *Responsibilities of the board of directors.* Your board of directors must adopt written policies for managing your non-program investment activities. Your board must also ensure that management complies with these policies and that appropriate internal controls are in place to prevent loss. At least annually, your board, or a designated committee of the board, must review the sufficiency of these investment policies. Any changes to the policies must be adopted by the board. You must report any changes to these policies to the OSMO within 10 business days of adoption.

(b) *Investment policies—general requirements.* Your investment policies must address the purposes and objectives of investments, risk tolerance, delegations of authority, internal controls, due diligence, and reporting requirements. Moreover, your investment policies must fully address the extent of pre-purchase analysis that management must perform for various types, classes, and structure of investments. Furthermore, the policies must include reporting requirements and approvals needed for exceptions to the board's policies. Investment policies must be sufficiently detailed, consistent with, and appropriate for the amounts, types, and risk characteristics of your investments. You must document in the Corporation's records any analyses

used in formulating your policies or amendments to the policies.

(c) *Investment policies—risk tolerance.* Your investment policies must establish risk limits for the various types, classes, and sectors of eligible investments. These policies must include concentration limits to ensure prudent diversification of credit, market, and liquidity risks in the investment portfolio. Risk limits must be based on all relevant factors, including the Corporation's objectives, capital position, earnings, and quality and reliability of risk management systems. Your policies must identify the types and quantity of investments that you will hold to achieve your objectives and control credit, market, liquidity, and operational risks. Your policies must establish risk limits for the following types of risk:

(1) *Credit risk.* Your investment policies must establish:

(i) Credit quality standards, limits on counterparty risk, and risk diversification standards that limit concentrations in a single or related counterparty(ies), industry sectors, and asset classes or obligations with similar characteristics.

(ii) Criteria for selecting brokers, dealers, and investment bankers (collectively, securities firms). You must buy and sell eligible investments with more than one securities firm. As part of your review of your investment policies required under paragraph (a) of this section, your board of directors, or a designated committee of the board, must review the criteria for selecting securities firms. Any changes to the criteria must be approved by the board.

(iii) Collateral margin requirements on repurchase agreements. You must regularly mark the collateral to market and ensure appropriate controls are maintained over collateral held.

(2) *Market risk.* Your investment policies must set market risk limits for specific types of investments and for the investment portfolio.

(3) *Liquidity risk.* Your investment policies must describe the liquidity characteristics of eligible investments that you will hold to meet your liquidity needs and the Corporation's other objectives.

(4) *Operational risk.* Investment policies must address operational risks, including delegations of authority and internal controls in accordance with paragraphs (d) and (e) of this section.

(5) *Concentration risk.* Your investment policies must set risk diversification standards. Diversification parameters must be based on the carrying value of investments. You may not invest more than 10 percent of your Regulatory Capital in allowable investments issued by any single entity, issuer, or obligor. Only investments in obligations backed by U.S. Government agencies or GSEs may exceed the 10-percent limit.

(d) *Delegation of authority.* All delegations of authority to specified personnel or committees must state the extent of management's authority and responsibilities for investments.

(e) *Internal controls.* You must:

(1) Establish appropriate internal controls to detect and prevent loss, fraud, embezzlement, conflicts of interest, and unauthorized investments.

(2) Establish and maintain a separation of duties between personnel who supervise or execute investment transactions and personnel who supervise or engage in all other investment-related functions.

(3) Maintain records and management information systems that are appropriate for the level and complexity of your investment activities.

(4) Implement an effective internal audit program to review, at least annually, your investment management functions, controls, processes, and compliance with FCA regulations. The scope of the annual review must be appropriate for the size, risk, and complexity of the investment portfolio.

(f) *Due diligence*—(1) *Pre-purchase analysis*—(i) *Objective, eligibility, and compliance with investment policies.* Before you purchase an investment, you must conduct sufficient due diligence to determine whether the investment is eligible under § 652.20, is for an authorized purpose under § 652.15(a), and complies with your board-approved investment policies. You must document its eligibility, purpose, and investment policy compliance and your investment objective. Your investment policies must fully address the extent of pre-

purchase analysis that management must perform for various types, classes, and structure of investments. Your board must approve your decision to hold an investment that does not comply with your written investment policy requirements.

(ii) *Valuation*. Prior to purchase, you must verify the value of the investment (unless it is a new issue) with a source that is independent of the broker, dealer, counterparty or other intermediary to the transaction.

(iii) *Risk assessment*. Your risk assessment must be documented and, at a minimum, include an evaluation of credit risk, market risk, and liquidity risk and the underlying collateral of the investment. You must conduct stress testing before you purchase any investment that is structured or that has uncertain cash flows, including all mortgage-backed securities or asset-backed securities. The stress testing must be commensurate with the risk and complexity of the investments and must comply with the requirements of paragraph (f)(4) of this section.

(2) *Monthly fair value determination*. At least monthly, you must determine the fair market value of each investment in your portfolio and the fair market value of your whole investment portfolio.

(3) *Ongoing analysis of credit risk*. You must establish and maintain processes to monitor and evaluate changes in the credit quality of each security and the whole investment portfolio on an ongoing basis.

(4) *Quarterly stress testing*. (i) You must stress test your entire investment portfolio, including stress tests of all investments individually and stress tests of the portfolio as a whole, at the end of each quarter. The stress tests must enable you to determine that your investment securities, both individually and on a portfolio-wide basis, do not expose your capital, earnings, or liquidity to risks that exceed the risk tolerance specified in your investment policies. If your portfolio risk exceeds your investment policy limits, you must develop a plan to reduce risk and comply with your investment policy limits.

(ii) Your stress tests must be comprehensive and appropriate for the risk profile of your investment portfolio and the Corporation. At a minimum, the stress tests must be able to measure the price sensitivity of investments over a range of possible interest rate/yield curve scenarios. The methodology that you use to analyze investment securities must be appropriate for the complexity, structure, and cash flows of the investments in your portfolio. You must rely to the maximum extent practicable on verifiable information to support all your assumptions, including prepayment and interest rate volatility assumptions, when you apply your stress tests. Your assumptions must be prudent and based on sound judgment, and you must document the basis for all assumptions that you use to evaluate the security and its underlying collateral. You must also document all subsequent changes in your assumptions.

(5) *Presale value verification*. Before you sell an investment, you must verify its value with a source that is independent of the broker, dealer, counterparty, or other intermediary to the transaction.

(g) *Reports to the board of directors*. At least quarterly, executive management must report on the following to the board of directors or a designated committee of the board:

(1) Plans and strategies for achieving the board's objectives for the investment portfolio;

(2) Whether the investment portfolio effectively achieves the board's objectives;

(3) The current composition, quality, and liquidity profile of the investment portfolio;

(4) The performance of each class of investments and the entire investment portfolio, including all gains and losses that you incurred during the quarter on individual securities that you sold before maturity and why they were liquidated;

(5) Potential risk exposure to changes in market interest rates as identified through quarterly stress testing and any other factors that may affect the value of your investment holdings;

(6) How investments affect your capital, earnings, and overall financial condition;

(7) Any deviations from the board's policies. These deviations must be formally approved by the board of directors.

[77 FR 66382, Nov. 5, 2012, as amended at 83 FR 55097, Nov. 2, 2018]

§ 652.15 Non-program investment purposes and limitation.

(a) Farmer Mac is authorized to hold eligible non-program investments listed under § 652.20 for the purposes of enterprise risk management, including complying with its interest rate risk requirements in § 652.30; complying with its liquidity requirements in § 652.40; managing surplus short-term funds; and complementing program business activities.

(b) Non-program investments cannot exceed 35 percent of program assets and program obligations, excluding 75 percent of the program assets that are guaranteed by the United States Department of Agriculture as described in section 8.0(9)(B) of the Farm Credit Act of 1971, as amended. When calculating the total amount of non-program investments under this section, exclude investments pledged to meet margin requirements on derivative transactions.

§ 652.20 Eligible non-program investments.

(a) Eligible investments consist of:

(1) A non-convertible senior debt security.

(2) A money market instrument with a maturity of 1 year or less.

(3) A portion of an ABS or MBS that is fully guaranteed by a U.S. Government agency.

(4) A portion of an ABS or MBS that is fully and explicitly guaranteed as to the timely payment of principal and interest by a GSE.

(5) The senior-most position of an ABS or MBS that is not fully guaranteed by a U.S. Government agency or fully and explicitly guaranteed as to the timely payment of principal and interest by a GSE, provided that the MBS satisfies the definition of ''mortgage related security'' in 15 U.S.C. 78c(a)(41).

(6) An obligation of an international or multilateral development bank in which the U.S. is a voting member.

(7) Shares of a diversified investment fund, if its portfolio consists solely of securities that satisfy investments listed in paragraphs (b)(1) through (b)(3) of this section.

(b) Farmer Mac may only purchase those eligible investments satisfying all of the following:

(1) At a minimum, at least one obligor of the investment has a very strong capacity to meet financial commitments for the life of the investment, even under severely adverse or stressful conditions, and generally presents a very low risk of default. Investments whose obligors are located outside the U.S., and whose obligor capacity to meet financial commitments is being relied upon to satisfy this requirement, must also be fully guaranteed by a U.S. Government agency.

(2) The investment must exhibit low credit risk and other risk characteristics consistent with the purpose or purposes for which it is held.

(3) The investment must be denominated in U.S. dollars.

[83 FR 55097, Nov. 2, 2018]

§ 652.23 Other non-program investments.

(a) Farmer Mac may make a written request for our approval to purchase and hold other non-program investments that do not satisfy the requirements of § 652.20. Your request for our approval to purchase and hold other non-program investments at a minimum must:

(1) Describe the investment structure;

(2) Explain the purpose and objectives for making the investment; and

(3) Discuss the risk characteristics of the investment, including an analysis of the investment's impact to capital.

(b) We may impose written conditions in conjunction with our approval of your request to invest in other non-program investments.

(c) For purposes of applying the provisions of this subpart, except § 652.20, investments approved under this section are treated the same as eligible non-program investments unless our conditions of approval state otherwise.

[83 FR 55098, Nov. 2, 2018]

§ 652.25 Ineligible investments.

(a) *Investments ineligible when purchased*. Non-program investments that do not satisfy the eligibility criteria set forth in § 652.20(a) or have not been approved by the FCA pursuant to § 652.23 at the time of purchase are ineligible. You must not purchase ineligible investments. If you determine that you have purchased an ineligible investment, you must notify us within 15 calendar days after such determination. You must divest of the investment no later than 60 calendar days after you determine that the investment is ineligible unless we approve, in writing, a plan that authorizes you to divest the investment over a longer period of time. Until you divest of the investment, it may not be used to satisfy your liquidity requirement(s) under § 652.40, but must continue to be included in the § 652.15(b) investment portfolio limit calculation.

(b) *Investments that no longer satisfy eligibility criteria*. If you determine that a non-program investment no longer satisfies the criteria set forth in § 652.20 or no longer satisfies the conditions of approval issued under § 652.23, you must notify us within 15 calendar days after such determination. If approved by the FCA in writing, you may continue to hold the investment, subject to the following and any other conditions we impose:

(1) You may not use the investment to satisfy your § 652.40 liquidity requirement(s);

(2) The investment must continue to be included in your § 652.15 investment portfolio limit calculation; and

(3) You must develop a plan to reduce the investment's risk to you.

[83 FR 55098, Nov. 2, 2018]

§ 652.27 Reservation of authority for investment activities.

FCA retains the authority to require you to divest of any investment at any time for failure to comply with applicable regulations, for safety and soundness reasons, or failure to comply with written conditions of approval. The timeframe set by FCA for such required divestiture will consider the expected loss on the transaction (or transactions) and the effect on your financial condition and performance. FCA may also, on a case-by-case basis, determine that a particular non-program investment poses inappropriate risk, notwithstanding that it satisfies investment eligibility criteria or received prior approval from us. If so, we will notify you as to the proper treatment of the investment.

[83 FR 55098, Nov. 2, 2018]

§ 652.30 Interest rate risk management.

(a) The board of directors of Farmer Mac must provide effective oversight (direction, controls, and supervision) of interest rate risk management and must be knowledgeable of the nature and level of interest rate risk taken by Farmer Mac.

(b) The board of directors of Farmer Mac must adopt an interest rate risk management policy that establishes appropriate interest rate risk exposure limits based on the Corporation's risk-bearing capacity and reporting requirements in accordance with paragraphs (c) and (d) of this section. At least annually, the board of directors, or a designated committee of the board, must review the policy. Any changes to the policy must be approved by the board of directors. You must report any changes to the policy to the OSMO within 10 business days of adoption.

(c) The interest rate risk management policy must, at a minimum:

(1) Address the purpose and objectives of interest rate risk management;

(2) Identify the causes of interest rate risk and set appropriate quantitative limits consistent with a clearly articulated board risk tolerance;

(3) Require management to establish and implement comprehensive procedures to measure the potential effect of these risks on the Corporation's projected earnings and market values by conducting interest rate stress tests and simulations of multiple economic scenarios at least quarterly. Your stress tests must gauge how interest rate fluctuations affect the Corporation's capital, earnings, and liquidity position. The methodology that you use must be appropriate for the complexity of the structure and cash flows of your on- and off-balance sheet positions, including the nature and purpose

of derivative contracts, and establish counterparty risk thresholds and limits for derivatives. It must also ensure an appropriate level of consistency with the stress-test scenarios considered under § 652.10(f)(4). Assumptions applied in stress tests must, to the maximum extent practicable, rely on verifiable information. You must document the basis for all assumptions that you use.

(4) Describe and authorize management to implement actions needed to achieve Farmer Mac's desired risk management objectives;

(5) Ensure procedures are established to evaluate and document, at least quarterly, whether actions taken have actually met the Corporation's desired risk management objectives;

(6) Identify exception parameters and approvals needed for any exceptions to the policy's requirements;

(7) Describe delegations of authority; and,

(8) Describe reporting requirements, including exceptions to policy limits.

(d) At least quarterly, management must report to the Corporation's board of directors, or a designated committee of the board, describing the nature and level of interest rate risk exposure. Any deviations from the board's policy on interest rate risk must be specifically identified in the report and approved by the board, or a designated committee of the board.

§ 652.35 Liquidity management.

(a) *Liquidity policy—board responsibilities.* Farmer Mac's board of directors must adopt a liquidity policy, which may be integrated into a comprehensive asset-liability management or enterprise-wide risk management policy. The risk tolerance embodied in the liquidity policy must be consistent with the investment management policies required by § 652.10 of this subpart. The board must ensure that management uses adequate internal controls to ensure compliance with its liquidity policy. At least annually, the board of directors or a designated committee of the board must review the sufficiency of the liquidity policy. The board of directors must approve any changes to the policy. You must provide a copy of the revised liquidity policy to the OSMO within 10 business days of adoption.

(b) *Policy content.* Your liquidity policy must contain at a minimum the following:

(1) The purpose and objectives of liquidity reserves;

(2) Diversification requirements for your liquidity reserve portfolio;

(3) The minimum and target (or optimum) amounts of liquidity that the board has established for Farmer Mac, expressed in days of maturing obligations;

(4) The maximum amount of non-program investments that can be held for meeting Farmer Mac's liquidity needs, expressed as a percentage of program assets and program obligations;

(5) Exception parameters and approvals needed with respect to the liquidity reserve;

(6) Delegations of authority pertaining to the liquidity reserve;

(7) Reporting requirements which must comply with the requirements under paragraph (c) of this section;

(c) *Reporting requirements*—(1) *Board reporting*—(i) *Periodic.* At least quarterly, Farmer Mac's management must report to Farmer Mac's board of directors or a designated committee of the board describing, at a minimum, the status of Farmer Mac's compliance with board policy and the performance of the liquidity reserve portfolio.

(ii) *Special.* Management must report any deviation from Farmer Mac's liquidity policy, or failure to meet the board's liquidity targets to the board before the end of the quarter if such deviation or failure has the potential to cause material loss.

(2) *OSMO reporting.* Farmer Mac must report, in writing, to the OSMO no later than the next business day following the discovery of any breach of the minimum liquidity reserve requirement in § 652.40 of this subpart.

(d) *Liability maturity management plan.* Farmer Mac must have a liability maturity management plan (LMMP) that its board of directors reviews and approves at least once each year. The LMMP must establish a funding strategy that provides for effective diversification of the sources and tenors of funding, and considers Farmer Mac's

risk profile and current market conditions. The LMMP must include targets of acceptable ranges of the proportion of debt maturing within specific time periods.

(e) *Contingency funding plan.* (1) *General.* Farmer Mac must have a CFP to ensure sources of liquidity are sufficient to fund normal operations under a variety of stress events. Such stress events include, but are not limited to market disruptions, rapid increase in contractually required loan purchases, unexpected requirements to fund commitments or revolving lines of credit or to fulfill guarantee obligations, difficulties in renewing or replacing funding with desired terms and structures, requirements to pledge collateral with counterparties, and reduced market access.

(2) *CFP requirements.* Farmer Mac must maintain an adequate level of unencumbered and marketable assets (as defined in § 652.40(a) and (b) of this subpart) in its liquidity reserve that can be converted into cash to meet its net liquidity needs for 30 days based on estimated cash inflows and outflows under an acute stress scenario. The board of directors must review and approve the CFP at least once each year and must make adjustments to reflect changes in the results of stress tests, Farmer Mac's risk profile, and market conditions.

(3) The CFP must:

(i) Be customized to the financial condition and liquidity risk profile of Farmer Mac, the board's liquidity risk tolerance, and Farmer Mac's business model;

(ii) Identify funding alternatives that can be implemented as access to funding is impeded;

(iii) Establish a process for managing events that imperil Farmer Mac's liquidity. The process must assign appropriate personnel and executable action plans to implement the CFP;

(iv) Require periodic stress testing that analyzes the possible impacts on Farmer Mac's cash flows, liquidity position, profitability, and solvency for a wide variety of stress scenarios.

[78 FR 65553, Nov. 1, 2013; 79 FR 29074, May 21, 2014]

§ 652.40 Liquidity reserve requirement and supplemental liquidity.

(a) *Unencumbered.* All investments that Farmer Mac holds in its liquidity reserve and as supplemental liquidity in accordance with this section must be unencumbered. For the purposes of this section, an investment is unencumbered if it is free of lien, and it is not explicitly or implicitly pledged to secure, collateralize, or enhance the credit of any transaction. Additionally, an unencumbered investment held in the liquidity reserve cannot be used as a hedge against interest rate risk if liquidation of that particular investment would expose Farmer Mac to a material risk of loss.

(b) *Marketable.* All investments that Farmer Mac holds in its liquidity reserve in accordance with this section must be readily marketable. For purposes of this section, an investment is readily marketable if it:

(1) Can be easily and quickly converted into cash with little or no loss in value;

(2) Exhibits low credit and market risk;

(3) Has ease and certainty of valuation; and,

(4) Except for money market instruments, can be easily sold or converted to cash through repurchase agreements in active and sizable markets without significantly affecting prices.

(c) *Liquidity reserve requirement, supplemental liquidity, and discounts.* Farmer Mac must maintain at all times a liquidity reserve sufficient to fund at least 90 days of the principal portion of maturing obligations and other borrowings. Farmer Mac must also hold supplemental liquid assets sufficient to fund obligations and other borrowings maturing after 90 calendar days to meet board liquidity policy in accordance with § 652.35. At a minimum, Farmer Mac must hold instruments in the liquidity reserve, and as supplemental liquidity, that are listed and discounted in accordance with the following table, and are sufficient to cover:

(1) Days 1 through 15 only with Level 1 instruments;

(2) Days 16 through 30 only with Level 1 and Level 2 instruments; and,

(3) Days 31 through 90 with Level 1, Level 2, and Level 3 instruments.

TABLE TO § 652.40(C)

Liquidity level	Instruments	Discount (multiply market value by)
Level 1	Cash, including cash due from traded but not yet settled debt	100 percent.
	Overnight money market instruments, including repurchase agreements secured exclusively by Level 1 investments.	100 percent.
	Obligations of U.S. Government agencies with a final remaining maturity of 3 years or less.	97 percent.
	GSE senior debt securities that mature within 60 days, excluding securities issued by the Farm Credit System.	95 percent.
	Diversified investment funds comprised exclusively of Level 1 instruments.	95 percent.
Level 2	Additional Level 1 investments	Discount for each Level 1 investment applies.
	Obligations of U.S. Government agencies with a final remaining maturity of more than 3 years.	97 percent.
	MBS that are fully guaranteed by a U.S. Government agency	95 percent.
	Diversified investment funds comprised exclusively of Level 1 and 2 instruments.	95 percent.
Level 3	Additional Level 1 or Level 2 investments	Discount for each Level 1 or Level 2 investment applies.
	GSE senior debt securities with maturities exceeding 60 days, excluding senior debt securities of the Farm Credit System.	93 percent for all instruments in Level 3.
	MBS that are fully guaranteed by a GSE as to the timely repayment of principal and interest.	
	Money market instruments maturing within 90 days.	
	Diversified investment funds comprised exclusively of Levels 1, 2, and 3 instruments.	
	Qualifying securities backed by Farmer Mac program assets (loans) guaranteed by the United States Department of Agriculture (excluding the portion that would be necessary to satisfy obligations to creditors and equity holders in Farmer Mac II LLC).	
Supplemental Liquidity	Eligible investments under § 652.20 and those approved under § 652.23.	90 percent except discounts for Level 1, 2 or 3 investments apply to such investments held as supplemental liquidity.

[78 FR 65553, Nov. 1, 2013; 79 FR 29074, May 21, 2014, as amended at 83 FR 55098, Nov. 2, 2018]

§ 652.45 Temporary regulatory waivers or modifications for extraordinary situations.

Whenever the FCA determines that an extraordinary situation exists that necessitates a temporary regulatory waiver or modification, the FCA may, in its sole discretion:

(a) Modify or waive the minimum liquidity reserve requirement in § 652.40 of this subpart;

(b) Modify the amount, qualities, and types of eligible investments that you are authorized to hold pursuant to § 652.20 of this subpart; and/or

(c) Take other actions as deemed appropriate.

Subpart B—Risk-Based Capital Requirements

SOURCE: 71 FR 77253, Dec. 26, 2006, unless otherwise noted.

§ 652.50 Definitions.

For purposes of this subpart, the following definitions will apply:

AgVantage Plus means both the product by that name used by Farmer Mac and other similarly structured program volume that Farmer Mac might finance in the future under other names. Those AgVantage securities with initial principal amounts under $25 million and whose issuers were part of the original AgVantage program are excluded from this definition.

Farmer Mac, Corporation, you, and your means the Federal Agricultural Mortgage Corporation and its affiliates as defined in subpart A of this part.

Our, us, or we means the Farm Credit Administration.

Regulatory capital means the sum of the following as determined in accordance with generally accepted accounting principles:

(1) The par value of outstanding common stock;

(2) The par value of outstanding preferred stock;

(3) Paid-in capital, which is the amount of owner investment in Farmer Mac in excess of the par value of stock;

(4) Retained earnings; and,

(5) Any allowances for losses on loans and guaranteed securities.

Risk-based capital means the amount of regulatory capital sufficient for Farmer Mac to maintain positive capital during a 10-year period of stressful conditions as determined by the risk-based capital stress test described in § 652.65.

Rural utility guarantee fee means the actual guarantee fee charged for off-balance sheet volume and the earnings spread over Farmer Mac's funding costs for on-balance sheet volume on rural utility loans.

[71 FR 77253, Dec. 26, 2006, as amended at 76 FR 23467, Apr. 27, 2011]

§ 652.55 General.

You must hold risk-based capital in an amount determined in accordance with this subpart.

§ 652.60 Corporate business planning.

(a) Farmer Mac's board of directors is responsible for ensuring that Farmer Mac maintain capital at a level that is sufficient to ensure continued financial viability and provide for growth. In addition, Farmer Mac's capital must be sufficient to meet statutory and regulatory requirements as well as the goals and objectives required by paragraph (b)(5) of this section, including the Tier 1 ratio required in § 652.61(c)(2)(ii)(A). Farmer Mac must notify the OSMO within 10 calendar days of determining that capital is not sufficient to meet those goals and objectives.

(b) No later than 65 days after the end of each calendar year, Farmer Mac's board of directors must adopt an operational and strategic business plan for at least the next 3 years. The plan must include:

(1) A mission statement;

(2) A business and organizational overview and an assessment of management capabilities;

(3) An assessment of Farmer Mac's strengths and weaknesses;

(4) A review of the internal and external factors that are likely to affect Farmer Mac during the planning period;

(5) Measurable goals and objectives;

(6) A discussion of how these factors might impact Farmer Mac's current financial position and business goals;

(7) Forecasted income, expense, and balance sheet statements for each year of the plan;

(8) A marketing plan, and

(9) A capital plan in accordance with § 652.61.

[78 FR 65149, Oct. 31, 2013]

§ 652.61 Capital planning.

(a) *Purpose.* This section establishes capital planning requirements for Farmer Mac.

(b) *Definitions.* For purposes of this section and § 652.62, the following definitions apply:

Basel III means the Basel Committee on Banking Supervision's document ''Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems,'' June 2011 and as it may be updated from time to time.

Capital action means any issuance of an equity capital instrument, and any capital distribution, as well as any similar action that OSMO determines could impact Farmer Mac's consolidated capital.

Capital distribution means a redemption or repurchase of any equity capital instrument, a payment of common or preferred stock dividends, a payment that may be temporarily or permanently suspended by the issuer on any instrument that is eligible for inclusion in the numerator of any minimum capital ratio, and any similar transaction that OSMO determines to be in substance a distribution of capital.

Capital plan means a written presentation of Farmer Mac's capital planning strategies and capital adequacy process that includes the mandatory elements set forth in paragraph (c)(2) of this section.

Capital policy means Farmer Mac's written assessment of the principles and guidelines used for capital planning, capital issuance, usage and distributions, including internal capital goals; the quantitative or qualitative guidelines for dividend and stock repurchases; the strategies for addressing potential capital shortfalls; and the internal governance procedures around capital policy principles and guidelines.

Planning horizon means the period of at least 12 quarters, beginning with the quarter preceding the quarter in which Farmer Mac submits its capital plan, over which the relevant projections extend.

Tier 1 Capital means the components meeting the criteria of Common Equity Tier 1 Capital and Additional Tier 1 Capital and the regulatory adjustments as set forth in Basel III, or Tier 1 Capital as defined in regulations of the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve, or the Federal Deposit Insurance Corporation, as revised from time to time; or another measure of high quality capital as approved for use under this regulation by the Director of OSMO.

Tier 1 ratio means the ratio of Farmer Mac's Tier 1 Capital to Total Risk-Weighted Assets.

Total Risk-Weighted Assets means a risk-weighting approach that is appropriate given Farmer Mac's business activities and consistent with broadly accepted banking practices and standards (e.g., one of the frameworks of the Basel Committee on Banking Supervision or similar U.S. regulations).

(c) *General requirements*—(1) *Annual capital planning.* (i) Farmer Mac must develop and maintain a capital plan each year.

(ii) Farmer Mac must submit its complete annual capital plan to OSMO by March 1 or such later date as directed by OSMO, after consultation with the FCA Board.

(iii) Prior to submission of the capital plan under paragraph (c)(1)(ii) of this section, Farmer Mac's board of directors must:

(A) Review the robustness of Farmer Mac's process for assessing capital adequacy,

(B) Ensure that any deficiencies in Farmer Mac's process for assessing capital adequacy are appropriately remedied; and

(C) Approve Farmer Mac's capital plan.

(2) *Mandatory elements of capital plan.* The capital plan must contain at least the following elements:

(i) An assessment of the expected uses and sources of capital over the planning horizon that reflects Farmer Mac's size, complexity, risk profile, and scope of operations, assuming both expected and stressful conditions, including:

(A) Projected revenues, losses, reserves, and pro forma capital levels, including the core capital and regulatory capital ratios required by sections 8.32 and 8.33 of the Act, the Tier 1 ratio as defined in this section, and any additional capital measures deemed relevant by Farmer Mac, over the planning horizon under expected conditions and under a range of at least two progressively severe stress scenarios developed by Farmer Mac appropriate to its business model and portfolios, as well as any scenarios provided by the Director of OSMO. At least 15 calendar days prior to this stress testing, Farmer Mac must provide to OSMO a description of the expected and stressed scenarios that Farmer Mac intends to use to conduct its annual stress test under this section.

(B) A description of all planned capital actions over the planning horizon.

(ii) A detailed description of Farmer Mac's process for assessing capital adequacy, including:

(A) A discussion of how Farmer Mac will, under expected and stressed conditions, maintain capital commensurate with its risks, maintain capital above the minimum core capital and regulatory capital ratios and above the Tier 1 ratio set in accordance with a well-articulated risk tolerance policy established by the board of directors;

(B) A discussion of how Farmer Mac will, under expected and stressed conditions, maintain sufficient capital to continue its operations by maintaining ready access to funding, meeting its obligations to creditors and other counterparties, and continuing to serve its statutory purposes; and

(C) A discussion of the results of the risk-based stress test required by section 8.32 of the Act and the stress tests required by this section, as well as any other stress test required by law or regulation, and an explanation of how the capital plan takes these results into account.

(iii) Farmer Mac's capital policy; and

(iv) A discussion of any expected changes to Farmer Mac's business plan that are likely to have a material impact on the Corporation's capital adequacy or liquidity.

(d) *Review of capital plan by OSMO.* (1) OSMO will consider the following factors in reviewing Farmer Mac's capital plan:

(i) The comprehensiveness of the capital plan, including the extent to which the analysis underlying the capital plan captures and addresses risks stemming from activities across Farmer Mac's business lines and operations;

(ii) The reasonableness of Farmer Mac's assumptions and analysis underlying the capital plan and its methodologies for reviewing the robustness of its capital adequacy process; and

(iii) Farmer Mac's ability to maintain capital above the minimum core capital and regulatory capital ratios and above a Tier 1 ratio set in accordance with a risk tolerance policy established by the board of directors on a pro forma basis under expected and stressful conditions throughout the planning horizon, including but not limited to any stressed scenarios required under paragraphs (c)(2)(i)(A) and (c)(2)(ii) of this section.

(iv) All supervisory information about Farmer Mac and its subsidiaries;

(v) Farmer Mac's regulatory and financial reports, as well as supporting data that would allow for an analysis of its loss, revenue, and projections;

(vi) As applicable, OSMO's own pro forma estimates of Farmer Mac's potential losses, revenues, and resulting capital adequacy measurements under expected and stressful conditions, including but not limited to any stressed scenarios required under paragraphs (c)(2)(i)(A) and (c)(2)(ii) of this section, as well as the results of any other stress tests conducted by Farmer Mac or OSMO; and

(vii) Other information requested or required by OSMO, as well as any other information relevant to Farmer Mac's capital adequacy.

(e) *OSMO action on a capital plan.* (1) OSMO will review the capital plan and provide an assessment to Farmer Mac of the capital adequacy and planning process through its ongoing examination and oversight process.

(2) Upon a request by OSMO, Farmer Mac must provide OSMO with sufficient information regarding its planning assumptions, stress test strategies and results and any other relevant qualitative or quantitative information requested by OSMO to facilitate review of Farmer Mac's capital plan under this section.

(3) OSMO may require Farmer Mac to revise and re-submit its capital plan.

(f) *Farmer Mac response to OSMO's assessment.* Regardless of whether re-submission is required, Farmer Mac must take the results of the stress tests conducted under paragraphs (c)(2)(i)(A) and (c)(2)(ii) of this section (including any revisions required under paragraph (e)(3) of this section) as well as OSMO's assessment into account in making changes, as appropriate, to Farmer Mac's capital structure (including the level and composition of capital); its exposures, concentrations, and risk positions; any plans for recovery and resolution; and to improve overall risk management. Farmer Mac must document in writing its actions in response to the stress tests and assessment, as well as decisions not to take actions in response to any issues raised in the assessment.

[78 FR 65149, Oct. 31, 2013]

§ 652.62 Notice to OSMO of capital distributions.

(a) Farmer Mac must provide OSMO with notice 15 calendar days prior to a board consideration of a declaration of a capital distribution or any material changes in capital distributions policies.

(b) Except as provided in paragraph (c), notice under paragraph (a) of this section is not required with respect to capital distributions set forth (*i.e.*, specifically scheduled as to amount and timing along with a discussion of the planned distribution) in the capital plan or a regular periodic payment of dividends on common stock and preferred stock when there is no change in the amount of payment per share from the previous period.

(c) In the event that OSMO determines a capital plan has not adequately taken into account OSMO's assessment as required under § 652.61(f), the exception described in paragraph (b) of this section shall not apply, and Farmer Mac must provide notification of any and all capital distributions as set forth in paragraph (a) of this section.

[78 FR 65149, Oct. 31, 2013]

§ 652.65 Risk-based capital stress test.

You will perform the risk-based capital stress test as described in summary form below and as described in detail in appendix A to this subpart. The risk-based capital stress test spreadsheet is also available electronically at *http://www.fca.gov*. The risk-based capital stress test has five components:

(a) *Data requirements*. You will use the following data to implement the risk-based capital stress test.

(1) You will use Corporation loan-level data to implement the credit risk component of the risk-based capital stress test.

(2) You will use Call Report data as the basis for Corporation data over the 10-year stress period supplemented with your interest rate risk measurements and tax data.

(3) You will use other data, including the 10-year Constant Maturity Treasury (CMT) rate and the applicable Internal Revenue Service corporate income tax schedule, as further described in appendix A to this subpart.

(b) *Credit risk*. The credit risk part estimates loan losses during a period of sustained economic stress.

(1) For each loan in the Farmer Mac I portfolio, you will determine a default probability by using the logit functions specified in appendix A to this subpart with each of the following variables:

(i) Borrower's debt-to-asset ratio at loan origination;

(ii) Loan-to-value ratio at origination, which is the loan amount divided by the value of the property;

(iii) Debt-service-coverage ratio at origination, which is the borrower's net income (on- and off-farm) plus depreciation, capital lease payments, and interest, less living expenses and income taxes, divided by the total term debt payments;

(iv) The origination loan balance stated in 1997 dollars based on the consumer price index; and,

(v) The worst-case percentage change in farmland values (23.52 percent).

(2) You will then calculate the loss rate by multiplying the default probability for each loan by the estimated loss-severity rate, which is the average loss of the defaulted loans in the data set (20.9 percent).

(3) You will calculate losses by multiplying the loss rate by the origination loan balances stated in 1997 dollars.

(4) You will adjust the losses for loan seasoning, based on the number of years since loan origination, according to the functions in appendix A to this subpart.

(5) You will calculate loss rates on rural utility loans as further described in appendix A.

(6) You will further adjust losses for loans that collateralize the general obligation of AgVantage Plus volume, and for loans where the program loan counterparty retains a subordinated interest in accordance with appendix A to this subpart.

(7) The losses must be applied in the risk-based capital stress test as specified in appendix A to this subpart.

(c) *Interest rate risk*. (1) During the first year of the stress period, you will adjust interest rates for two scenarios, an increase in rates and a decrease in rates. You must determine your risk-based capital level based on whichever scenario would require more capital.

(2) You will calculate the interest rate stress based on changes to the quarterly average of the 10-year CMT. The starting rate is the 3-month average of the most recent CMT monthly rate series. To calculate the change in

the starting rate, determine the average yield of the preceding 12 monthly 10-year CMT rates. Then increase and decrease the starting rate by:

(i) 50 percent of the 12-month average if the average rate is less than 12 percent; or

(ii) 600 basis points if the 12-month average rate is equal to or higher than 12 percent.

(3) Following the first year of the stress period, interest rates remain at the new level for the remainder of the stress period.

(4) You will apply the interest rate changes scenario as indicated in appendix A to this subpart.

(5) You may use other interest rate indices in addition to the 10-year CMT subject to our concurrence, but in no event can your risk-based capital level be less than that determined by using only the 10-year CMT.

(d) *Cashflow generator*. (1) You must adjust your financial statements based on the credit risk inputs and interest rate risk inputs described above to generate pro forma financial statements for each year of the 10-year stress test. The cashflow generator produces these financial statements. You may use the cashflow generator spreadsheet that is described in appendix A to this subpart and available electronically at *http://www.fca.gov*. You may also use any reliable cashflow program that can develop or produce pro forma financial statements using generally accepted accounting principles and widely recognized financial modeling methods, subject to our concurrence. You may disaggregate financial data to any greater degree than that specified in appendix A to this subpart, subject to our concurrence.

(2) You must use model assumptions to generate financial statements over the 10-year stress period. The major assumption is that cashflows generated by the risk-based capital stress test are based on a steady-state scenario. To implement a steady-state scenario, when on- and off-balance sheet assets and liabilities amortize or are paid down, you must replace them with similar assets and liabilities (AgVantage Plus volume is not replaced when it matures). Replace amortized assets from discontinued loan programs with current loan programs. In general, keep assets with small balances in constant proportions to key program assets.

(3) You must simulate annual pro forma balance sheets and income statements in the risk-based capital stress test using Farmer Mac's starting position, the credit risk and interest rate risk components, resulting cashflow outputs, current operating strategies and policies, and other inputs as shown in appendix A to this subpart and the electronic spreadsheet available at *http://www.fca.gov*.

(e) *Calculation of capital requirement*. The calculations that you must use to solve for the starting regulatory capital amount are shown in appendix A to this subpart and in the electronic spreadsheet available at *http://www.fca.gov*.

[71 FR 77253, Dec. 26, 2006, as amended at 73 FR 31940, June 5, 2008; 76 FR 23467, Apr. 27, 2011]

§ 652.70 Risk-based capital level.

The risk-based capital level is the sum of the following amounts:

(a) *Credit and interest rate risk*. The amount of risk-based capital determined by the risk-based capital test under § 652.65.

(b) *Management and operations risk*. Thirty (30) percent of the amount of risk-based capital determined by the risk-based capital test in § 652.65.

§ 652.75 Your responsibility for determining the risk-based capital level.

(a) You must determine your risk-based capital level using the procedures in this subpart, appendix A to this subpart, and any other supplemental instructions provided by us. You will report your determination to us as prescribed in § 652.90. At any time, however, we may determine your risk-based capital level using the procedures in § 652.65 and appendix A to this subpart, and you must hold risk-based capital in the amount we determine is appropriate.

(b) You must at all times comply with the risk-based capital levels established by the risk-based capital stress test and must be able to determine your risk-based capital level at any time.

(c) If at any time the risk-based capital level you determine is less than the minimum capital requirements set forth in section 8.33 of the Act, you must maintain the statutory minimum capital level.

§ 652.80 When you must determine the risk-based capital level.

(a) You must determine your risk-based capital level at least quarterly, or whenever changing circumstances occur that have a significant effect on capital, such as exposure to a high volume of, or particularly severe, problem loans or a period of rapid growth.

(b) In addition to the requirements of paragraph (a) of this section, we may require you to determine your risk-based capital level at any time.

(c) If you anticipate entering into any new business activity that could have a significant effect on capital, you must determine a pro forma risk-based capital level, which must include the new business activity, and report this pro forma determination to the Director, Office of Secondary Market Oversight, at least 10-business days prior to implementation of the new business program.

§ 652.85 When to report the risk-based capital level.

(a) You must file a risk-based capital report with us each time you determine your risk-based capital level as required by § 652.80.

(b) You must also report to us at once if you identify in the interim between quarterly or more frequent reports to us that you are not in compliance with the risk-based capital level required by § 652.70.

(c) If you make any changes to the data used to calculate your risk-based capital requirement that cause a material adjustment to the risk-based capital level you reported to us, you must file an amended risk-based capital report with us within 5-business days after the date of such changes;

(d) You must submit your quarterly risk-based capital report for the last day of the preceding quarter by the earlier of the reporting deadlines for Securities and Exchange Commission Forms 10–K and 10–Q, or the 40th day after each of the quarters ending March 31st, June 30th, and September 30th, and the 75th day after the quarter ending on December 31st.

[71 FR 77253, Dec. 26, 2006, as amended at 73 FR 31940, June 5, 2008]

§ 652.90 How to report your risk-based capital determination.

(a) Your risk-based capital report must contain at least the following information:

(1) All data integral for determining the risk-based capital level, including any business policy decisions or other assumptions made in implementing the risk-based capital test;

(2) Other information necessary to determine compliance with the procedures for determining risk-based capital as specified in appendix A to this subpart; and

(3) Any other information we may require in written instructions to you.

(b) You must submit each risk-based capital report in such format or medium, as we require.

§ 652.95 Failure to meet capital requirements.

(a) *Determination and notice.* At any time, we may determine that you are not meeting your risk-based capital level calculated according to § 652.65, your minimum capital requirements specified in section 8.33 of the Act, or your critical capital requirements specified in section 8.34 of the Act. We will notify you in writing of this fact and the date by which you should be in compliance (if applicable).

(b) *Submission of capital restoration plan.* Our determination that you are not meeting your required capital levels may require you to develop and submit to us, within a specified time period, an acceptable plan to reach the appropriate capital level(s) by the date required.

§ 652.100 Audit of the risk-based capital stress test.

You must have a qualified, independent external auditor review your implementation of the risk-based capital stress test every 3 years and submit a copy of the auditor's opinion to us.

APPENDIX A TO SUBPART B OF PART 652—RISK-BASED CAPITAL STRESS TEST

1.0 Introduction.
2.0 Credit Risk.
2.1 Loss-Frequency and Loss-Severity Models for All Types of Loans, Except Rural Utility Loans.
2.2 Loan-Seasoning Adjustment for All Types of Loans, Except Rural Utility Loans.
2.3 Example Calculation of Dollar Loss on One Loan for All Types of Loans, Except Rural Utility Loans.
2.4 Treatment of Loans Backed by an Obligation of the Counterparty and Loans for Which Pledged Loan Collateral Volume Exceeds Farmer Mac-Guaranteed Volume.
2.5 Calculation of Loss Rates for Use in the Stress Test for All Types of Loans, Except Rural Utility Loans.
2.6 Calculation of Loss Rates on Rural Utility Volume for Use in the Stress Test.
3.0 Interest Rate Risk.
3.1 Process for Calculating the Interest Rate Movement.
4.0 Elements Used in Generating Cashflows.
4.1 Data Inputs.
4.2 Assumptions and Relationships.
4.3 Risk Measures.
4.4 Loan and Cashflow Accounts.
4.5 Income Statements.
4.6 Balance Sheets.
4.7 Capital.
5.0 Capital Calculations.
5.1 Method of Calculation.

1.0 INTRODUCTION

a. Appendix A provides details about the risk-based capital stress test (stress test) for Farmer Mac. The stress test calculates the risk-based capital level required by statute under stipulated conditions of credit risk and interest rate risk. The stress test uses loan-level data from Farmer Mac's agricultural mortgage portfolio or proxy data as described in section 4.1 d.(3) below, as well as quarterly Call Report and related information to generate pro forma financial statements and calculate a risk-based capital requirement. The stress test also uses historic agricultural real estate mortgage performance data, rural utility guarantee fees, relevant economic variables, and other inputs in its calculations of Farmer Mac's capital needs over a 10-year period.

b. Appendix A establishes the requirements for all components of the stress test. The key components of the stress test are: Specifications of credit risk, interest rate risk, the cashflow generator, and the capital calculation. Linkages among the components ensure that the measures of credit and interest rate risk pass into the cashflow generator. The linkages also transfer cashflows through the financial statements to represent values of assets, liabilities, and equity capital. The 10-year projection is designed to reflect a steady state in the scope and composition of Farmer Mac's assets.

2.0 CREDIT RISK

Loan loss rates are determined by applying the loss-frequency equation and the loss-severity factor to Farmer Mac loan-level data. Using this equation and severity factor, you must calculate loan losses under stressful economic conditions assuming Farmer Mac's portfolio remains at a ''steady state.'' Steady state assumes the underlying characteristics and risks of Farmer Mac's portfolio remain constant over the 10 years of the stress test. Loss rates discussed in this section apply to all loans, unless otherwise indicated. Loss rates are computed from estimated dollar losses for use in the stress test. The loan volume subject to loss throughout the stress test is then multiplied by the loss rate. Lastly, the stress test allocates losses to each of the 10 years assuming a time pattern for loss occurrence as discussed in section 4.3, ''Risk Measures.''

2.1 Loss-Frequency and Loss-Severity Models for All Types of Loans, Except Rural Utility Loans

a. Credit risks are modeled in the stress test using historical time series loan-level data to measure the frequency and severity of losses on agricultural mortgage loans. The model relates loss frequency and severity to loan-level characteristics and economic conditions through appropriately specified regression equations to account explicitly for the effects of these characteristics on loan losses. Loan losses for Farmer Mac are estimated from the resulting loss-frequency equation combined with the loss-severity factor by substituting the respective values of Farmer Mac's loan-level data or proxy data as described in section 4.1 d.(3) below, and applying stressful economic inputs.

b. The loss-frequency equation and loss-severity factor were estimated from historical agricultural real estate mortgage loan data from the Farm Credit Bank of Texas (FCBT). Due to Farmer Mac's relatively short history, its own loan-level data are insufficiently developed for use in estimating the default frequency equation and loss-severity factor. In the future, however, expansions in both the scope and historic length of Farmer Mac's lending operations may support the use of its data in estimating the relationships.

c. To estimate the equations, the data used included FCBT loans, which satisfied three of the four underwriting standards Farmer Mac currently uses (estimation data). The four standards specify: (1) The debt-to-assets ratio (D/A) must be less than 0.50, (2) the loan-to-value ratio (LTV) must be less than 0.70, (3) the debt-service-coverage ratio

(DSCR) must exceed 1.25, (4) and the current ratio (current assets divided by current liabilities) must exceed 1.0. Furthermore, the D/A and LTV ratios were restricted to be less than or equal to 0.85.

d. Several limitations in the FCBT loan-level data affect construction of the loss-frequency equation. The data contained loans that were originated between 1979 and 1992, but there were virtually no losses during the early years of the sample period. As a result, losses attributable to specific loans are only available from 1986 through 1992. In addition, no prepayment information was available in the data.

e. The FCBT data used for estimation also included as performing loans, those loans that were re-amortized, paid in full, or merged with a new loan. Including these loans may lead to an understatement of loss-frequency probabilities if some of the re-amortized, paid, or merged loans experience default or incur losses. In contrast, when the loans that are re-amortized, paid in full, or merged are excluded from the analysis, the loss-frequency rates are overstated if a higher proportion of loans that are re-amortized, paid in full, or combined (merged) into a new loan are non-default loans compared to live loans.[1]

f. The structure of the historical FCBT data supports estimation of loss frequency based on origination information and economic conditions. Under an origination year approach, each observation is used only once in estimating loan default. The underwriting variables at origination and economic factors occurring over the life of the loan are then used to estimate loan-loss frequency.

g. The final loss-frequency equation is based on origination year data and represents a lifetime loss-frequency model. The final equation for loss frequency is:

$$p = 1/(1 + \exp(-(BX))$$

Where:

$$BX = (-12.62738) + 1.91259 \cdot X_1 + (-0.33830) \cdot X_2 / (1 + 0.0413299)^{Periods} + (-0.19596) \cdot X_3 + 4.55390 \cdot (1-\exp((-0.00538178) \cdot X_4) + 2.49482 \cdot X_5$$

Where:

- p is the probability that a loan defaults and has positive losses (Pr (Y = 1 | x));
- X_1 is the LTV ratio at loan origination raised to the power 5.3914596;[2]
- X_2 is the largest annual percentage decline in FCBT farmland values during the life of the loan dampened with a factor of 0.0413299 per year;[3]
- X_3 is the DSCR at loan origination;
- X_4 is 1 minus the exponential of the product of negative 0.00538178 and the original loan balance in 1997 dollars expressed in thousands; and
- X_5 is the D/A ratio at loan origination.

h. The estimated logit coefficients and p-values are:[4]

	Coefficients	p-value
Intercept	−12.62738	<0.0001
X_1: LTV variable	1.91259	0.0001
X_2: Max land value decline variable	0.33830	<0.0001
X_3: DSCR	−0.19596	0.0002
X_4: Loan size variable	4.55390	<0.0001

[1] Excluding loans with defaults, 11,527 loans were active and 7,515 loans were paid in full, re-amortized or merged as of 1992. A t-test[2] of the differences in the means for the group of defaulted loans and active loans indicated that active loans had significantly higher D/A and LTV ratios, and lower current ratios than defaulted loans where loss occurred. These results indicate that, on average, active loans have potentially higher risk than loans that were re-amortized, paid in full, or merged.

[2] Loss probability is likely to be more sensitive to changes in LTV at higher values of LTV. The power function provides a continuous relationship between LTV and defaults.

[3] The dampening function reflects the declining effect that the maximum land value decline has on the probability of default when it occurs later in a loan's life.

[4] The nonlinear parameters for the variable transformations were simultaneously estimated using SAS version 8e NLIN procedure. The NLIN procedure produces estimates of the parameters of a nonlinear transformation for LTV, dampening factor, and loan-size variables. To implement the NLIN procedure, the loss-frequency equation and its variables are declared and initial parameter values supplied. The NLIN procedure is an iterative process that uses the initial parameter values as the starting values for the first iteration and continues to iterate until acceptable parameters are solved. The initial values for the power function and dampening function are based on the proposed rule. The procedure for the initial values for the size variable parameter is provided in an Excel spreadsheet posted at *http://www.fca.gov*. The Gauss-Newton method is the selected iterative solving process. As described in the preamble, the loss-frequency function for the nonlinear model is the negative of the log-likelihood function, thus producing maximum likelihood estimates. In order to obtain statistical properties for the loss-frequency equation and verify the logistic coefficients, the estimates for the nonlinear transformations are applied to the FCBT data and the loss-frequency model is re-estimated using the SAS Logistic procedure. The SAS procedures, output reports and Excel spreadsheet used to estimate the parameters of the loss-frequency equation are located on the Web site *http://www.fca.gov*.

	Coefficients	p-value
X_5: D/A ratio	2.49482	<0.0000

i. The low p-values on each coefficient indicate a highly significant relationship between the probability ratio of loan-loss frequency and the respective independent variables. Other goodness-of-fit indicators are:

Hosmer and Lemeshow goodness-of-fit p-value	0.1718
Max-rescaled R^2	0.2015
Concordant	85.2%
Disconcordant	12.0%
Tied	2.8%

j. These variables have logical relationships to the incidence of loan default and loss, as evidenced by the findings of numerous credit-scoring studies in agricultural finance.[5] Each of the variable coefficients has directional relationships that appropriately capture credit risk from underwriting variables and, therefore, the incidence of loan-loss frequency. The frequency of loan loss was found to differ significantly across all of the loan characteristics and lending conditions. Farmland values represent an appropriate variable for capturing the effects of exogenous economic factors. It is commonly accepted that farmland values at any point in time reflect the discounted present value of expected returns to the land.[6] Thus, changes in land values, as expressed in the loss-frequency equation, represent the combined effects of the level and growth rates of farm income, interest rates, and inflationary expectations—each of which is accounted for in the discounted, present value process.

k. When applying the equation to Farmer Mac's portfolio, you must get the input values for X_1, X_3, X_4, and X_5 for each loan in Farmer Mac's portfolio on the date at which the stress test is conducted, using either submitted data or proxy data as described in section 4.1 d.(3) below. For the variable X_2, the stressful input value from the benchmark loss experience is −23.52 percent. You must apply this input to all Farmer Mac loans subject to loss to calculate loss frequency under stressful economic conditions.[7] The maximum land value decline from the benchmark loss experience is the simple average of annual land value changes for Iowa, Illinois, and Minnesota for the years 1984 and 1985.[8]

l. Forecasting with data outside the range of the estimation data requires special treatment for implementation. While the estimation data embody Farmer Mac values for various loan characteristics, the maximum farmland price decline experienced in Texas was −16.69 percent, a value below the benchmark experience of −23.52 percent. To control for this effect, you must apply a procedure that restricts the slope of all the independent variables to that observed at the maximum land value decline observed in the estimation data. Essentially, you must approximate the slope of the loss-frequency equation at the point −16.69 percent in order to adjust the probability of loan default and loss occurrence for data beyond the range in the estimating data. The adjustment procedure is shown in step 4 of section 2.3 entitled, ''Example Calculation of Dollar Loss on One Loan.''

m. Loss severity was not found to vary systematically and was considered constant across the tested loan characteristics and lending conditions. Thus, the simple weighted average by loss volume of 20.9 percent is used in the stress test.[9] You must multiply loss severity with the probability estimate computed from the loss-frequency equation to determine the loss rate for a loan.

n. Using original loan balance results in estimated probabilities of loss frequency over the entire life of a loan. To account for loan seasoning, you must reduce the loan-loss exposure by the cumulative probability of loss already experienced by each loan as discussed in section 2.2 entitled, ''Loan-Seasoning Adjustment.'' This subtraction is based on loan age and reduces the loss estimated by the loss-frequency and loss-severity equations. The result is an age-adjusted lifetime dollar loss that can be used in subsequent calculations of loss rates as discussed in section 2.4, ''Calculation of Loss Rates for Use in the Stress Test.''

2.2 Loan-Seasoning Adjustment for All Types of Loans, Except Rural Utility Loans

a. You must use the seasoning function supplied by FCA to adjust the calculated probability of loss for each Farmer Mac loan for the cumulative loss exposure already experienced based on the age of each loan. The seasoning function is based on the same data used to determine the loss-frequency equation and an assumed average life of 14 years

[5] Splett, N.S., P. J. Barry, B. Dixon, and P. Ellinger. ''A Joint Experience and Statistical Approach to Credit Scoring,'' *Agricultural Finance Review*, 54(1994):39–54.

[6] Barry, P. J., P. N. Ellinger, J. A. Hopkin, and C. B. Baker. *Financial Management in Agriculture*, 5th ed., Interstate Publishers, 1995.

[7] On- and off-balance sheet Farmer Mac I agricultural mortgage program assets booked after the 1996 Act amendments are subject to the loss calculation.

[8] While the worst-case losses, based on origination year, occurred during 1983 and 1984, this benchmark was determined using annual land value changes that occurred 2 years later.

[9] We calculated the weighted-average loss severity from the estimation data.

for agricultural mortgages. If we determine that the relationship between the loss experience in Farmer Mac's portfolio over time and the seasoning function can be improved, we may augment or replace the seasoning function.

b. The seasoning function is parameterized as a beta distribution with parameters of p = 4.288 and q = 5.3185.[10] How the loan-seasoning distribution is used is shown in Step 7 of section 2.3, ''Example Calculation of Dollar Loss on One Loan.''

2.3 Example Calculation of Dollar Loss on One Loan for All Types of Loans, Except Rural Utility Loans

Here is an example of the calculation of the dollar losses for an individual loan with the following characteristics and input values:[11]

Loan Origination Year	1996
Loan Origination Balance ..	$1,250,000
LTV at Origination	0.5
D/A at Origination	0.5
DSCR at Origination	1.3984
Maximum Percentage Land Price Decline (MAX)	−23.52

Step 1: Convert 1996 Origination Value to 1997 dollar value (LOAN) based on the consumer price index and transform as follows:

$1,278,500 = $1,250,000 · 1.0228

0.998972 = 1 − exp((−.00538178) · $1,278,500 / 1000)

Step 2: Calculate the default probabilities using −16.64 percent and −16.74 percent land value declines as follows:[12]

Where:

Z_1 = (−12.62738) + 1.91259 · $LTV^{5.3914596}$ − 0.33830 · (−16.6439443) − 0.19596 · DSCR + 4.55390 · 0.998972 + 2.49482 · DA = (−1.428509)

Default Loss Frequency at (−16.64%) =

$1 / 1 + \exp^{-(-1.428509)} = 0.19333111$

And

Z_1 = (−12.62738) + 1.91259 · $LTV^{5.3914596}$ − 0.33830 · (−16.7439443) − 0.19596 · DSCR + 4.55390 · 0.998972 + 2.49482 · DA = (−1.394679)

Loss Frequency Probability at (−16.74%) =

$1 / 1 + \exp^{-(-1.394679)} = 0.19866189$

Step 3: Calculate the slope adjustment. You must calculate slope by subtracting the difference between ''Loss-Frequency Probability at −16.64 percent'' and ''Loss-Frequency Probability at −16.74 percent'' and dividing by −0.1 (the difference between −16.64 percent and −16.74 percent) as follows:

0.05330776 = (0.19333111 − 0.19866189) / −0.1

Step 4: Make the linear adjustment. You make the adjustment by increasing the loss-frequency probability where the dampened stressed farmland value input is less than −16.69 percent to reflect the stressed farmland value input, appropriately discounted. As discussed previously, the stressed land value input is discounted to reflect the declining effect that the maximum land value decline has on the probability of default when it occurs later in a loan's life.[13] The linear adjustment is the difference between −16.69 percent land value decline and the adjusted stressed maximum land value decline input of −23.52 multiplied by the slope estimated in Step 3 as follows:

Loss Frequency at −16.69 percent =

Z_1 = (−12.62738) + (1.91259)($LTV^{5.3914596}$) − (0.33830)(−16.6939443) − (0.19596)(DSCR) + (4.55390)(0.998972) + (2.49482)(DA) = −1.411594

And

$1 / 1 + \exp^{-(-1.411594)} = 0.19598279$

Dampened Maximum Land Price Decline = (−20.00248544) = $(-23.52)(1.0413299)^{-4}$

Slope Adjustment = 0.17637092 = 0.053312247 · (−16.6939443 − (−20.00248544))

Loan Default Probability = 0.37235371 = 0.19598279 + 0.17637092

Step 5: Multiply loan default probability times the average severity of 0.209 as follows:

0.077821926 = 0.37235371 · 0.209

Step 6: Multiply the loss rate times the origination loan balance as follows:

$97,277 = $1,250,000 · 0.077821926

Step 7: Adjust the origination based dollar losses for 4 years of loan seasoning as follows:

$81,987 = $97,277 − $97,277 · (0.157178762)[14]

[10] We estimated the loan-seasoning distribution from portfolio aggregate charge-off rates from the estimation data. To do so, we arrayed all defaulting loans where loss occurred according to the time from origination to default. Then, a beta distribution, β(p, q), was fit to the estimation data scaled to the maximum time a loan survived (14 years).

[11] In the examples presented we rounded the numbers, but the example calculation is based on a larger number of significant digits. The stress test uses additional digits carried at the default precision of the software.

[12] This process facilitates the approximation of slope needed to adjust the loss probabilities for land value declines greater than observed in the estimation data.

[13] The dampened period is the number of years from the beginning of the origination year to the current year (i.e., January 1, 1996 to January 1, 2000 is 4 years).

[14] The age of adjustment of 0.157178762 is determined from the beta distribution for a 4-year-old loan.

2.4 Treatment of Loans Backed by an Obligation of the Counterparty and Loans for Which Pledged Loan Collateral Volume Exceeds Farmer Mac-Guaranteed Volume

You must calculate the age-adjusted loss rates for these loans that include adjustments to scale losses according to the proportion of total submitted collateral to the guaranteed amount as provided for in the ''Dollar Losses'' column of the transformed worksheets in the Credit Loss Module based on new data inputs required in the ''Coefficients'' worksheet of the Credit Loss Module. Then, you must adjust the calculated loss rates as follows.

a. For loans in which the seller retains a subordinated interest, subtract from the total estimated age-adjusted dollar losses on the pool the amount equal to current unpaid principal times the subordinated interest percentage.

b. Some pools of loans underlying specific transactions could include loan collateral volume pledged to Farmer Mac in excess of Farmer Mac's guarantee amount (''overcollateral''). Overcollateral can be either: (i) Contractually required according to the terms of the transaction, or (ii) not contractually required, but pledged in addition to the contractually required amount at the discretion of the counterparty, often for purposes of administrative convenience regarding the collateral substitution process, or (iii) both (i) and (ii).

1. If a pool of loans includes collateral pledged in excess of the guaranteed amount, you must adjust the age-adjusted, loan-level dollar losses by a factor equal to the ratio of the guarantee amount to total submitted collateral. For example, consider a pool of two loans serving as security for a Farmer Mac guarantee on a note with a total issuance face value of $2 million and on which the counterparty has submitted 10-percent overcollateral. The two loans in the example have the following characteristics and adjustments.

Loan	Origination balance	Age-adjusted loss rate (percent)	Estimated age-adjusted losses	Guarantee amount scaling adjustment (2/2.2) (Percent)	Losses adjusted for overcollateral
1	$1,080,000	7.0	$75,600	90.91	$68,727
2	1,120,000	5.0	56,000	90.91	50,909

2. If a pool of loans includes collateral pledged in excess of the guaranteed amount that is required under the terms of the transaction, you must further adjust the dollar losses as follows. Calculate the total losses on the subject portfolio of loans after age adjustments and any adjustments related to total submitted overcollateral as described in ''1.'' above. Calculate the total dollar amount of contractually required overcollateral in the subject pool. Subtract the total dollars of contractually required overcollateral from the adjusted total losses on the subject pool. If the result is less than or equal to zero, input a loss rate of zero for this transaction pool in the Data Inputs worksheet of the RBCST. A new category must be created for each such transaction in the RBCST. If the loss rate after subtracting contractually required overcollateral is greater than zero, proceed to additional adjustment for the risk-reducing effects of the counterparty's general obligation described in ''3.'' below.

3. Loans with a positive loss estimate remaining after adjustments in ''1.'' and ''2.'' above are further adjusted for the security provided by the general obligation of the counterparty. To make this adjustment in our example, multiply the estimated dollar losses remaining after adjustments in ''1.'' and ''2.'' above by the appropriate general obligation adjustment (GOA) factor based on the counterparty's whole-letter issuer credit rating by a nationally recognized statistical rating organization (NRSRO) and the ratio of the counterparty's concentration of risk in the same industry sector as the loans backing the AgVantage Plus volume, as determined by the Director.

A. The Director will make final determinations of concentration ratios on a case-by-case basis by using publicly reported data on counterparty portfolios, non-public data submitted and certified by Farmer Mac as part of its RBCST submissions, and will generally recognize rural electric cooperatives and rural telephone cooperatives as separate rural utility sectors. The following table sets forth the GOA factors and their components by whole-letter credit rating (Adjustment Factor = Default Rate × Severity Rate × 3), which may be further adjusted for industry sector concentration by the Director.[15]

[15] Emery, K., Ou S., Tennant, J., Kim F., Cantor R., ''Corporate Default and Recovery Rates, 1920—2007,'' published by Moody's Investors Service, February 2008—the most recent edition as of March 2008; Default Rates, page 24, Recovery Rates (Severity Rate = 1 minus Senior Unsecured Average Recovery Rate) page 20.

A	B	C	D	E	F	G
Whole-letter rating	Default rate (percent)	Severity rate (percent)	V3.0 GOA factor (percent)	V4.0 GOA factors (D × 3) (percent)	Concentration ratio (e.g., 25%) (percent)	Factor with concentration adjustment 1 − ((1 − E) × (1 − F)) (percent)
AAA	0.897	54	0.48	1.41	25.00	26.06
AA	2.294	54	1.24	3.70	25.00	27.78
A	2.901	54	1.57	5.13	25.00	28.84
BBB	7.061	54	3.82	11.48	25.00	33.61
Below BBB and Unrated	26.827	54	14.50	44.52	25.00	58.39

B. The adjustment factors will be updated annually as Moody's annual report on Default and Recovery Rates of Corporate Bond Issuers becomes available, normally in January or February of each year. In the event that there is an interruption of Moody's publication of this annual report, or FCA determines that the format of the report has changed enough to prevent or call into question the identification of updated factors, the prior year's factors will remain in effect until FCA revises the process through rulemaking.

4. Continuing the previous example, the pool contains two loans on which Farmer Mac is guaranteeing a total of $2 million and with total submitted collateral of 110 percent of the guaranteed amount. Of the 10-percent total overcollateral, 5 percent is contractually required under the terms of the transaction. The pool consists of two loans of slightly over $1 million. Total overcollateral is $200,000 of which $100,000 is contractually required. The counterparty has a single ''A'' credit rating, a 25-percent concentration ratio, and after adjusting for contractually required overcollateral, estimated losses are greater than zero. The net loss rate is calculated as described in the steps in the table below.

	Loan A	Loan B
1 Guaranteed Volume	$2,000,000	
2 Origination Balance of 2-Loan Portfolio	$1,080,000	$1,120,000
3 Age-Adjusted Loss Rate	7%	5%
4 Estimated Age-Adjusted Losses	$75,600	$56,000
5 Guarantee Volume Scaling Factor	90.91%	90.91%
6 Losses Adjusted for Total Overcollateral	$68,727	$50,909
7 Contractually Required Overcollateral on Pool (5%)	$100,000	
8 Net Losses on Pool Adjusted for Contractually Required Overcollateral.	$19,636	
9 GOA Factor for ''A'' Issuer with 25% Concentration Ratio	28.84%	
10 Losses Adjusted for ''A'' General Obligation	$5,664	
11 Loss Rate Input in the RBCST for this Pool	0.28%	

A. The net, fully adjusted losses are distributed over time on a straight-line basis. When a transaction reaches maturity within the 10-year modeling horizon, the losses are distributed on a straightline over a timepath that ends in the year of the transaction's maturity.

B. [Reserved]

2.5 Calculation of Loss Rates for Use in the Stress Test for All Types of Loans, Except Rural Utility Loans

a. You must compute the loss rates by state as the dollar weighted average seasoned loss rates from the Cash Window and Standby loan portfolios by state. The spreadsheet entitled, ''Credit Loss Module.XLS'' can be used for these calculations. This spreadsheet is available for download on our Web site, *www.fca.gov*, or will be provided upon request. The blended loss rates for each state are copied from the ''Credit Loss Module'' to the stress test spreadsheet for determining Farmer Mac's regulatory capital requirement.

b. The stress test use of the blended loss rates is further discussed in section 4.3, ''Risk Measures.''

2.6 Calculation of Loss Rates on Rural Utility Volume for-Use in the Stress Test

You must submit the outstanding principal, maturity date of the loan, maturity date of the AgVantage Plus contract (if applicable), and the rural utility guarantee fee percentage for each loan in Farmer Mac's

rural utility loan portfolio on the date at which the stress test is conducted. You must multiply the rural utility guarantee fee by two to calculate the loss rate on rural utility loans under stressful economic conditions and then multiply the loss rate by the total outstanding principal. To arrive at the net rural utility loan losses, you must next apply the steps ''5'' through ''11'' of section 2.4.b.4 of this Appendix. For loans under an AgVantage Plus-type structure, the calculated losses are distributed over time on a straight-line basis. For loans that are not part of an AgVantage Plus-type structure, losses are distributed over the 10-year modeling horizon, consistent with other non-AgVantage Plus loan volume.

3.0 Interest Rate Risk

The stress test explicitly accounts for Farmer Mac's vulnerability to interest rate risk from the movement in interest rates specified in the statute. The stress test considers Farmer Mac's interest rate risk position through the current structure of its balance sheet, reported interest rate risk shock-test results,[16] and other financial activities. The stress test calculates the effect of interest rate risk exposure through market value changes of interest-bearing assets, liabilities, and off-balance sheet transactions, and thereby the effects to equity capital. The stress test also captures this exposure through the cashflows on rate-sensitive assets and liabilities. We discuss how to calculate the dollar impact of interest rate risk in section 4.6, ''Balance Sheets.''

3.1 Process for Calculating the Interest Rate Movement

a. The stress test uses the 10-year Constant Maturity Treasury (10-year CMT) released by the Federal Reserve in HR. 15, ''Selected Interest Rates.'' The stress test uses the 10-year CMT to generate earnings yields on assets, expense rates on liabilities, and changes in the market value of assets and liabilities. For stress test purposes, the starting rate for the 10-year CMT is the 3-month average of the most recent monthly rate series published by the Federal Reserve. The 3-month average is calculated by summing the latest monthly series of the 10-year CMT and dividing by three. For instance, you would calculate the initial rate on June 30, 1999, as:

Month end	10-year CMT monthly series
04/1999	5.18
05/1999	5.54
06/1999	5.90
Average	5.54

b. The amount by which the stress test shocks the initial rate up and down is determined by calculating the 12-month average of the 10-year CMT monthly series. If the resulting average is less than 12 percent, the stress test shocks the initial rate by an amount determined by multiplying the 12-month average rate by 50 percent. However, if the average is greater than or equal to 12 percent, the stress test shocks the initial rate by 600 basis points. For example, determine the amount by which to increase and decrease the initial rate for June 30, 1999, as follows:

Month end	10-year CMT monthly series
07/1998	5.46
08/1998	5.34
09/1998	4.81
10/1998	4.53
11/1998	4.83
12/1998	4.65
01/1999	4.72
02/1999	5.00
03/1999	5.23
04/1999	5.18
05/1999	5.54
06/1999	5.90
12-Month Average	5.10

Calculation of shock amount	
12-Month Average Less than 12%	Yes.
12-Month Average	5.10.
Multiply the 12-Month Average by	50%.
Shock in basis points equals	255.

c. You must run the stress test for two separate changes in interest rates: (i) An immediate increase in the initial rate by the shock amount; and (ii) immediate decrease in the initial rate by the shock amount. The stress test then holds the changed interest rate constant for the remainder of the 10-year stress period. For example, at June 30, 1999, the stress test would be run for an immediate and sustained (for 10 years) upward movement in interest rates to 8.09 percent (5.54 percent plus 255 basis points) and also for an immediate and sustained (for 10 years) downward movement in interest rates to 2.99 percent (5.54 percent minus 255 basis points). The movement in interest rates that results in the greatest need for capital is then used to determine Farmer Mac's risk-based capital requirement.

[16] See paragraph c. of section 4.1 entitled, ''Data Inputs,'' for a description of the interest rate risk shock-reporting requirement.

4.0 ELEMENTS USED IN GENERATING CASHFLOWS

a. This section describes the elements that are required for implementation of the stress test and assessment of Farmer Mac capital performance through time. An Excel spreadsheet named FAMC RBCST, available at *http://www.fca.gov*, contains the stress test, including the cashflow generator. The spreadsheet contains the following seven worksheets:

(1) Data Input;

(2) Assumptions and Relationships;

(3) Risk Measures (credit risk and interest rate risk);

(4) Loan and Cash Flow Accounts;

(5) Income Statements;

(6) Balance Sheets; and

(7) Capital.

b. Each of the components is described in further detail below with references where appropriate to the specific worksheets within the Excel spreadsheet. The stress test may be generally described as a set of linked financial statements that evolve over a period of 10 years using generally accepted accounting conventions and specified sets of stressed inputs. The stress test uses the initial financial condition of Farmer Mac, including earnings and funding relationships, and the credit and interest rate stressed inputs to calculate Farmer Mac's capital performance through time. The stress test then subjects the initial financial conditions to the first period set of credit and interest rate risk stresses, generates cashflows by asset and liability category, performs necessary accounting postings into relevant accounts, and generates an income statement associated with the first interval of time. The stress test then uses the income statement to update the balance sheet for the end of period 1 (beginning of period 2). All necessary capital calculations for that point in time are then performed.

c. The beginning of the period 2 balance sheet then serves as the departure point for the second income cycle. The second period's cashflows and resulting income statement are generated in similar fashion as the first period's except all inputs (*i.e.*, the periodic loan losses, portfolio balance by category, and liability balances) are updated appropriately to reflect conditions at that point in time. The process evolves forward for a period of 10 years with each pair of balance sheets linked by an intervening set of cashflow and income statements. In this and the following sections, additional details are provided about the specification of the income-generating model to be used by Farmer Mac in calculating the risk-based capital requirement.

4.1 Data Inputs

The stress test requires the initial financial statement conditions and income generating relationships for Farmer Mac. The worksheet named ''Data Inputs'' contains the complete data inputs and the data form used in the stress test. The stress test uses these data and various assumptions to calculate pro forma financial statements. For stress test purposes, Farmer Mac is required to supply:

a. *Call Report Schedules RC: Balance Sheet and RI: Income Statement.* These schedules form the starting financial position for the stress test. In addition, the stress test calculates basic financial relationships and assumptions used in generating pro forma annual financial statements over the 10-year stress period. Financial relationships and assumptions are in section 4.2, ''Assumptions and Relationships.''

b. *Cashflow Data for Asset and Liability Account Categories.* The necessary cashflow data for the spreadsheet-based stress test are book value, weighted average yield, weighted average maturity, conditional prepayment rate, weighted average amortization, and weighted average guarantee fees and rural utility guarantee fees. The spreadsheet uses this cashflow information to generate starting and ending account balances, interest earnings, guarantee fees, rural utility guarantee fees, and interest expense. Each asset and liability account category identified in this data requirement is discussed in section 4.2 ''Assumptions and Relationships.''

c. *Interest Rate Risk Measurement Results.* The stress test uses the results from Farmer Mac's interest rate risk model to represent changes in the market value of assets, liabilities, and off-balance sheet positions during upward and downward instantaneous shocks in interest rates of 300, 250, 200, 150, and 100 basis points. The stress test uses these data to calculate a schedule of estimated effective durations representing the market value effects from a change in interest rates. The stress test uses a linear interpolation of the duration schedule to relate a change in interest rates to a change in the market value of equity. This calculation is described in section 4.4 entitled, ''Loan and Cashflow Accounts,'' and is illustrated in the referenced worksheet of the stress test.

d. *Loan-Level Data for all Farmer Mac I Program Assets.*

(1) The stress test requires loan-level data for all Farmer Mac I program assets to determine lifetime age-adjusted loss rates. The specific loan data fields required for running the credit risk component are:

Farmer Mac I Program Loan Data Fields

Loan Number
Ending Scheduled Balance
Group

Pre/Post Act
Property State
Product Type
Origination Date
Loan Cutoff Date
Original Loan Balance
Original Scheduled P&I
Original Appraised Value
Loan-to-Value Ratio
Debt-to-Assets Ratio
Current Assets
Current Liabilities
Total Assets
Total Liabilities
Gross Farm Revenue
Net Farm Income
Depreciation
Interest on Capital Debt
Capital Lease Payments
Living Expenses
Income & FICA Taxes
Net Off-Farm Income
Total Debt Service
Guarantee/Commitment Fee
Seasoned Loan Flag

(2) From the loan-level data, you must identify the geographic distribution by state of Farmer Mac's loan portfolio and enter the current loan balance for each state in the ''Data Inputs'' worksheet. The lifetime age-adjustment of origination year loss rates was discussed in section 2.0, ''Credit Risk.'' The lifetime age-adjusted loss rates are entered in the ''Risk Measures'' worksheet of the stress test. The stress test application of the loss rates is discussed in section 4.3, ''Risk Measures.''

(3) Under certain circumstances, described below, you must substitute the following data proxies for the variables LTV, DSCR, and D/A: LTV = 0.70, DSCR = 1.25, and D/A = 0.50. The substitution must be done whenever any of these data are missing, i.e., cells are blank, or one or more of the conditions in the following table is true.

Condition	Apply
1. Total Assets = 0	Proxy D/A.
2. Total Liabilities = 0	Proxy D/A.
3. Total assets less total liabilities <0	Proxy D/A.
4. Total debt service = 0 or not calculable	Proxy DSCR.
5. Net farm income = 0	Proxy DSCR.
6. LTV ratio = 0	Proxy LTV.
7. Total assets less than original appraised value	Proxy LTV, D/A.
8. Total liabilities less than the original loan amount	Proxy D/A.
9. Total debt service is less than original scheduled principal and interest payment	Proxy DSCR.
10. Depreciation, interest on capital debt, capital lease payments, or living expenses are reported as less than zero.	Proxy DSCR.
11. Original Scheduled Principal and Interest is greater than Total Debt Service	Proxy DSCR.
12. Calculated LTV (original loan amount divided by original appraised value) does not equal the submitted LTV ratio.	The greater of the two LTV ratios.
13. Any of the fields referenced in ''1.'' through ''12.'' above are blank or contain spaces, periods, zeros, negative amounts, or fonts formatted to any setting other than numbers.	Proxy all related ratios.

In addition, the following loan data adjustments must be made in response to the situations listed below:

Situation	Data adjustment
Original loan balance is less than scheduled loan balance	Substitute scheduled balance for origination.
Purchase (commitment) date (a.k.a. ''cutoff'' date) field and Origination date field are both blank.	Insert the quarter end ''as of'' date of the RBCST submission.
Origination date field is blank	Model based on Cutoff date.
Seasoned Standby loans that include loan data	Proxy data applied.*

*Application of proxy data recognizes that underwriting data on seasoned Standby loans are not reviewed by Farmer Mac in favor of other criteria and frequently not origination data.

Further, because it would not be possible to compile an exhaustive list of loan data anomalies, FCA reserves the authority to require an explanation on other data anomalies it identifies and to apply the loan data proxies on such cases until the anomaly is adequately addressed by the Corporation.

e. *Loan-Level Data for All Rural Utility Program Volume*. The stress test requires loan-level data for all rural utility program volume. The specific loan data fields required for calculating the credit risk are outstanding principal, maturity date of the loan, maturity date of the AgVantage Plus contract (if applicable), and the rural utility guarantee fee percentage for each loan in Farmer Mac's rural utility loan portfolio on the date at which the stress test is conducted.

f. *Weighted Haircuts for Non-Program Investments.* For non-program investments, the stress test adjusts the weighted average yield data referenced in section 4.1.b. to reflect counterparty risk. Non-program investments are defined in §652.5. The Corporation must calculate the haircut to be applied to each investment based on the lowest whole-letter credit rating the investment received from an NRSRO using the haircut levels in effect at the time. Haircut levels shall be the same amounts calculated for the GOA factor in section 2.4.b.3 above. The first table provides the mappings of NRSRO ratings to whole-letter ratings for purposes of applying haircuts. Any '' + '' or '' – '' signs appended to NRSRO ratings that are not shown in the table should be ignored for purposes of mapping NRSRO ratings to FCA whole-letter ratings. The second table provides the haircut levels by whole-letter rating category.

FCA WHOLE-LETTER CREDIT RATINGS MAPPED TO RATING AGENCY CREDIT RATINGS

FCA Ratings Category.	AAA	AA	A	BBB	Below BBB and Unrated.
Standard & Poor's Long-Term.	AAA	AA	A	BBB	Below BBB and Unrated.
Fitch Long-Term	AAA	AA	A	BBB	Below BBB and Unrated.
Standard & Poor's Short-Term.	A–1 + SP–1 +	A–1 SP–1	A–2 SP–2	A–3	SP–3, B, or Below and Unrated.
Fitch Short-Term	F–1 +	F–1	F–2	F–3	Below F–3 and Unrated.
Moody's		Prime-MIG12. VMIg1	Prime-2 MIG2 VMIG2.	Prime-3 MIG3 VMIG3.	Not Prime, SG and Unrated.
Fitch Bank Ratings	A	B A/B	C B/C	D C/D	E. D/E.
Moody's Bank Financial Strength Rating.	A	B	C	D	E.

FARMER MAC RBCST MAXIMUM HAIRCUT BY RATINGS CLASSIFICATION

Ratings classification	Non-program investment counterparties (excluding derivatives) (percent)
Cash	0.00
AAA	1.41
AA	3.70
A	5.13
BBB	11.48
Below BBB or Unrated	44.52

1. Certain special cases will receive the following treatment. For an investment structured as a collateralized obligation backed by the issuer's general obligation and, in turn, a pool of collateral, reference the Issuer Rating or Financial Strength Rating of that issuer as the credit rating applicable to the security. Unrated securities that are fully guaranteed by Government-sponsored enterprises (GSE) such as the Federal National Mortgage Corporation (Fannie Mae) will receive the same treatment as AAA securities. Unrated securities backed by the full faith and credit of the U.S. Government will not receive a haircut. Unrated securities that are not fully guaranteed by a GSE will receive the haircut level in place at that time for ''Below BBB and Unrated'' investments unless the Director, at the Director's discretion, determines to apply a lesser haircut. In making this determination, the Director will consider the risk characteristics associated with the structure of individual instruments.

2. If portions of investments are later sold by Farmer Mac according to their specific risk characteristics, the Director will take reasonable measures to adjust the haircut level applied to the investment to recognize the change in the risk characteristics of the retained portion. The Director will consider relevant similar methods for dealing with capital requirements adopted by other Federal financial institution regulators in similar situations.

3. Individual investment haircuts must then be aggregated into weighted-average haircuts by investment category and submitted in the ''Data Inputs'' worksheet. The spreadsheet uses these inputs to reduce the weighted-average yield on the investment category to account for counterparty insolvency according to a 10-year linear phase-in of the haircuts. Each asset account category

identified in this data requirement is discussed in section 4.2, ''Assumptions and Relationships.''

4.2 Assumptions and Relationships

a. The stress test assumptions are summarized on the worksheet called ''Assumptions and Relationships.'' Some of the entries on this page are direct user entries. Other entries are relationships generated from data supplied by Farmer Mac or other sources as discussed in section 4.1, ''Data Inputs.'' After current financial data are entered, the user selects the date for running the stress test. This action causes the stress test to identify and select the appropriate data from the ''Data Inputs'' worksheet. The next section highlights the degree of disaggregation needed to maintain reasonably representative financial characterizations of Farmer Mac in the stress test. Several specific assumptions are established about the future relationships of account balances and how they evolve.

b. From the data and assumptions, the stress test computes pro forma financial statements for 10 years. The stress test must be run as a ''steady state'' with regard to program balances (with the exception of AgVantage Plus volume, in which case maturities are recognized by the model), and where possible, will use information gleaned from recent financial statements and other data supplied by Farmer Mac to establish earnings and cost relationships on major program assets that are applied forward in time. As documented in the stress test, entries of ''1'' imply no growth and/or no change in account balances or proportions relative to initial conditions with the exception of pre-1996 loan volume being transferred to post-1996 loan volume. The interest rate risk and credit loss components are applied to the stress test through time. The individual sections of that worksheet are:

(1) *Elements related to cashflows, earnings rates, and disposition of discontinued program assets.*

(A) The stress test accounts for earnings rates by asset class and cost rates on funding. The stress test aggregates investments into the categories of: Cash and money market securities; commercial paper; certificates of deposit; agency mortgage-backed securities and collateralized mortgage obligations; and other investments. With FCA's concurrence, Farmer Mac is permitted to further disaggregate these categories. Similarly, we may require new categories for future activities to be added to the stress test. Loan items requiring separate accounts include the following:

(i) Farmer Mac I program assets post-1996 Act;

(ii) Farmer Mac I program assets post-1996 Act Swap balances;

(iii) Farmer Mac I program assets pre-1996 Act;

(iv) Farmer Mac I AgVantage securities;

(v) Loans held for securitization;

(vi) Farmer Mac II program assets; and

(vii) Rural Utility program volume on balance sheet.

(B) The stress test also uses data elements related to amortization and prepayment experience to calculate and process the implied rates at which asset and liability balances terminate or ''roll off'' through time. Further, for each category, the stress test has the capacity to track account balances that are expected to change through time for each of the above categories. For purposes of the stress test, all assets are assumed to maintain a ''steady state'' with the implication that any principal balances retired or prepaid are replaced with new balances. The exceptions are that expiring pre-1996 Act program assets are replaced with post-1996 Act program assets and AgVantage Plus volume maturities are recognized by the model.

(2) *Elements related to other balance sheet assumptions through time.* As well as interest earning assets, the other categories of the balance sheet that are modeled through time include interest receivable, guarantee fees receivable, rural utility guarantee fees receivable, prepaid expenses, accrued interest payable, accounts payable, accrued expenses, reserves for losses (loans held and guaranteed securities), and other off-balance sheet obligations. The stress test is consistent with Farmer Mac's existing reporting categories and practices. If reporting practices change substantially, the above list will be adjusted accordingly. The stress test has the capacity to have the balances in each of these accounts determined based upon existing relationships to other earning accounts, to keep their balances either in constant proportions of loan or security accounts, or to evolve according to a user-selected rule. For purposes of the stress test, these accounts are to remain constant relative to the proportions of their associated balance sheet accounts that generated the accrued balances.

(3) *Elements related to income and expense assumptions.* Several other parameters that are required to generate pro forma financial statements may not be easily captured from historic data or may have characteristics that suggest that they be individually supplied. These parameters are the gain on agricultural mortgage-backed securities (AMBS) sales, miscellaneous income, operating expenses, reserve requirement, guarantee fees, rural utility guarantee fees, and loan loss resolution timing.

(A) The stress test applies the actual weighted average gain rate on sales of AMBS over the most recent 3 years to the dollar

amount of AMBS sold during the most recent four quarters in order to estimate gain on sale of AMBS over the stress period.

(B) The stress test assumes miscellaneous income at a level equal to the average of the most recent 3-year's actual miscellaneous income as a percent of the sum of; cash, investments, guaranteed securities, and loans held for investment.

(C) The stress test assumes that short-term cost of funds is incurred in relation to the amount of defaulting loans purchased from off-balance sheet pools. The remaining unpaid principal balance on this loan volume is the origination amount reduced by the proportion of the total portfolio that has amortized as of the end of the most recent quarter. This volume is assumed to be funded at the short-term cost of funds and this expense continues for a period equal to the loan loss resolution timing period (LLRT) period minus 1. We will calculate the LLRT period from Farmer Mac data. In addition, during the LLRT period, all guarantee income associated with the loan volume ceases.

(D) The stress test generates no interest income on the estimated volume of defaulted on-balance sheet loan volume required to be carried during the LLRT period, but continues to accrue funding costs during the remainder of the LLRT period.

(E) You must update the LLRT period in response to changes in the Corporation's actual experience with each quarterly submission.

(F) Operating costs are determined in the model using weighted moving average of operating expenses as a percentage of the sum of on-balance sheet assets and off-balance sheet program activities over the previous four quarters inclusive of the current submission date. The share will then be applied forward to the balances of the same categories throughout the 10-year period of the RBCST model. As additional data accumulate, the specification will be re-examined and modified if we deem changing the specification results in a more appropriate representation of operating expenses.

(G) The reserve requirement as a fraction of loan assets can also be specified. However, the stress test is run with the reserve requirement set to zero. Setting the parameter to zero causes the stress test to calculate a risk-based capital level that is comparable to regulatory capital, which includes reserves. Thus, the risk-based capital requirement contains the regulatory capital required, including reserves. The amount of total capital that is allocated to the reserve account is determined by GAAP. The stress test applies quarterly updates of the weighted average guarantee rates for post-1996 Farmer Mac I assets, pre-1996 Farmer Mac I assets, and Farmer Mac II assets.

(4) *Elements related to earnings rates and funding costs.*

(A) The stress test can accommodate numerous specifications of earnings and funding costs. In general, both relationships are tied to the 10-year CMT interest rate. Specifically, each investment account, each loan item, and each liability account can be specified as fixed rate, or fixed spread to the 10-year CMT with initial rates determined by actual data. The stress test calculates specific spreads (weighted average yield less initial 10-year CMT) by category from the weighted average yield data supplied by Farmer Mac as described earlier. For example, the fixed spread for Farmer Mac I program post-1996 Act mortgages is calculated as follows:

Fixed Spread = Weighted Average Yield less 10-year CMT 0.014 = 0.0694—0.0554

(B) The resulting fixed spread of 1.40 percent is then added to the 10-year CMT when it is shocked to determine the new yield. For instance, if the 10-year CMT is shocked upward by 300 basis points, the yield on Farmer Mac I program post-1996 Act loans would change as follows:

Yield = Fixed Spread + 10-year CMT .0994 = .014 + .0854

(C) The adjusted yield is then used for income calculations when generating pro forma financial statements. All fixed-spread asset and liability classes are computed in an identical manner using starting yields provided as data inputs from Farmer Mac. The fixed-yield option holds the starting yield data constant for the entire 10-year stress test period. You must run the stress test using the fixed-spread option for all accounts except for discontinued program activities, such as Farmer Mac I program loans made before the 1996 Act. For discontinued loans, the fixed-rate specification must be used if the loans are primarily fixed-rate mortgages.

(5) *Elements related to interest rate shock test.* As described earlier, the interest rate shock test is implemented as a single set of forward interest rates. The stress test applies the up-rate scenario and down-rate scenario separately. The stress test also uses the results of Farmer Mac's shock test, as described in paragraph c. of section 4.1, ''Data Inputs,'' to calculate the impact on equity from a stressful change in interest rates as discussed in section 3.0 titled, ''Interest Rate Risk.'' The stress test uses a schedule relating a change in interest rates to a change in the market value of equity. For instance, if interest rates are shocked upward so that the percentage change is 262 basis points, the linearly interpolated effective estimated duration of equity is −6.7405 years given Farmer Mac's interest rate measurement results at 250 and 300 basis points of −6.7316 and 76.7688

years, respectively found on the effective duration schedule. The stress test uses the linearly interpolated estimated effective duration for equity to calculate the market value change by multiplying duration by the base value of equity before any rate change from Farmer Mac's interest rate risk measurement results with the percentage change in interest rates.

4.3 Risk Measures

a. This section describes the elements of the stress test in the worksheet named ''Risk Measures'' that reflect the interest rate shock and credit loss requirements of the stress test.

b. As described in section 3.1, the stress test applies the statutory interest rate shock to the initial 10-year CMT rate. It then generates a series of fixed annual interest rates for the 10-year stress period that serve as indices for earnings yields and cost of funds rates used in the stress test. (See the ''Risk Measures'' worksheet for the resulting interest rate series used in the stress test.)

c. The Credit Loss Module's state-level loss rates, as described in section 2.4 entitled, ''Calculation of Loss Rates for Use in the Stress Test,'' are entered into the ''Risk Measures'' worksheet and applied to the loan balances that exist in each state. The distribution of loan balances by state is used to allocate new loans that replace loan products that roll off the balance sheet through time. The loss rates are applied both to the initial volume and to new loan volume that replaces expiring loans. The total life of loan losses that are expected at origination are then allocated through time based on a set of user entries describing the time-path of losses.

d. The loss rates estimated in the credit risk component of the stress test are based on an origination year concept, adjusted for loan seasoning. All losses arising from loans originated in a particular year are expressed as lifetime age-adjusted losses irrespective of when the losses actually occur. The fraction of the origination year loss rates that must be used to allocate losses through time are 43 percent to year 1, 17 percent to year 2, 11.66 percent to year 3, and 4.03 percent for the remaining years. The total allocated losses in any year are expressed as a percent of loan volume in that year to reflect the conversion to exposure year.

e. The credit loss exposure on rural utility volume, described in section 2.6, ''Calculation of Loss Rates on Rural Utility Volume for Use in the Stress Test,'' is entered into the ''Risk Measures'' worksheet applied to the volume balance. All losses arising from rural utility loans are expressed as annual loss rates and distributed over the weighted average maturity of the rural utility AgVantage Plus Volume, or as annual loss across the full 10-year modeling horizon in the case of rural utility Cash Window loans.

4.4 Loan and Cashflow Accounts

The worksheet labeled ''Loan and Cashflow Data'' contains the categorized loan data and cashflow accounting relationships that are used in the stress test to generate projections of Farmer Mac's performance and condition. The steady-state formulation results in account balances that remain constant except for the effects of discontinued programs, maturing AgVantage Plus positions, and the LLRT adjustment. For assets with maturities under 1 year, the results are reported for convenience as though they matured only one time per year with the additional convention that the earnings/cost rates are annualized. For the pre-1996 Act assets, maturing balances are added back to post-1996 Act account balances. The liability accounts are used to satisfy the accounting identity, which requires assets to equal liabilities plus owner equity. In addition to the replacement of maturities under a steady state, liabilities are increased to reflect net losses or decreased to reflect resulting net gains. Adjustments must be made to the long- and short-term debt accounts to maintain the same relative proportions as existed at the beginning period from which the stress test is run with the exception of changes associated with the funding of defaulted loans during the LLRT period. The primary receivable and payable accounts are also maintained on this worksheet, as is a summary balance of the volume of loans subject to credit losses.

4.5 Income Statements

a. Information related to income performance through time is contained on the worksheet named ''Income Statements.'' Information from the first period balance sheet is used in conjunction with the earnings and cost-spread relationships from Farmer Mac supplied data to generate the first period's income statement. The same set of accounts is maintained in this worksheet as ''Loan and Cashflow Accounts'' for consistency in reporting each annual period of the 10-year stress period of the test with the exception of the line item labeled ''Interest reversals to carry loan losses'' which incorporates the LLRT adjustment to earnings from the ''Risk Measures'' worksheet. Loans that defaulted do not earn interest or guarantee and commitment fees during LLRT period. The income from each interest-bearing account is calculated, as are costs of interest-bearing liabilities. In each case, these entries are the associated interest rate for that period multiplied by the account balances.

b. The credit losses described in section 2.0, ''Credit Risk,'' are transmitted through the provision account, as is any change needed

to re-establish the target reserve balance. For determining risk-based capital, the reserve target is set to zero as previously indicated in section 4.2. Under the income tax section, it must first be determined whether it is appropriate to carry forward tax losses or recapture tax credits. The tax section then establishes the appropriate income tax liability that permits the calculation of final net income (loss), which is credited (debited) to the retained earnings account.

4.6 Balance Sheets

a. The worksheet named ''Balance Sheets'' is used to construct pro forma balance sheets from which the capital calculations can be performed. As can be seen in the Excel spreadsheet, the worksheet is organized to correspond to Farmer Mac's normal reporting practices. Asset accounts are built from the initial financial statement conditions, and loan and cashflow accounts. Liability accounts including the reserve account are likewise built from the previous period's results to balance the asset and equity positions. The equity section uses initial conditions and standard accounts to monitor equity through time. The equity section maintains separate categories for increments to paid-in-capital and retained earnings and for mark-to-market effects of changes in account values. The process described below in the ''Capital'' worksheet uses the initial retained earnings and paid-in-capital account to test for the change in initial capital that permits conformance to the statutory requirements. Therefore, these accounts must be maintained separately for test solution purposes.

b. The market valuation changes due to interest rate movements must be computed utilizing the linearly interpolated schedule of estimated equity effects due to changes in interest rates, contained in the ''Assumptions & Relationships'' worksheet. The stress test calculates the dollar change in the market value of equity by multiplying the base value of equity before any rate change from Farmer Mac's interest rate risk measurement results, the linearly interpolated estimated effective duration of equity, and the percentage change in interest rates. In addition, the earnings effect of the measured dollar change in the market value of equity is estimated by multiplying the dollar change by the blended cost of funds rate found on the ''Assumptions & Relationships'' worksheet. Next, divide by 2 the computed earnings effect to approximate the impact as a theoretical shock in the interest rates that occurs at the mid-point of the income cycle from period t_0 to period t_1. The measured dollar change in the market value of equity and related earnings effect are then adjusted to reflect any tax-related benefits. Tax adjustments are determined by including the measured dollar change in the market value of equity and the earnings effect in the tax calculations found in the ''Income Statements'' worksheet. This approach ensures that the value of equity reflects the economic loss or gain in value of Farmer Mac's capital position from a change in interest rates and reflects any immediate tax benefits that Farmer Mac could realize. Any tax benefits in the module are posted through the income statement by adjusting the net taxes due before calculating final net income. Final net income is posted to accumulated unretained earnings in the shareholders' equity portion of the balance sheet. The tax section is also described in section 4.5 entitled, ''Income Statements.''

c. After one cycle of income has been calculated, the balance sheet as of the end of the income period is then generated. The ''Balance Sheet'' worksheet shows the periodic pro forma balance sheets in a format convenient to track capital shifts through time.

d. The stress test considers Farmer Mac's balance sheet as subject to interest rate risk and, therefore, the capital position reflects mark-to-market changes in the value of equity. This approach ensures that the stress test captures interest rate risk in a meaningful way by addressing explicitly the loss or gain in value resulting from the change in interest rates required by the statute.

4.7 Capital

The ''Capital'' worksheet contains the results of the required capital calculations as described below, and provides a method to calculate the level of initial capital that would permit Farmer Mac to maintain positive capital throughout the 10-year stress test period.

5.0 CAPITAL CALCULATION

a. The stress test computes regulatory capital as the sum of the following:

(1) The par value of outstanding common stock;

(2) The par value of outstanding preferred stock;

(3) Paid-in capital;

(4) Retained earnings; and

(5) Reserve for loan and guarantee losses.

b. Inclusion of the reserve account in regulatory capital is an important difference compared to minimum capital as defined by the statute. Therefore, the calculation of reserves in the stress test is also important because reserves are reduced by loan and guarantee losses. The reserve account is linked to the income statement through the provision for loan-loss expense (provision). Provision expense reflects the amount of current income necessary to rebuild the reserve account to acceptable levels after loan losses reduce the account or as a result of increases

in the level of risky mortgage positions, both on- and off-balance sheet. Provision reversals represent reductions in the reserve levels due to reduced risk of loan losses or loan volume of risky mortgage positions. The liabilities section of the ''Balance Sheets'' worksheet also includes separate line items to disaggregate the Guarantee and commitment obligation related to the Financial Accounting Standards Board Accounting Standards Codification Topic 460, Guarantees. This item is disaggregated to permit accurate calculation of regulatory capital post-adoption of FIN 45. When calculating the stress test, the reserve is maintained at zero to result in a risk-based capital requirement that includes reserves, thereby making the requirement comparable to the statutory definition of regulatory capital. By setting the reserve requirement to zero, the capital position includes all financial resources Farmer Mac has at its disposal to withstand risk.

5.1 Method of Calculation

a. Risk-based capital is calculated in the stress test as the minimum initial capital that would permit Farmer Mac to remain solvent for the ensuing 10 years. To this amount, an additional 30 percent is added to account for managerial and operational risks not reflected in the specific components of the stress test.

b. The relationship between the solvency constraint (*i.e.*, future capital position not less than zero) and the risk-based capital requirement reflects the appropriate earnings and funding cost rates that may vary through time based on initial conditions. Therefore, the minimum capital at a future point in time cannot be directly used to determine the risk-based capital requirement. To calculate the risk-based capital requirement, the stress test includes a section to solve for the minimum initial capital value that results in a minimum capital level over the 10 years of zero at the point in time that it would actually occur. In solving for initial capital, it is assumed that reductions or additions to the initial capital accounts are made in the retained earnings accounts, and balanced in the debt accounts at terms proportionate to initial balances (same relative proportion of long- and short-term debt at existing initial rates). Because the initial capital position affects the earnings, and hence capital positions and appropriate discount rates through time, the initial and future capital are simultaneously determined and must be solved iteratively. The resulting minimum initial capital from the stress test is then reported on the ''Capital'' worksheet of the stress test. The ''Capital'' worksheet includes an element that uses Excel's ''solver'' or ''goal seek'' capability to calculate the minimum initial capital that, when added (subtracted) from initial capital and replaced with debt, results in a minimum capital balance over the following 10 years of zero.

[71 FR 77253, Dec. 26, 2006, as amended at 73 FR 31940, June 5, 2008; 76 FR 23467, Apr. 27, 2011; 78 FR 21037, Apr. 9, 2013]

PART 653—FEDERAL AGRICULTURAL MORTGAGE CORPORATION RISK MANAGEMENT

Sec.

653.1 Definitions.
653.2 General.
653.3 Risk management.
653.4 Internal controls.

AUTHORITY: Secs. 8.3, 8.4, 8.6, 8.8, and 8.10 of Pub. L. 92–181, 85 Stat. 583 (12 U.S.C. 2279aa–3, 2279aa–4, 2279aa–6, 2279aa–8, and 2279aa–10).

SOURCE: 81 FR 49154, July 27, 2016, unless otherwise noted.

§ 653.1 Definitions.

The following definitions apply to this part:

Corporation means the Federal Agricultural Mortgage Corporation and its affiliates.

FCA means the Farm Credit Administration, an independent Federal agency of the executive branch.

OSMO means the FCA Office of Secondary Market Oversight, which is responsible for the general supervision of the safe and sound exercise of the Corporation's powers, functions, and duties and compliance with laws and regulations.

§ 653.2 General.

The Corporation's board of directors must approve the overall risk-appetite of the Corporation and regularly monitor internal controls to provide reasonable assurance that risk-taking activities are conducted in a safe and sound manner.

§ 653.3 Risk management.

(a) *Risk management program.* The Corporation's board of directors must establish, maintain, and periodically update an enterprise-wide risk management program addressing how the Corporation's activities are exercised in a