prior to implementation of the new business program.

§ 650.27 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 § 650.26.

(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 § 650.24.

(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 not later than the last business day of April, July, October, and January of each year.

§ 650.28 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.

§ 650.29 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 § 650.23, 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.

§ 650.30 Effective date for compliance with regulation.

For the 12-month period beginning on the effective date of this subpart, you must determine a risk-based capital level by implementing the risk-based capital stress test as described in § 650.23 and Appendix A to this subpart, and you must report the results to us as described in § 650.28. During this 12-month period, you will not be required to maintain capital at the risk-based capital level, but you must maintain your minimum capital level as prescribed in section 8.33 of the Act. Beginning on the day following the 12-month period, you must comply with all provisions of this subpart.

§ 650.31 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 650—RISK-BASED CAPITAL STRESS TEST

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, 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, 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 loss-frequency and loss-severity equations to Farmer Mac loan-level data. From these equations, 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 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

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 and loss-severity equations by substituting the respective values of Farmer Mac's loan-level data, and applying stressful economic inputs.

b. The loss-frequency and loss-severity equations 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 default frequency and loss-severity equations. 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]

[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/

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
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

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 *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 *www.fca.gov*.

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. 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 2.5, ''Calculation of Loss Rates for Use in the Stress Test.''

2.2 Loan-Seasoning Adjustment

a. You must use the seasoning distribution to adjust each Farmer Mac loan for the cumulative loss exposure already experienced based on age. The effect of seasoning on the probability of loss is represented as a beta distribution. The distribution is based on the estimation data used to determine the loss-frequency equation. Using the estimation data, the cumulative total loss fractions are used to calculate the cumulative proportion of losses at each point in time. The two parameters of the beta distribution are then solved using a least squares error distance function, implemented with Microsoft Excel's solver utility. The spreadsheet for calculating the beta distribution is available on our Web site, *www.fca.gov*, or upon request.

b. The Excel solver utility uses a least squares framework rather than a direct maximum likelihood (product of probabilities) estimator. As a result, the Excel solver utility produces beta distribution parameters that are immaterially different from those estimated directly using a maximum likelihood estimator. The estimation of the beta distribution parameters is based on an average life of 14 years for agricultural mortgages. If the average life of agricultural mortgages in Farmer Mac's portfolio over

[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.

time differs significantly from 14 years, we may re-estimate the beta distribution parameters.

c. The estimated seasoning beta distribution parameters for a 14-year average loan life that must be used are 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

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,

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

Default Loss Frequency @ (−16.64%) = $1 / 1 + \exp^{-(-1.428509)} = 0.19333111$

And

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

Loss Frequency Probability @ (−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 @ −16.64 percent'' and ''Loss-Frequency Probability @ −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 −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 are 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 adjustment of 0.157178762 is determined from the beta distribution for a 4-year old loan.

2.4 Treatment of Long-Term Standby Purchase Commitments

The loss-frequency equation cannot be directly used to compute the loss exposure on loans covered by a long-term standby purchase commitment (standbys) because complete underwriting standards for these loans are unavailable. Instead, the initial loss rate applied to each standby loan is the respective state-level average loss rate unadjusted for loan seasoning. You must calculate the state-level loss rates from non-standby loans as total dollar loan losses before the loan-seasoning adjustment divided by total origination loan balances. Then, you must multiply the origination loan balance of each standby loan by the appropriate loss rate to calculate estimated dollar losses. You must then adjust the resulting standby loan-level dollar losses adjusted for loan seasoning as was done for non-standby loans. For example, consider a $1,000,000 standby loan originated in Idaho in 1990. And, suppose the unadjusted loss rate for Idaho is 3 percent. The loss for this loan is:

($1,000,000 · 0.03) = $30,000.

The loan is 7 years old, thus the seasoning adjustment is 0.635989125. The estimated age-adjusted losses for the standby loan are:

$10,920 = ($30,000)(1 − 0.635989125)

2.5 Calculation of Loss Rates for Use in the Stress Test

a. You must compute the loss rates by state (based on Farmer Mac's loan portfolio distribution) after you calculate dollar loan losses for each loan subject to loss in Farmer Mac's portfolio. The estimated lifetime losses adjusted for loan seasoning for non-standby loans are computed as total dollar loan losses adjusted for loan seasoning divided by total scheduled current loan balances for each state. Similarly, you must calculate the estimated lifetime losses and adjust for loan seasoning for standby loans. This calculation is the total dollar loan losses adjusted for loan seasoning divided by total scheduled current loan balances for each state. You must then blend the resulting state-level loss rates for non-standby and standby loans by blending the average loss rate for each state weighted by volume. The state loss rates estimated for Farmer Mac's loan portfolio are calculated in the spreadsheet, ''Credit Loss Module.XLS.'' 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.''

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,[15] 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:

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

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.

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 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 Cashflow Accounts;
(5) Income Statements;
(6) Balance Sheets; and
(7) Capital.

b. Each of the components is described in further detail in sections 4.1 through 4.7 of this appendix 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. The spreadsheet uses this cashflow information to generate starting and ending account balances, interest earnings, 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 paragraph 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:

All other Farmer Mac I program loans	Long-term standby commitments
Loan Number	Loan Number.
Ending Scheduled Balance	Current Month Actual Balance.
Group	Group.
Pre/Post Act	Pre/Post Act.
Property State	Property State.
Product Type	Product Type.
Origination Date	Note Date.
Origination Loan Balance	Origination Loan Balance.
Origination Scheduled P & I	Cutoff Scheduled P & I.
Origination Appraised Value	Most Recent Appraised Value.
Loan-to-Value Ratio	Loan-To-Value Ratio.
Current Assets	Current Assets.
Current Liabilities	Current Liabilities.
Total Assets	Total Assets.
Total Liabilities	Total Liabilities.
Gross Farm Revenue	Gross Farm Revenue.
Net Farm Income	Net Farm Income.
Depreciation	Depreciation.
Interest on Capital Debt	Interest On Capital Debt.
Capital Lease Payments	Capital Lease Payments.
Living Expenses	Living Expenses.
Income & FICA Taxes	Income & FICA Taxes.
Net Off-Farm Income	Net Off-Farm Income.
Total Debt Service	Total Debt Service.
Guarantee Fee	Commitment Fee Rate.
Seasoned Loan	Seasoned Loan.

(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, blended across standby and non-standby program assets 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.''

e. *Other Data Requirements.* Other data elements are taxes paid over the previous 2 years, the corporate tax schedule, selected line items from Schedule RS–C of the Call Report, and 10-year CMT information as discussed in section 3.1 entitled, ''Process for Calculating the Interest Rate Movement.'' The stress test uses the corporate tax schedule and previous taxes paid to determine the appropriate amount of taxes, including available loss carry-backs and loss carry-forwards. Three line items found in sections Part II 2.a. and 2.b. of Call Report Schedule RS–C Capital Calculation must also be entered in the ''Data Inputs'' sheet. The two line items found in Part II 2.a. contain the dollar volume off-balance sheet assets relating to the Farmer Mac I and II programs. The off-balance sheet program asset dollar volumes are used to calculate the operating expense regression on a quarterly basis. The single-line item found in Part II 2.b. provides the amount of other off-balance sheet obligations and is presented in the balance sheet section of the stress test for purposes of completeness. The 10-year CMT quarterly average of the monthly series and the 12-month average of the monthly series must be entered in the ''Data Inputs'' sheet. These two

data elements are used to determine the starting interest rate and the level of the interest rate shock applied in the stress test.

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, 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. 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; and

(vi) Farmer Mac II program assets.

(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 categories in paragraph b. (1)(A) of this section. 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.

(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, 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 list in this section 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, and guarantee fees. The stress test assumes a 75 basis points gain rate on sales of AMBS securities, recognizing that this parameter, while reasonably related to recent performance, may change with changes in market conditions. Miscellaneous income as a percentage of total assets contributes 2 basis points to income.

(A) Fixed costs and variable costs are determined from historical financial data by running a regression (ordinary least squares) of operating expenses, excluding provision expense and taxes, to on-and off-balance sheet assets, including investments and Farmer Mac program assets. The regression equation can be expressed as:

$$Y = \alpha + \beta_1 \ln(X) + \beta_2 D$$

(B) Where Y is operating expenses excluding provision for loans and tax expenses; ln(X) is the natural log of investments and Farmer Mac program assets held on-and off-balance sheet, and D is a dummy variable (1 represents pre-1996 and 0 represents post-1996). The regression is estimated using ordinary least squares, where (α) is the intercept, (β_1) is the coefficient on the logarithm of on-balance sheet program assets and investments, and off-balance sheet program assets, and (β_2) is the coefficient on the dummy variable.

(C) To run the stress test, the operating expense regression equation must be re-estimated using data from Farmer Mac's inception to the most recent quarterly financial information and the resulting coefficient entered into the ''Assumptions and Relationships'' worksheet. 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.

(D) 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 guarantee rates applied in the stress test are: post-1996 Farmer Mac I assets (50 basis points, current weighted average of 42 basis points); pre-1996 Farmer Mac I assets (25 basis points); and Farmer Mac II assets (25 basis points).

(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 −6.7688 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 blended loss rates by state, as described in section 2.5 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 as reported in the initial loan portfolio of Farmer Mac. The initial 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.

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. As can be seen in the worksheet, the steady-state formulation results in account balances that remain constant except for the effects of discontinued programs. 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. 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. 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 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 in section 5.0, 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. 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.

Subpart C—Receiver and Conservator

SOURCE: 62 FR 43636, Aug. 15, 1997, unless otherwise noted.

§ 650.50 Grounds for appointment of a receiver or conservator.

(a) The grounds for the appointment of a receiver or conservator for the Corporation are:

(1) The Corporation is insolvent. For purposes of this paragraph, insolvent means:

(i) The assets of the Corporation are less than its obligations to its creditors and others; or

(ii) The Corporation is unable to pay its debts as they fall due in the ordinary course of business;

(2) There has been a substantial dissipation of the assets or earnings of the Corporation due to the violation of any law, rule, or regulation, or the conduct of an unsafe or unsound practice;

(3) The Corporation is in an unsafe or unsound condition to transact business;

(4) The Corporation has committed a willful violation of a final cease-and-desist order issued by the Farm Credit Administration Board;

(5) The Corporation is concealing its books, papers, records, or assets, or is refusing to submit its books, papers, records, assets, or other material relating to the affairs of the Corporation for inspection to any examiner or any lawful agent of the Farm Credit Administration Board.

(b) In addition to the grounds set forth in paragraph (a) of this section, a receiver can be appointed for the Corporation if the Farm Credit Administration Board determines that the appointment of a conservator would not be appropriate when one of the following conditions exists:

(1) The authority of the Corporation to purchase qualified loans or issue or guarantee loan-backed securities is suspended; or

(2) The Corporation is classified under section 8.35 of the Act as within enforcement level III or IV and the alternative actions available under subtitle B of title VIII of the Act are not satisfactory.

(c) In addition to the grounds set forth in paragraph (a) of this section, a conservator can be appointed for the Corporation if:

(1) The Corporation is classified under section 8.35 of the Act as within enforcement level III or IV; or

(2) The authority of the Corporation to purchase qualified loans or issue or guarantee loan-backed securities is suspended.

§ 650.51 Action for removal of receiver or conservator.

Upon the appointment of a receiver or conservator for the Corporation by the Farm Credit Administration Board pursuant to § 650.50 of this subpart, the Corporation may, within 30 days of such appointment, bring an action in the United States District Court for the District of Columbia, for an order requiring the Farm Credit Administration Board to remove the receiver or conservator and, if the charter has been canceled, to rescind the cancellation of the charter. Notwithstanding any other provision of this part, the Corporation's board of directors is empowered to meet subsequent to such appointment and authorize the filing of an action for removal. An action for removal may be authorized only by the Corporation's board of directors.

§ 650.52 Voluntary liquidation.

(a) The Corporation may voluntarily liquidate by a resolution of its board of directors, but only with the consent of,