AGRICULTURAL BANK MANAGEMENT SIMULATION GAME INSTRUCTIONS*

Introduction to the Bank Management Simulation Game

The non-Internet version of the agricultural bank management simulation game (Ag Bank Sim) has been used in the Oklahoma Bankers Association Intermediate School of Banking for over 20 years. It has also been used in the undergraduate Agricultural Finance classes at Oklahoma State University (OSU) and Louisiana State University (LSU). The new Internet version has been used in Agricultural Finance at OSU and a capstone undergraduate Strategy class at LSU.

These written instructions will introduce you and the rest of your bank's management team to the Ag Bank Sim game, and provide guidelines for helping your team make informed decisions. The instructions are divided into several sections. Each person in your bank management team is encouraged to read all of the instructions prior to making your team's initial decisions. First, there is an introduction to Ag Bank Sim and an overview of the model. The next section explains the bank's situation and the initial set of financial statements that accompany these instructions. Then, procedures are explained for calculating the amount of funds available for new loans and investments for the next period of play. The final section contains information on the various bank management decisions that you and your fellow team member(s) will make during each period of play.

* Chris Petermann is an Assistant Vice-President, Payne County Bank; Notie Lansford is a Professor, Department of Agricultural Economics, Oklahoma State University; Brian Briggeman is an Economist, Federal Reserve Bank, Kansas, Missouri; Damona Doye is Regents Professor and Sarkeys Distinguished Professor, Department of Agricultural Economics, Oklahoma State University; and Joshua Detre is an Assistant Professor, Department of Agricultural Economics and Agricultural Business, Louisiana State University Agricultural Center. The Agricultural Bank Management Simulation Game was originally known as the Oklahoma Bank Simulation Game and was developed with encouragement, cooperation, and financial assistance from the Oklahoma Bankers Association. The internet version was created with funding from the United States Department of Agriculture, CSREES/NIFA, and the Oklahoma Bankers Association.

Overview of Ag Bank Sim

An essential element of commercial banking is converting deposits into profitable loans and investments. Stated in this manner, the "production process" appears relatively simple. However, the decision environment is extremely complex. Banks operate in a highly dynamic and changing competitive environment, clouded by the uncertainty of future economic and financial trends and surrounded by the changing legal restrictions with which they must comply. In addition, this environment includes a growing list of competitors, including other banks and financial institutions, other companies and individuals, providing an increasing array of financial services and products. These complex and competitive aspects of commercial banking suggest that managers of urban and rural banks can use modern decision aids to maintain profit margins and enhance competitive positions.

A challenge facing commercial banks is the training of new employees for management positions. In banks that are departmentalized, employees of one department may not know the impact their decisions have on the overall financial position of the bank, and they may not understand the interactions among departments fully. A bank management simulation model is one method to improve student understanding of the complex competitive environment within which commercial banks operate and make decisions.

Objectives

The general objectives of the Ag Bank Sim game are to:

1. Provide participants a learning experience in making bank policy decisions that affect the acquisition and use of funds for a rural bank in an environment of changing economic and market conditions and competition from other banks.

2. Increase participants' understanding of the need for financial planning and analytical decision-making in bank asset and liability management.
3. Generate discussion among bank management team members regarding the specific management decisions that must be made and the potential impacts of those decisions.

The Ag Bank Sim game is designed to represent the policy management environment of a rural commercial bank. Each student participant will be assigned to a bank management team, whose task is, as of December 31, year 0, to begin managing one of the three banks in a county. The total market area for your bank is the county in which it resides and your bank competes with the other two banks in your county for deposits and loans. Agriculture is one of the principal industries in the county, with cow-calf, stocker cattle grazing, and wheat production being the most important agricultural enterprises. The initial financial statements, market shares of loans, investments, and deposits held by each of the three banks in the county are identical. One of the principal goals of each management team is to make the maximum possible profit, thus improving the bank's capital structure. However, other goals, such as maintaining market share and serving the community, are also important. The banks are assumed to comply with national banking regulations and are members of both the Federal Reserve System and the Federal Deposit Insurance Corporation (FDIC).

After studying the background data and beginning financial statements, the teams make decisions for the next six-month period of operation (Figure 1 highlights primary features of Ag Bank Sim operations). Those decisions include interest rates to charge on five types of loans, interest rates to pay on five types of deposits, the number of loan officers to employee, the loan officers' salaries, salaries for other employees, the bank's outlays for advertising, the service

charge on deposit accounts, and the volumes of new loans and investments the bank would like to make.

The computer program utilizes selected economic information for the county and the teams' decisions to estimate the county market volumes of deposit accounts supplied to the banks. The deposit accounts include Demand Deposit Accounts (DDA), Negotiable Orders of Withdrawal (NOW), Money Market Deposit Accounts (MMDA), Savings Accounts, and Certificates of Deposit (CD). The county market volumes for five classes of loans (Agricultural Production, Agricultural Real Estate, Real Estate, Commercial, and Consumer) are also estimated utilizing the county data and team decisions. After the market volumes of deposits and loans have been determined, market share equations utilize economic information and bank team decisions to allocate these volumes to the three competing banks in a county. The desired quantities of five categories of new investments (6-Month Government Securities, 1-Year Government Securities, 3-Year Government Securities, 2-Year Municipal Bonds, and 5-Year Municipal Bonds) are also acquired and added to the banks' investment portfolios.

The model contains a history file of past loan volumes and investment purchases and their corresponding interest rates. This information is used along with current additions to the loan and investment portfolios to calculate the costs and returns for the six-month period and to update the financial statements. New financial statements along with other relevant data are given to the teams after the completion of a simulation. This information provides the basis for a new set of decisions for the next six-month period. Your team will manage the bank for a two-year period and therefore will make four sets of bank management decisions.

Balance Sheet

The initial statement of condition (Balance Sheet) for your bank, as of the end of the previous six-month period (2008.5 in this example) is shown in Table 1 (refer to the attached tables). Most of the items are self-explanatory. Assets include cash and due from, which consists of cash in the bank and deposits in other financial institutions. There are five categories of government securities, including investments in six-month, one-year, and three-year government securities, plus two-year and five-year municipal bonds. Federal Funds sold the previous period (if appropriate) are included. (If a bank has cash in excess of reserve requirements for the current period, the bank automatically sells Federal Funds up to 100% of equity capital. Cash in excess of equity capital and the reserve requirement, however, is neither invested in Federal Funds nor earns interest.) There are five classes of loans: agricultural production, agricultural real estate, real estate, commercial, and consumer loans. The final asset category is bank premises and equipment, and this value remains constant over the periods of play.

Liabilities include five classes of deposits. DDA deposits are non-interest bearing checking deposits. NOW deposits are Negotiable Orders of Withdrawal, MMDA deposits are Money Market Deposit Accounts, and Savings Accounts represent savings deposits in the bank. The CD category includes all Certificates of Deposit regardless of size or maturity. Also included is the amount of Federal Funds purchased last period (if appropriate). (When a bank does not have enough cash to meet operating cash and Federal Reserve requirements on deposits, Federal Funds are automatically purchased as needed up to the level of total investment securities. If the bank must borrow Federal Funds in excess of total investment securities, the rate charged is one and one-half times the Federal Funds rate for the current period. Fed Funds purchased must be repaid the next period.) The Capital and Surplus account does not change over time. Each period's net income after taxes is

accumulated in the Retained Earnings account. Selected financial ratios computed from the balance sheet data are shown below the balance sheet. The capital-to-asset ratio is important to bank examiners. In the simulation, if the capital-to-asset ratio falls below five percent, a warning is printed and new loans may be restricted until the capital-to-asset ratio is five percent. The loan-to-deposit ratio has traditionally been used by the banking industry to measure asset liquidity. Finally, the investments-to-total assets ratio indicates the relative importance of investments in the capital structure of the bank.

The income statement for the previous six-month period is shown in Table 2. The income statement summarizes all income and expense items (left side) and provides a detailed breakdown of interest income and interest payments (right side). Since this is a semi-annual income statement, all income and expenses are reported on a six-month basis. Loans and investments earn interest each six-month period on the outstanding balances and income is posted to the income statement each period. If the bank has cash in excess of the reserve requirements, interest earned from the sale of Federal Funds is also reported as income. Service charge income is based on the service charge decision made by your management team and the level of transaction deposits (DDA, NOW, MMDA) during the period.

Expenses include a deposit expense that is based on the average interest rate paid on and volume of each type of deposit. The Federal Funds expense is the interest paid on any Federal Funds purchased during the current period. The bank's expenditures on advertising, loan officer salaries, and employees' salaries are based on the team's decisions for the most recent period. Loan officer salary expense is based on the number of loan officers and the average loan officer salary. Employee salary is based on the average employee salary decision and the number of bank employees, which is initially set at $20,000 per employee. The other expense category includes

costs of FDIC insurance, mailings, supplies, depreciation, employee benefits, and any other expenses incurred by the bank (approximately 1% of assets). The last expense entry is loan losses (charge-offs) for each loan type. The information included in this subsection includes: the actual dollar amount of charge-offs during the current period, the dollar amount of charge-offs as a percent of the total loans, and a historical range of loan charge-offs for each loan type. The historical range of losses should indicate to participants the relative risk associated with each loan type; however, the amount of charge-offs by loan type is a random and unpredictable event for each bank during each period. The actual dollar amounts of loan losses are included as expenses against income for the six-month period in which they are charged-off. Taxes are determined using corporate income tax rates (Table 7). A more detailed discussion of taxes is provided later. Net income for the current period is reported for the bank, along with total accumulated income for the periods of play completed.

The top portion of Table 3 lists the decisions that were made by the bank management team for the previous six-month period. In addition to the maximum new loan volumes desired, the actual new loans made during that period (in this example, 2008.5) are also presented for each type of loan. The actual investments made last period are shown below the loans.

The bottom half of Table 3 shows the amount of maturing investments and loans for the next four years. The first five rows represent investments in securities and the last five rows show the maturing loans. The rows contain the schedules of loan principal payments and investment maturities. The column headings identify the periods in which the assets will mature. For example, of the $7,000,000 in 1-Year Government Securities (row 2, bottom half, Table 3) that the bank owns, $3,000,000 are due now (end of 2008.5 in this example) and will be available for new loans and investments. The remaining $4,000,000 will be due at the end of the next period (2009.0 in

this example). The amounts for the loans represent the share of the principal that is being repaid that period. Ag Real Estate loans (row 7 in the Maturing Assets section of Table 3), take ten years to mature and are paid back in ten equal principal payments. So, for Ag Real Estate loans, the amount maturing in 2008.5 would be the summation of loan payments from ten prior periods.

Some rows may contain blanks and zeros. Blanks occur in rows because the length of the investment and/or term of the loan will prevent it from maturing beyond a certain period. For example, the 6-month Government Security (row 1, the Maturing Assets section of Table 3) fully matures after one period of play and contains only the $4,000,000 entry for the last period (in this example, 2008.5). Zeros occur because assets mature at irregular intervals, so the date at which a prior investment was purchased will dictate an asset's maturity date. For example, there are zero dollars of 5-year Municipal Bonds (row 5, table 3) maturing at the end of 2009.5. This means that five years ago (in 2005.0) the bank purchased no 5-year Municipal Bonds. The bottom row of Table 3 contains the total amount of maturing assets by period. Loans and investments valued at $15,716,232 mature now. This $15,716,232 is available to the bank for making new loans and investments for the next period (2009.0).

Table 4 provides current period data, as well as economic and statistical information relevant to decisions for the next six-month period. The top portion of the table presents county economic and market data for the previous six-month period. Economic data includes county per capita income, county retail sales, average land value, an index of new housing costs, a farm price index, and the futures price for wheat. These variables are significant in determining the county market supply of deposits and the demand for loans during the previous 6-month period. A comparison of the actual values in the current period with the range of values expected for the next period (bottom, right) indicates the likely direction of change for each economic indicator in the

next period. For example, the futures price of wheat during the previous period was $3.00 per bushel and its expected range for the next period is between $3.09 and $3.41. This increase in wheat prices should have a favorable impact on personal income and retail sales, as well as on the need for agricultural production loans in the county during the next period.

The data also includes the average interest rate paid by the three banks in your county on each type of deposit account and the average interest rate charged on each type of loan. Your bank is competing for deposits and loans with the two other banks in your county. Thus, the relationships among the interest rate your bank pays on, for example, MMDA deposits, and those paid by your bank's competitors, are important in determining the proportion of MMDA deposits your bank acquires. If your bank pays higher interest rates on deposits than its competitors, your bank would expect to attract more deposits. However, your bank's cost of funds will also be higher. In contrast, if your bank increases interest rates charged on loans substantially more than competitors do, your bank may not make as many loans as desired. The data presented also include the average service charge and average advertising expense for the three banks in your county. The impact of your bank's advertising expenses on your market share of deposits and loans will depend on your interest rates on different categories of deposits and loans relative to its competitors' interest rates and advertising outlays. For example, increasing your bank's advertising expenditures to promote interest rates on deposits that are higher than competitors should increase your bank's market share of deposits. Market share information on deposits and loans for each bank in the county at the end of the previous period is also shown in the top right hand portion of Table 4. After the initial period of play, these percentages will differ for each bank in a county and are dependent on the decisions made by your bank and the other two banks in your county.

The bottom portion of Table 4 presents economic and market information, which should be useful for management decision making in the next period. Included are the actual interest rates that will be received next period on each of the investment alternatives. (These rates will differ for each period of play but will be the same for all banks.) The Federal Funds rate reflects the cost of funds if your bank purchases Federal Funds (up to 100% of total equity capital), and the rate earned if your bank sells Federal Funds. The right side of the table presents the expected ranges for each of six economic indicators mentioned previously.

Table 5 presents your bank's asset portfolio of outstanding loans and securities. The loan or investment type is identified in the column heading, and the outstanding balances and corresponding interest rates are displayed by period. The year heading indicates the period during which the loans were issued or securities/municipal bonds were purchased. For example, of the agricultural real estate loans made during the first six months of 1999 (period 1999.0), a total of $38,306 in principal was outstanding at an interest rate of 9.50%. The aforementioned loan matured (was paid back) at the end of 2008 (2008.5) period. The information in Table 5 on the yield and maturity of each investment in the portfolio is also useful in making decisions on whether your bank should consider selling specific investments. Selling investments is discussed in more detail in the section on decision alternatives.

Estimation of Funds Available for Loans and Investments

Before a bank management team can make decisions concerning new loans and investments, the bank's management team needs to complete the worksheet, **Estimation of Funds Available for Loans and Investments** (Table 6):

1. Enter on Line 1 the *Total Value of Maturing Assets at the end of the previous period*. This figure is the total of the first column, $15,716,233, located in the bottom section of Table 3, Maturing Assets--next four years..
2. Enter on Line 2 the appropriate value for *Cash and Due From*. This is the first entry under Assets in Table 1, "cash and due from," $586,872.
3. Enter on Line 3 the *Anticipated Change in Deposits* for the coming period. The current level of total deposits ($50,160,000) is shown on the Liabilities side of Table 1. The estimated change in total deposits will depend on changes in county per capita income and county retail sales, and the bank's decisions for the next period relative to the county averages on deposit interest rates, service charge, advertising, number of loan officers and their salaries, and employee salaries. Table 4 of the bank simulation output presents Economic and Statistical Information for the current period, plus the expected ranges for this information in the next period; all of which will have an impact on the change in deposits. Deposits tend to increase in the second half of the year in conjunction with increased economic activity. However, the equations in the simulation model were estimated with data from a period of stable to declining deposits. Therefore, if no changes are made to attract deposits from other banks in the county, the total level of deposits will likely remain stable or even decline slightly. For illustrative purposes, we have entered a $100,000 increase in deposits in the Table 6 worksheet, but an individual bank may or may not achieve this deposit growth.
4. Enter on Line 4 *Cash you expect to receive from the Sale of Investments* during the coming period. A bank may sell investments in the current portfolio at a 2% discount. For example, if you plan to sell $500,000 of municipal bonds this period, the 2%

discount ($10,000) should be subtracted and $490,000 will become available for new loans and investments. Most of the banks surveyed indicated that they do not sell loans, so selling loans is not an option in Ag Bank Sim. Again, for illustrative purposes, we have entered no investment sales on Line 4 of the worksheet, but your bank's management team may wish to sell investments when making its decisions. If your team chooses to sell investments, insert the amount to be sold (less 2%) on Line 4 of the estimation of funds worksheet.

5. Enter on Line 5 the Amount of *Federal Funds Sold* during the current period, as shown under Assets in Table 1. Federal Funds sold last period totaled $2,716,406.

6. Enter on Line 6 *Projected Net Income After Taxes* for the next period. Net income after taxes for the previous period is presented in Table 2, Income Statement, and totaled $472,030.57. As an example, we have entered $475,000 as the projected net income for next period, but your bank's management team may want to change this figure.

7. Enter on Line 7 the *Reserve Requirement* for the next period, which is based on total transaction deposits (Table 1). Transaction deposits include DDA deposits, NOW deposits, and MMDA deposits for the current period, and total $19,562,400. The reserve requirement is three percent of the first $42.2 million in transaction deposits, and ten percent of transaction deposits over $42.2 million. For the current period, the reserve requirement was $586,872. If your bank plans to increase deposits, the reserve requirement will also increase slightly. Following is the calculation for the bank's reserve requirement:

IF DDA + NOW + MMDA < 42.2 million,

Reserve Requirement = (DDA + NOW + MMDA) * 0.03,

Else, Reserve Requirement = ((DDA + NOW + MMDA) - 42.2 milion) * 0.10 + 42.2 million * 0.03.

8. Enter on Line 8 the Amount of *Federal Funds Purchased* (Table 1) during the period. Since no Federal Funds were purchased last period, a zero entry is made.

9. Now your bank is ready to determine the amount of *Funds Available for New Loans and Investments* for the coming period and enter the value on Line 9. Add the values in Lines 1 through 6 and subtract Lines 7 and 8 to obtain $19,007,639.

The estimated amount of funds available should be used when making decisions on the volume of new loans to be made and investments to be purchased. Please note that the above estimation of funds available applies to all of the bank management teams in the Ag Bank Sim for the first period of play assuming your bank team sells no investments and expects a $100,000 increase for deposits. Consequently, if your bank management team chooses to sell funds and/or change the amount of new deposits, your team will need to adjust the estimation of funds worksheet accordingly. If new loans and investments exceed the funds available, Federal Funds are purchased. In contrast, if new loans and investments are less than funds available, Federal Funds are sold subject to the limits discussed earlier.

Decision Alternatives

Each member of the your bank's management team should jot down preliminary decisions prior to the initial period of play. You will need to collaborate with the rest of your bank's management team before a final set of decisions for the first six-month period are made. Your first set of decisions will be for period 1 (2009.0 in this example). The decisions are described below. An

example decision form can be found in Figure 2, which is a screen capture of the decision input form from the Ag Bank Sim game. Your bank manager will enter your team's decisions, and then each member will have the opportunity to approve or disapprove the decisions.

Interest Rates

Loan Interest Rates

The first five lines provided in the **Interest Rates** category (Figure 2) are where a bank management team enters the interest rates they wish to charge on new loans of each type in the coming period, expressed as an annual percentage rate. Interest on all loans is accrued and posted on a six-month basis in the income statement. The loan types are described below.

1. *Ag Production* is a one-year agricultural production loan with one lump sum principal payment at the end of the year.
2. *Ag Real Estate* is a ten-year agricultural real estate loan with ten equal principal payments.
3. *Real Estate* is a ten-year real estate loan with ten equal principal payments.
4. *Commercial* is a two-year loan with one-half of the principal repaid at the end of each year.
5. *Consumer* is a two-year loan with one-fourth of the original principal repaid each six-month period.

Lower interest rates relative to other banks in the county (all other things equal) will tend to increase the volume of new loans made by your bank. There is no guarantee, however, that a bank will be able to make as many new loans as desired. For example, a bank may hope to make more agricultural production loans than the market volume equations will allow. In addition, other

banks in the county may have competitive interest rates, advertising expenses, and loan officer salaries, or make other decisions that affect the amount of new loans.

Deposit Interest Rates

On the next four lines (**Interest Rates** category, Figure 2), enter the average interest rate the bank management team wishes to pay in the coming six-month period on all deposits in the following categories, expressed as an annual percentage rate:

1. *NOW* accounts are Negotiable Orders of Withdrawal.
2. *MMDA* accounts are Money Market Deposit Accounts.
3. *Savings* refers to the typical bank savings deposit accounts.
4. *CD* represents all sizes and maturities of Certificates of Deposit. (CD rates may not be changed more than 0.5% from one period to the next.)

Paying higher average annual interest rates on deposits, relative to competing banks, will tend to attract more deposits to your bank. No maximum deposit interest rates are specified in the model, but the bank must be able to loan or invest the funds at rates above those paid on deposits for the decisions to be profitable.

Maximum New Loans and Investments

Max New Loans Desired

On the five lines provided (**Max NewLoans Desired**, Figure 2) enter the maximum dollar amount of new loans in each category that your bank would like to make in the coming six-month period.

1. *Ag Production*
2. *Ag Real Estate*
3. *Real Estate*

4. *Commercial*
5. *Consumer*

These figures do not represent the amount of new loans your bank will make in the next period, but set the maximum amount desired by your bank. The bank may receive fewer new loans than desired, particularly if other banks have lower interest rates, more favorable loan officer salaries, and higher advertising expenses. That's the way it is in the real world—you may wish to make millions of dollars in new loans, but if customers are not interested, you will have funds you cannot loan out. If your bank management team does not wish to emphasize a particular type of loan, you would reflect this decision by entering a low dollar figure, perhaps $50,000, on the appropriate line for the loan type. Do not enter a zero as a desired amount for any loan type. If the new loan volume available to your bank exceeds the amount your bank management team entered on the decision form, the bank will receive only the amount entered on the decision form, that is, your bank can receive no more new loans than it desires**.** In addition, your bank can take all the loan volume allowed by market conditions and your decisions by entering a very large number on the decision form. For example, an entry of $10,000,000 on each line will allow your bank to make the maximum amount of each loan type that market conditions and your bank decisions allow for the coming six-month period.

New Investments

On the next five lines provided **(New Investments,** Figure 2), enter the dollar amounts of the investments your bank will purchase in the next period:

1. *Six-month Government securities*, which mature after six-months.
2. *One-year Government securities*, which mature after one year.
3. *Three-year Government securities*, which mature after three-years.

4. *Two-year Municipal bonds*, which mature after two-years.
5. *Five-year Municipal bonds*, which mature after five-years.

The amount of each new investments specified on the decision form will be purchased by your bank. The initial $300,000 of interest income earned each year from municipal bond investments (the summation of interest income from both the two-year and five-year municipal bonds) is exempt from state and federal income taxes. Income above that amount is taxed at corporate income tax rates (Table 7).

Other Decisions

On the five lines in the **Other Decisions** category (Figure 2), make entries for the remaining decisions:

1. *Service Charge* should be expressed as a percent and it is applied to the total of the transaction deposits (DDA, NOW, MMDA). All banks impose some type of service charges, so the minimum service charge is 0.25 percent. There is no upper limit, but few banks have service charges that exceed 1.0 percent. Higher service charges relative to your bank's competitors make maintaining current deposits and attracting new deposits more difficult.
2. *Advertising* should be expressed as a dollar amount to be spent by your bank on advertising and promotion during the coming six-month period. Advertising will help determine the level of new loans and deposits obtained by a bank in the coming period. Advertising above the county average has a positive effect on deposits and loans, but the magnitude of the effect varies for each deposit and loan type.

Advertising outlays may be set at any dollar level, but there is a saturation point beyond which additional advertising fails to generate additional loans and deposits.

3. *Number of loan officers* to be employed by the bank during the coming six-month period should be expressed as a whole number. The number of loan officers employed, and changes in the number of officers relative to competing banks, will influence the volume of new loans obtained. Reducing the number of loan officers reduces your bank's ability to make new loans. The magnitude of the effect, however, differs for each type of loan.
4. *Average loan officer salary* should be expressed as an annual dollar amount. One-half of the total salaries for loan officers is paid in each six-month period. Higher salaries reward loan officers for increased productivity. Banks with salaries higher than the county average salaries are likely to increase their loans relative to their competitors. There is no maximum salary specified for the game. However, if salaries increase more than earnings, net income for the bank will decline.
5. *Average employee salary* should also be expressed as an annual dollar amount. One-half of total employee salaries is paid in each six-month period. Higher employee salaries have a positive effect on the level of deposits attracted by the bank. However, earnings must increase enough to pay those higher salaries.

Investment Sales

On each row of the table at the bottom of the Decision Form (Figure 2), you can enter one decision to sell part or all of an investment currently in the bank's portfolio. Information useful in making decisions to sell current investments is shown in Tables 3 and 5 of the Bank Simulation

output. The amounts of each investment type, when they were added to the portfolio and their interest rates are shown in Table 5. As discussed previously, the schedule of maturing assets over the next four years is shown in Table 3. Notice that investments maturing at the end of the current period are shown in Table 3 in the column with 2008.5 as the heading. The $4,000,000 in 6-month government securities purchased last period matures now and this $4,000,000 is available for new loans or investments this period. The $3,000,000 in 1-Year Government securities purchased, as Table 5 indicates, in period 2008.0 matures this period and appears at the bottom of Table 3 as available under the 2008.5 heading. Since these investments have matured, and are included in estimating the funds available for new loans and investments, they cannot not be sold. Conversely, the $4,000,000 in 1-Year Government Securities, which Table 5 indicates were purchased in period 2008.5, and which appear in Table 3 under the column heading 2009.0, do not mature this period and can be sold. Likewise, none of the 3-Year Government Securities, 2-Year Municipal Bonds, or 5-Year Municipal Bonds matures this period, and any of them can be sold this period. Let us assume you decide to sell the $550,000 of 5-Year Municipal Bonds that were added to the portfolio in 2004.5 (Table 5). This sell decision would be shown on the Decision Form (Figure 2) by entering "$550,000" on the 2004.5 line in the "5 Yr. Mun." section. Additional sell decisions should be entered in a similar fashion on subsequent lines, using the periods and amounts for each investment from Table 5. Remember that if your bank sells the $550,000 of 5-Year Municipal Bonds, it must do so at a 2 percent discount, which means your bank, will have $539,000 in additional funds available for investment, not $550,000. This money will need to be included on line 4 of the **Estimation of Funds Available for Loans and Investments**. If no investments are to be sold, this section of the decision form can be left blank.

Income Taxes

The bank is a corporation and income is taxed using the federal corporate income tax schedule found in Table 7. To establish the appropriate tax for the six-month period, taxable income is projected to a yearly basis by multiplying the six-month taxable income by two. Then, the appropriate amount of tax for the year is calculated and divided by two to convert back to the six-month period. The first $300,000 per year in interest income from municipal bonds is exempt from taxes and is not included in the calculated taxable income. Any interest income from municipal bonds over $300,000 is taxable. While, the approach taken to calculate taxes in Ag Bank Sim is somewhat simplified (the actual amount of income tax would generally be determined using an alternative minimum tax approach), it provides a reasonable approximation of the tax situation faced by rural corporate banks.

Reserve Requirements and Federal Funds

As was discussed briefly in an earlier part of the text, the bank's cash and reserves must meet or exceed the computed reserve requirement. The reserve requirement used in the simulation is three percent of the first $42.2 million of transaction deposits (DDA, NOW, MMDA) and ten percent of transaction deposits over $42.2 million. If the bank has cash in excess of the reserve requirement, Federal Funds are automatically sold up to 100% of the bank's total equity. If the bank's level of cash is greater than the reserve requirement plus 100% of equity capital, then this excess cash is not invested in Federal Funds and does not earn interest. If the bank does not have enough cash to meet the reserve requirement, Federal Funds are automatically purchased. The bank is allowed to borrow at the Federal Funds rate up to the level of total securities. If more than

this amount is needed, additional borrowing will occur at one and one-half times the Federal Funds rate for the period.

Capital Requirements

The Ag Bank Sim game requires that the bank's capital-to-asset ratio be equal to or greater than five percent. If the ratio falls below five percent, a warning message is printed, and additional loans are discouraged until the ratio again exceeds five percent. The initial capital-to-asset ratio, calculated from total equity capital and total assets in Table 1, is 11.58%. (6,568,000/56,728,000 = 0.1158)

Getting Started

The Ag Bank Sim Game is Internet based and is paperless except for notes you may make and/or assignments you have to turn in. You must register as a student at www.agbanksim.org (Figures 3 and 4). Be sure to create your account using the email address you will actively monitor for email notifications. The instructor will provide you with a game number. (This may be before or after you create your account, depending upon the situation.) Join the game using the game number provided (Figure 5). Be sure to "join the game" well before play is to begin. Once you have joined the game, the instructor will assign you to a team. One person, in your bank management team, will be assigned the position of bank manager and ultimately "ok" your team's decisions. The instructor will also announce the decision deadlines for each period of play. If decisions are not made in a timely fashion, the instructor will assign decisions for you that may not be profitable for your bank!

Email communications with the instructor and your team members will keep you informed about happenings in the game. The bank manager has the task of entering the team's decisions. Once your bank manager has submitted decisions for a period, you will receive an email like the one shown in Figure 6. Upon receipt of this email, you will then need to login to review the decisions. Figure 7 shows the decision approval/disapproval screen. Click on thumbs-up to approve or click on thumbs-down to disapprove your team's decisions; only do this after you have reviewed the decisions. Failure to review the decisions thoroughly could cause your bank to make less than optimal decisions. Note that you may email other team members, including the bank manager, to discuss decisions. Be sure the bank manager makes amendments to decisions prior to the deadline. The instructor will then run the simulation and notify all participants when it is time to review simulation results generated from your bank's most recent decisions. You may then begin to consider decisions for the next period.

What Should Your Bank Management Team Accomplish

Your bank management team's ultimate goal should be to gain an appreciation of the decision management process used by commercial banks to make their bank successful. As a student, you should hope to develop a better understanding of basic banking concepts (for example, loan pricing, setting deposit rates, investment decisions -buying and selling-, reacting to competitor's decisions, etc). To do this, we have created a set of awards that your bank can earn at the conclusion of the Bank Simulation Game. The awards that your bank may earn are:

1. *Outstanding Bank Award* is awarded to the bank that has the best-combined performance in terms of profitability, loan to deposit ratio, total deposits, total loans, and municipal bonds. The weight given to each factor is based on a survey of rural bankers.

2. *Runner-up Outstanding Bank Award* is awarded to the bank that finishes second in this award category.

3. *Most Profitable Bank Award* is awarded to the bank that has the highest cumulative net income.

4. *Second Most Profitable Bank Award* is awarded to the bank that has the second highest cumulative net income.

5. *Farmer's Friend Bank Award* is awarded to the bank that generates the most new loans to farmers, i.e. the summation of all new agriculture production and agriculture real estate loans over the 2-year period.

6. *Most Improved Bank Award* is awarded to the bank that has the most improvement in net income between the first two and last two periods of play.

7. *Good Neighbor Bank Award* is awarded to the bank that purchased the most municipal bonds.

8. *Coupon Clippers Bank Award* is awarded to the bank that purchased the most securities.

9. *Loan Loss Blues Bank Award* is awarded to the bank that has the largest cumulative amount of loan losses in dollars.

Table 1. Balance Sheet (Screen Shot of the Output Generated from Ag Bank Sim)

Oklahoma Bank Simulation Game

Table 1. BALANCE SHEET

County 1 Bank 1 Year 2008.5

ASSETS			LIABILITIES		
Cash and due from		586,872	Deposits		
Securities:			DDA deposits	6,520,800	
Six Month Gov	4,000,000		NOW deposits	9,028,800	
One Year Gov	7,000,000		MMDA deposits	4,012,800	
Three Year Gov	7,000,000		Savings deposits	2,508,000	
Two Year Mun	2,000,000		CD deposits	28,089,600	
Five Year Mun	4,050,000				
Total Investment Securities		24,050,000	Total Deposits		50,160,000
Federal Funds Sold		2,716,406	Federal funds purchased		0
Loans:					
Ag Production	11,797,880		Total Liabilities		50,160,000
Ag Real Estate	4,213,660				
Real Estate	6,362,804		Stockholders' equity capital		
Commercial	2,384,418		Capital and Surplus		2,000,000
Consumer	4,415,960		Retained earnings		4,568,000
Total Loans		29,174,722			
Bank premises and equipment		200,000	Total Equity Capital		6,568,000
Total Assets		56,728,000	Total Liabilities and Equity		56,728,000

Capital to Assets	11.58%
Total Loans to Total Deposits	58.16%
Investments to Total Assets	42.40%

Table 2. Income Statement (Screen Shot of the Output Generated from Ag Bank Sim)

Table 2. INCOME STATEMENT

County 1 Bank 1 Year 2008.5

INCOME			DETAIL ON SELECTED ACCOUNTS		
Interest on Loans	1,570,234.70		Interest On Loans		1,570,234.70
Interest on Investments	687,850.00		Ag Prod	635,883.39	
Interest on Fed Funds	88,283.19		Ag Real Estate	210,007.74	
Service Charge	97,812.00		Real Estate	318,884.15	
Total Income		2,444,179.90	Commercial	126,149.95	
			Consumer	279,309.47	
EXPENSES			DEPOSIT EXPENSE		847,704.00
Deposit Expense	847,704.00		NOW	135,432.00	
Fed Fund Expense	0.00		MMDA	68,217.60	
Advertising	15,000.00		Savings	40,128.00	
Officer Salary	80,000.00		CD	603,926.40	
Employee Salary	200,000.00				
Other Expense	652,372.00				
Loan Losses	0.00				
Total Expense		1,795,076.00			
Less Taxes		177,073.32			
NET INCOME (this period)		472,030.57			
Total Accumulated Income		0.00			

LOAN CHARGE-OFF INFORMATION

	Dollar Amount	Charge-off	Historical From	Range To
Ag Production	0	0.000	0%	1.116%
Ag Real Estate	0	0.000	0%	1.515%
Real Estate	0	0.000	0%	2.280%
Commercial	0	0.000	.2%	7.935%
Consumer	0	0.000	.4%	3.735%

Table 3. Decisions Input (Screen Shot of the Output Generated from Ag Bank Sim)

Table 3. DECISIONS INPUT

County 1 Bank 1 Year 2008.5

Interest Rates			Maximum	Actual
NOW	3.00%	Ag Production	10,000,000	6,597,880
MMDA	3.40%	Ag Real Estate	1,500,000	384,060
SAV	3.20%	Real Estate	1,500,000	588,300
CD	4.30%	Commercial	3,000,000	788,006
Ag Prod	11.00%	Consumer	4,000,000	1,766,384
Ag Real Est	10.40%	Investments Purchased		
Real Estate	10.40%	Six Month Gov	4,000,000	
Commercial	11.00%	One Year Gov	4,000,000	
Consumer	13.00%	Three Year Gov	500,000	
Other Decisions		Two Year Mun	500,000	
Service Charge	0.50%	Five Year Mun	0	
Advertising Level	15,000			
Average Officer Sal	40,000			
Average Employee Sal	20,000			
Number of Officers	4			

Maturing Assets -- next 4 years

Year	2008.5	2009.0	2009.5	2010.0	2010.5	2011.0	2011.5	2012.0
6 Mo Gov	4,000,000							
1 Yr Gov	3,000,000	4,000,000						
3 Yr Gov	0	2,000,000	500,000	2,000,000	2,000,000	500,000		
2 Yr Mun	0	1,000,000	500,000	500,000				
5 Yr Mun	0	550,000	0	1,000,000	0	1,500,000	0	500,000
AGPROD	5,200,000	6,597,880						
AGREL	379,804	386,316	341,498	348,010	303,192	309,704	264,886	271,398
REAL	568,439	597,509	513,439	532,509	455,939	470,009	395,939	410,009
COMML	801,606	788,006	400,803	394,003				
CONSUM	1,766,384	1,324,788	883,192	441,596				
Total	15,716,233	17,244,499	3,138,932	5,216,118	2,759,131	2,779,713	660,825	1,181,407

Table 4. Economic and Statistical Information (Screen Shot of the Output Generated from Ag Bank Sim)

Table 4. Economic and Statistical Information

County 1 Bank 1 Year 2008.5

				Percent Market Share		
				Bank 1	Bank 2	Bank 3
County Per Capita Income	18,000					
Retail Sales ($ Mil)	1.25					
Average land value	350		DDA	33.33	33.33	33.33
Index of new housing costs	156		NOW	33.33	33.33	33.33
Farm Price Index	120		MMDA	33.33	33.33	33.33
Futures Price of wheat)	3.00		SAVINGS	33.33	33.33	33.33
Average for county banks			CD	33.33	33.33	33.33
NOW Int.		0.00%				
MMDA Int.		0.00%	AGPROD	33.33	33.33	33.33
SAV Int.		0.00%	AGREL	33.33	33.33	33.33
CD Int.		0.00%	REAL	33.33	33.33	33.33
Ag Prod Int.		0.00%	COMML	33.33	33.33	33.33
Ag Real Estate Int.		0.00%	CONSUM	33.33	33.33	33.33
Real Estate Int.		0.00%				
Commercial Int.		0.00%				
Consumer Int.		0.00%				
Service Charge		0.00%				
Advertising		0				

Next Period

	Actual		Expected Range	FROM	TO
Fed Funds Rate	7.50%		Per Capita Income ($)	17,760	19,240
Six Month Gov	7.10%		Retail Sales ($ Mil)	1.23	1.36
One Year Gov	7.15%		Average Land Value ($/Acre)	371	410
Three Year Gov	7.15%		Index of new housing costs	151	167
Two Year Municipal	4.30%		Farm Price Index	118	131
Five Year Municipal	4.65%		Futures Price of wheat ($/bu)	3.09	3.41

Table 5. Outstanding Loans and Securities (Screen Shot of the Output Generated from Ag Bank Sim)

Table 5. Outstanding Loans and Securities
County 1 Bank 1 Year 2008.5

Year	Ag Real Estate Level	Ag Real Estate Int	Real Estate Level	Real Estate Int	5 Year Mun Level	5 Year Mun Int	3 Year Gov Level	3 Year Gov Int
1999.0	38,306	9.50%	55,000	9.50%				
1999.5	38,306	9.40%	65,000	9.35%				
2000.0	76,612	9.00%	115,000	9.30%				
2000.5	76,612	8.80%	125,000	9.25%				
2001.0	114,918	8.75%	180,000	9.20%				
2001.5	114,918	8.75%	180,000	9.25%				
2002.0	153,224	9.00%	235,000	9.15%				
2002.5	153,224	9.15%	245,000	9.10%				
2003.0	190,530	9.25%	270,000	9.25%				
2003.5	192,530	9.25%	284,524	9.40%				
2004.0	227,836	9.50%	330,500	9.65%	0	4.00%		
2004.5	231,836	10.00%	343,680	10.00%	550,000	4.20%		
2005.0	258,142	10.25%	395,000	10.25%	0	4.20%		
2005.5	278,142	10.30%	415,000	10.30%	1,000,000	4.30%		
2006.0	300,448	10.30%	455,000	10.30%	0	4.40%	0	6.30%
2006.5	312,448	10.50%	465,000	10.50%	1,500,000	4.30%	2,000,000	6.30%
2007.0	340,754	10.45%	515,000	10.45%	0	4.30%	500,000	6.32%
2007.5	348,754	10.50%	525,000	10.50%	500,000	4.40%	2,000,000	6.35%
2008.0	382,060	10.45%	575,800	10.45%	500,000	4.50%	2,000,000	6.35%
2008.5	384,060	10.40%	588,300	10.40%	0	4.20%	500,000	6.40%

Year	Commercial Level	Commercial Int	Consumer Level	Consumer Int	Ag Prod Level	Ag Prod Int	2 Year Mun Level	2 Year Mun Int	1 Year Gov Level	1 Year Gov Int
2007.0	400,803	10.00%	441,596	12.00%			0	4.00%		
2007.5	394,003	10.50%	883,192	12.50%			1,000,000	4.35%		
2008.0	801,606	10.50%	1,324,788	12.50%	5,200,000	10.50%	500,000	4.00%	3,000,000	6.25%
2008.5	788,006	11.00%	1,766,384	13.00%	6,597,880	11.00%	500,000	3.60%	4,000,000	6.20%

Table 6. Estimation of Funds Available for New Loans and Investments for Ag Bank Sim

				Period 1	Period 2	Period 3	Period 4
1	**Total Value of Maturing Assets (Table 3)**		$	15,716,233			
2	**plus Cash and Due From (Table 1)**	(+)		586,872			
3	**plus Anticipated Change in Deposits (Tables 1 & 4)**	(+ or -)		100,000			
4	**plus Cash from Sale of Investments (Table 5)**	(+)	$	-			
5	**plus Amount of Fed Funds Sold (Table 1)**	(+)		2,716,406			
6	**plus Projected Net Income After Taxes (Table 2)**	(+ or -)		475,000			
7	**minus Reserve Requirement (Table 1) 3% of Transaction Accounts (DDA+NOW+MMDA) up to $42.2 Million and 10% of amounts over $42.2 M**	(-)		586,872			
8	**minus Amount of Fed Funds Purchased (Table 1)**	(-)		-			
9	**Funds Available for New Loans and Investments**	(=)		$19,007,639			

Table 7. Federal Corporate Income Tax Rates Used in Ag Bank Sim

Taxable income over:	But not over:	The Tax is:	Of the amount over:
$ 0	$ 50,000	15%	$ 0
50,000	75,000	7500 + 25%	50,000
75,000	100,000	13,750 + 34%	75,000
100,000	335,000	22,250 + 34%	100,000
335,000	10,000,000	113,900 + 34%	335,000
10,000,000	15,000,000	3,400,000 + 35%	10,000,000
15,000,000	18,333,333	5,150,000 + 38%	15,000,000
18,333,333	-----	35%	0

Figure 1. Ag Bank Sim Operations Overview

Bank financial position is given and, initially, each bank has equal assets, liabilities, equity capital, and an equal share in a county's market:

Bank Assets	Bank Liabilities
Cash and due from Securities Fed Funds sold Loans • Ag production • Ag real estate • Real estate • Commercial • Consumer Bank premises and equipment	Deposits • DDA • NOW • MMDA • Savings • CD Fed Funds purchased Stockholders equity capital Capital and surplus Retained earnings

Future income and market share is determined by the economic environment (per capita income, retail sales, etc.), the decisions your competitors make, and the decisions you make:

Management options:	Sources of funds:	Uses of funds:
Interest rates on loans • Ag Production • Ag Real Estate • Real Estate • Commercial • Consumer Interest rates on deposits Number of loan officers Loan officer salaries Salaries for other employees Advertising expense Volumes of new loans and investments Service charge	Maturing assets • Loans ○ Ag production ○ Ag real estate ○ Real estate ○ Commercial ○ Consumer • Investments ○ 6-mo. gov. ○ 1-year gov. ○ 3-year gov. ○ 2-year muni. ○ 5- year muni. Cash and due from (receivables) Change in deposits Sale of investments Fed funds purchased (borrowed)	Cash and reserve requirements Loans • Ag production • Ag real estate • Real estate • Commercial • Consumer Investments • 6-mo. gov • 1-year gov. • 3-year gov. • 2-year muni. • 5-year muni. Fed funds sold (loaned)

Figure 1. Ag Bank Sim Operations Overview (Continued)

Constraints on decisions:

- Cash in excess of reserve requirements results in sale of Fed Funds up to 100% of equity capital. Beyond that, excess cash earns no interest.
- Insufficient cash to meet operating cash and Federal Reserve requirements on deposits, results in Fed Funds purchases as needed up to the level of total investment securities. Beyond that, the rate for additional Fed Funds is 1.5X the current rate. Fed funds purchased must be repaid the next period.
- If the capital-to-asset ratio falls below 5 percent, new loans may be restricted until the capital-to-asset ratio returns to 5 percent.
- Reserve requirements equal 3% of the first $42.2 million of transaction deposits (DDA, NOW, MMDA) and 10% of transaction deposits over $42.2 million.

Other notes:

- While relative risk varies by type of loan, loan charge-offs are random within a given period.
- Actual interest rates may differ each period of play.
- There is no guarantee that a bank will make as many new loans as desired.

Figure 2. Online Decision Form for Ag Bank Sim (Screen Shot)

- Decisions

You are a member of this bank

Your bank manager has not yet saved any decisions for this period. Once saved and submitted, you will have the opportunity to submit your approval.

Interest Rates

Loan Interest Rates (%)	2008.5	2009.0	2009.5	2010.0	2010.5
Ag Production	0.00%	0.00%			
Ag Real Estate	0.00%	0.00%			
Real Estate	0.00%	0.00%			
Commercial	0.00%	0.00%			
Consumer	0.00%	0.00%			

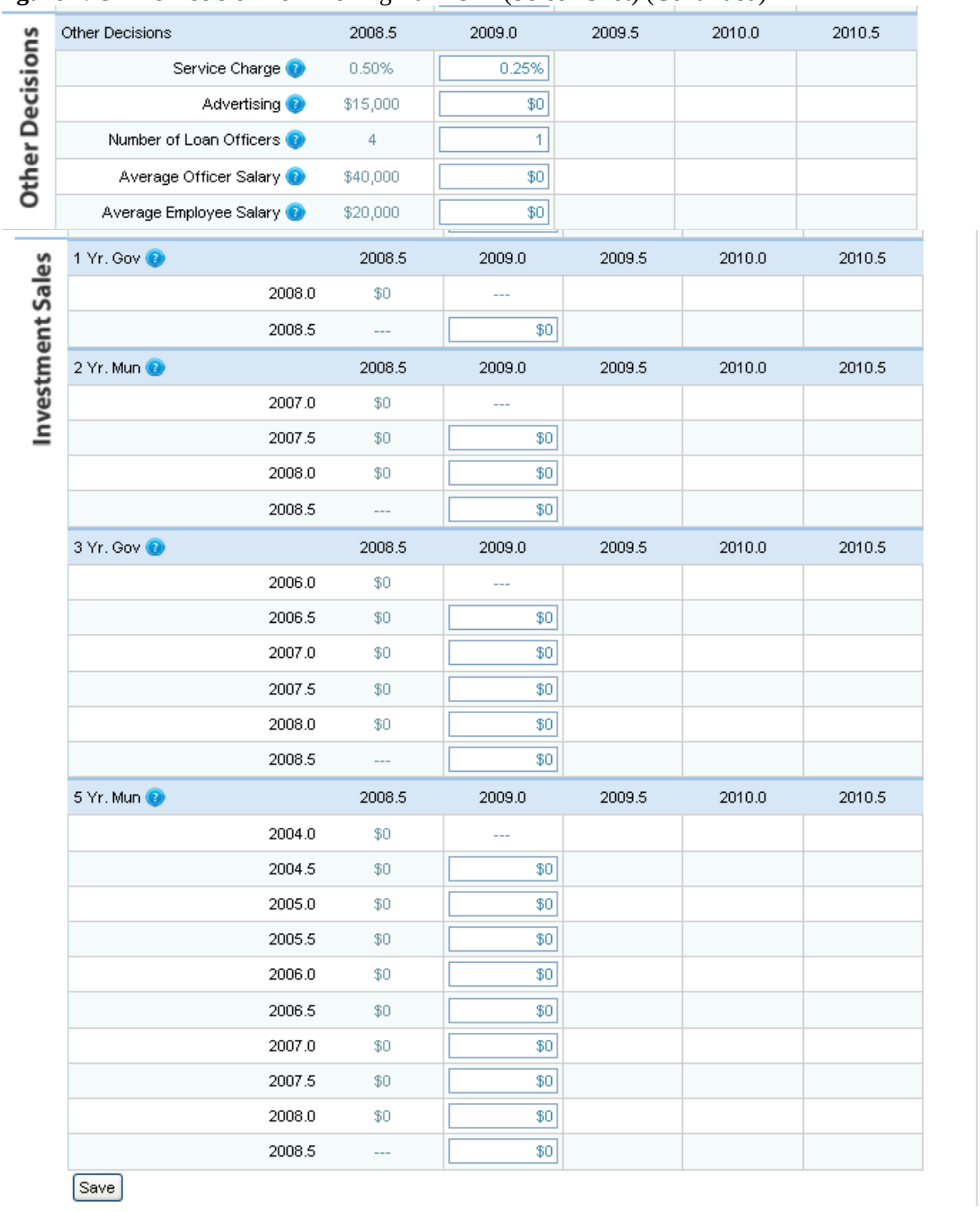
Deposit Interest Rates (%)	2008.5	2009.0	2009.5	2010.0	2010.5
NOW	0.00%	0.00%			
MMDA	0.00%	0.00%			
Savings	0.00%	0.00%			
CD	0.00%	0.00%			

Max New Loans & Investments

Max New Loans Desired	2008.5	2009.0	2009.5	2010.0	2010.5
Ag Production	$0	$0			
Ag Real Estate	$0	$0			
Real Estate	$0	$0			
Commercial	$0	$0			
Consumer	$0	$0			

New Investments	2008.5	2009.0	2009.5	2010.0	2010.5
6 Month Government	$0	$0			
1 Year Government	$0	$0			
3 Year Government	$0	$0			
2 Year Municipal	$0	$0			
5 Year Municipal	$0	$0			

Figure 2. Online Decision Form for Ag Bank Sim (Screen Shot) (Continued)



Other Decisions

Other Decisions	2008.5	2009.0	2009.5	2010.0	2010.5
Service Charge	0.50%	0.25%			
Advertising	$15,000	$0			
Number of Loan Officers	4	1			
Average Officer Salary	$40,000	$0			
Average Employee Salary	$20,000	$0			

Investment Sales

1 Yr. Gov	2008.5	2009.0	2009.5	2010.0	2010.5
2008.0	$0	---			
2008.5	---	$0			
2 Yr. Mun	**2008.5**	**2009.0**	**2009.5**	**2010.0**	**2010.5**
2007.0	$0	---			
2007.5	$0	$0			
2008.0	$0	$0			
2008.5	---	$0			
3 Yr. Gov	**2008.5**	**2009.0**	**2009.5**	**2010.0**	**2010.5**
2006.0	$0	---			
2006.5	$0	$0			
2007.0	$0	$0			
2007.5	$0	$0			
2008.0	$0	$0			
2008.5	---	$0			
5 Yr. Mun	**2008.5**	**2009.0**	**2009.5**	**2010.0**	**2010.5**
2004.0	$0	---			
2004.5	$0	$0			
2005.0	$0	$0			
2005.5	$0	$0			
2006.0	$0	$0			
2006.5	$0	$0			
2007.0	$0	$0			
2007.5	$0	$0			
2008.0	$0	$0			
2008.5	---	$0			

Save

Figure 3. Home Screen for Ag Bank Sim(Screen Shot)

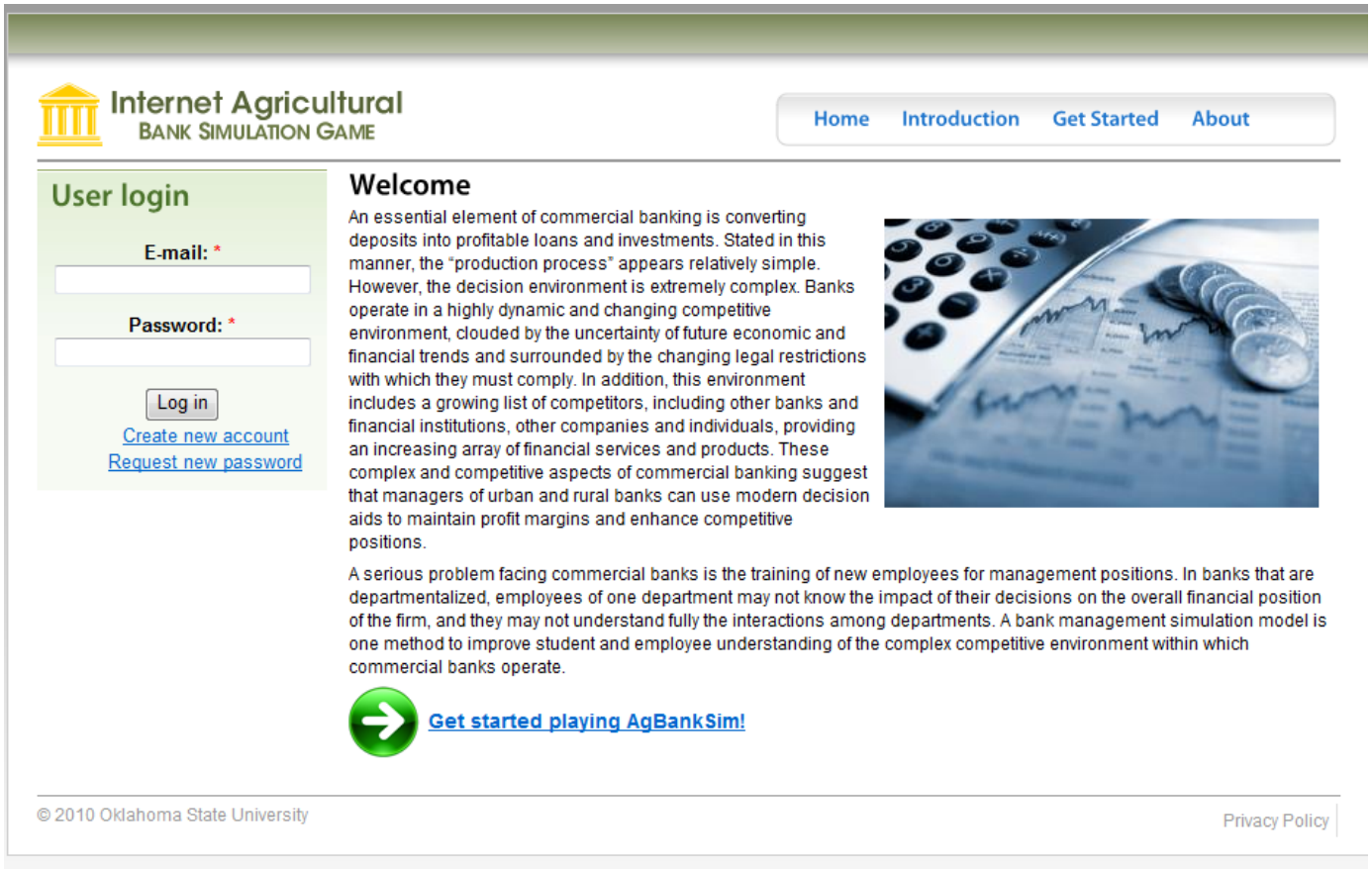


Figure 4. Registration Screen for Ag Bank Sim (Screen Shot)

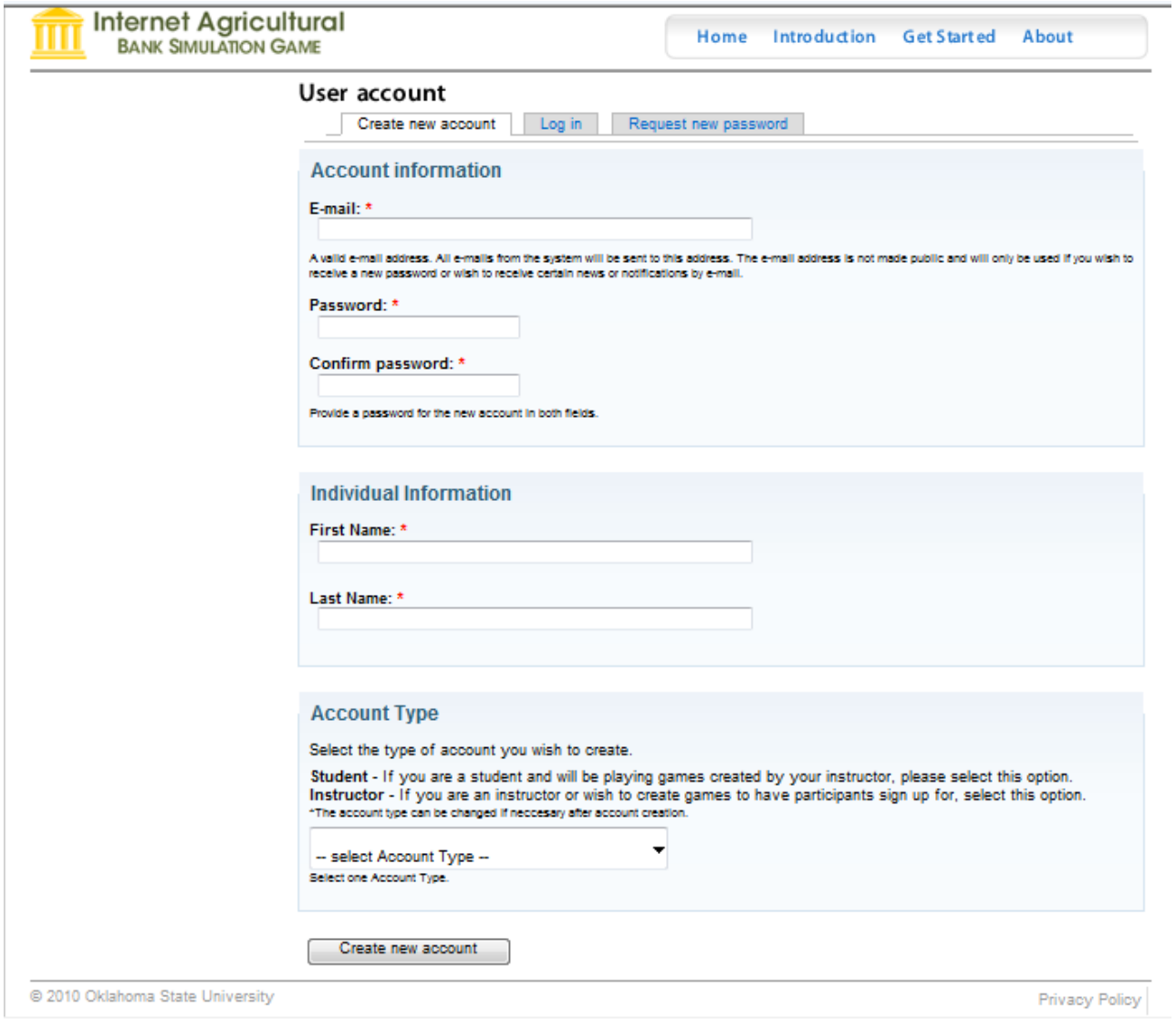


Figure 5. Joining a New Game Screen for Ag Bank Sim (Screen Shot)

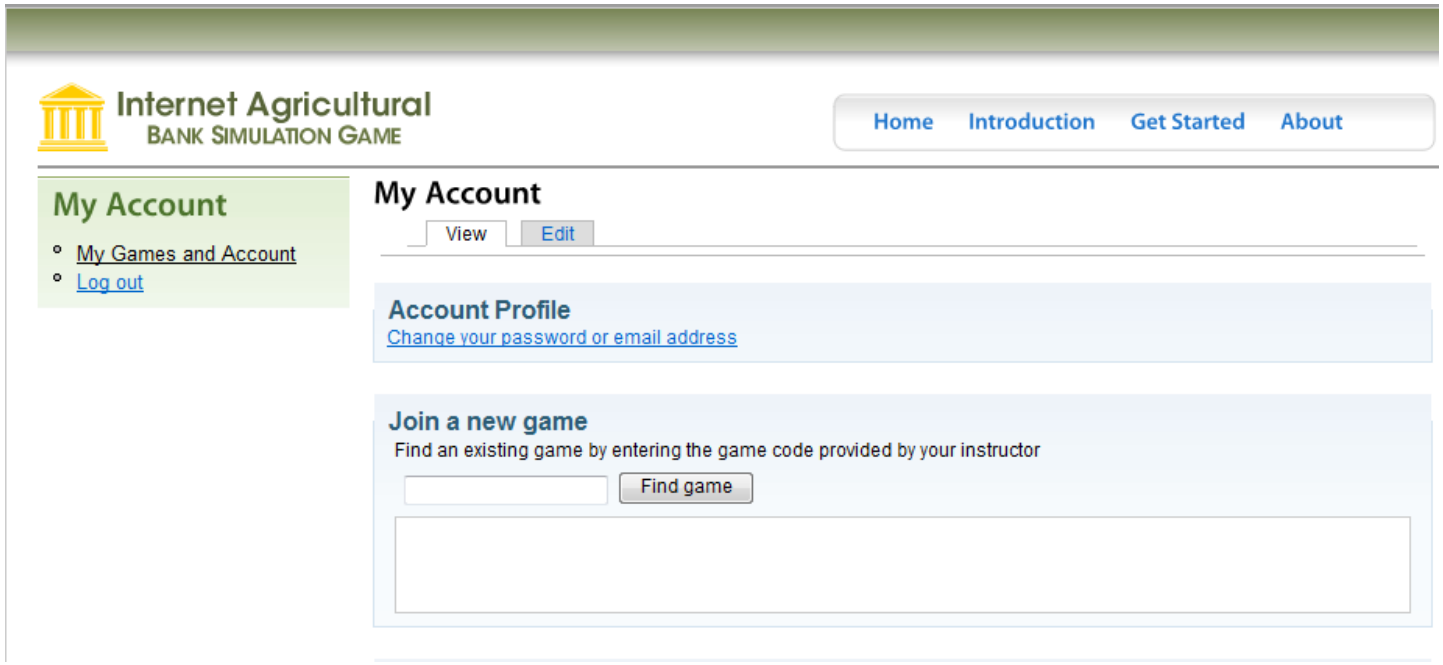


Figure 6. Email Notification that Bank Manager has Submitted Decisions for Ag Bank Sim (Screen Shot)

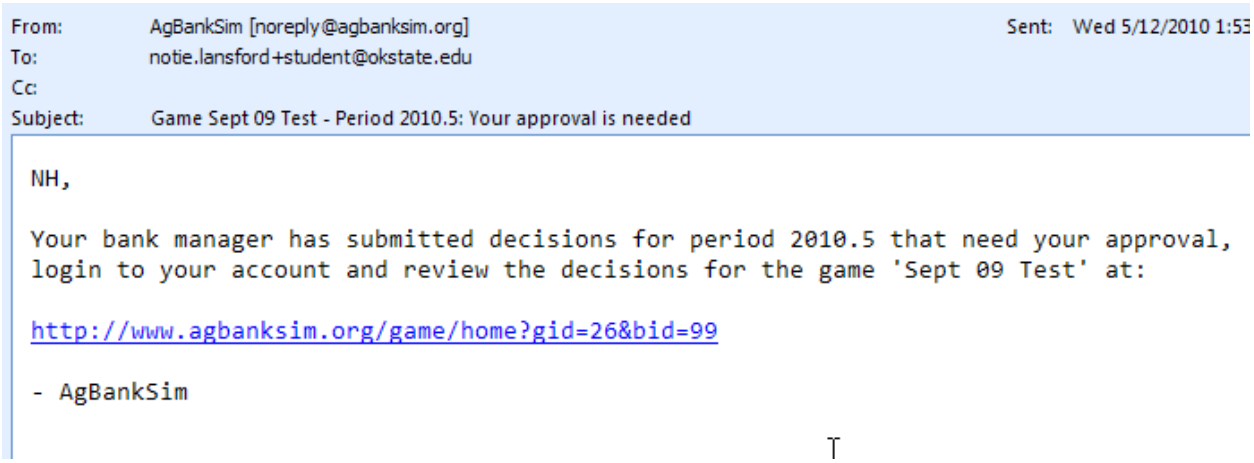


Figure 7. Approval or Disapproval of Decisions for Ag Bank Sim (Screen Shot)