THE STANFORD BANK GAME

VERSION 12b

INSTRUCTOR'S MANUAL

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PREFACE

Use this manual for both the US and International English editions of The Stanford Bank Game (SBG). The underlying processing program/model for both editions is identical; selected terms will differ in the reports and students manual.

Appendix A provides a listing of the differences in terminology. When terms that are different for the US and International versions are used, the US version terminology is shown first, followed by the International English terminology in parenthesis in italics: for example, Federal Funds *(LIBOR Funds)*.

We encourage your input, suggestions, or ideas.

Version 12 is a major departure from earlier editions of SBG as the new spreadsheet file allows instructors to do more with SBG. We hope all clients will be generous in sharing material that employ this feature and be willing to make such material available to other users of the game.

The website for SBG is www.hrwinc.com. **Please include "SBG" in the header of your e-mail to bankgame@hrwinc.com.**

INTRODUCTION

The Stanford Bank Game (formerly known as the Stanford Bank Management Simulator or SBMS) is a Microsoft® Windows™ program that runs on a personal computer. It simulates the operations of a commercial bank, based on the decisions of management teams. The program is designed to be used as a training device to give current and future managers of financial institutions a working knowledge of the financial interrelationships within a commercial bank. Participants make short-term operating decisions while at the same time considering the implications of these decisions for long-term growth and profitability. Although the relationships in the program are idealized and do not necessarily reflect the particular operations of any actual bank or class of banks, participants work with a fairly complex and realistic model and are challenged to make optimal decisions within this framework.

The basic operational unit of the game is the individual bank. The basic time unit is the calendar quarter. No seasonal patterns exist. In each quarter of the game, SBG computes the earnings and operating results for each bank by processing the decisions of the participating banks, the financial positions of the banks at the start of the quarter, and the economic data specifying the operating environment.

At the end of each quarter, the program generates several reports: the Instructor's Report, which summarizes the performance of each bank, and individual reports for each bank, which give that particular bank's financial position and the composition of its loan and investment portfolios as well as comparative information on all banks. Version 12 provides instructors with the option of creating a CSV file of the student decision (same data as in the PDF output report) that can easily be copied into a spreadsheet. The ending financial position of each bank in one quarter becomes that bank's starting financial position in the following period.

COMPONENTS OF THE STANFORD BANK GAME

The Stanford Bank Game is a self-contained package which consists of the following items that can be downloaded from the web site <www.hrwinc.com>.

1. Students Manual: This manual contains the information a participant needs to understand the operating environment of the simulation, to make the input decisions, and to interpret the output reports. Ratios or terms used in the simulation are defined in the manual.

2. Instructor's Manual: This manual contains information about the Instructor's Report and the operations of the simulation.

3. Program Model. The download is an installer with a trail/test version of SBG.

4. Supplemental student materials.

THE OPENING POSITION

The game begins for initial input with year 2, quarter 2 (2.2). In the reports for quarter 1.4 and 2.1 in the Students Manual and period 2.1 in the Instructor's Manual, Bank 1 represents the actual position of all of the banks at the beginning of the game. By studying the changes that have occurred from period 1.4 to 2.1, students can begin to learn how the game works even before their first decision must be made.

THE INSTRUCTOR'S MANUAL

INSTRUCTOR'S REPORT

Each quarter, SBG prints reports to help the instructor assess the performance of the individual banks. The Instructor's Report summarizes key factors that are useful in evaluating the performance of the individual bank teams. (See examples and definitions in Appendices B and C).

INSTRUCTOR OPTIONS

The instructor may operate Version 12 in one of two ways:

1. **The Partially Competitive Option:** Under this option, the banks compete only against the environment. The decisions of any one bank playing the game do not influence the results of the other banks.

2. **The Completely Competitive Option:** With this option, the banks compete both against the environment and against each other. The competing banks are assigned to sets of banks, called communities.

The competitive mode does not use a zero sum approach. In the competitive mode, the computer program first allocates loans and deposits based on the various interest rates offered or charged by the banks compared to "All Banks in the Economy." If the banks in the competitive community have substantive differences in their decision data, the model may adjust the loan and deposit allocations accordingly. In the competitive mode, a bank cannot lose more than 10% of the business it would have acquired in the non-competitive mode. Under certain circumstances, a bank may acquire a significant amount of additional business by taking a small percentage from all of the other banks. Generally, the competitive mode has only limited impact on the results of the game.

Most instructors use the partially competitive option for the first two or three quarters and then switch to the completely competitive mode when the participants are more familiar with the game. In any case, the instructor should tell the participants which option is being used.

Competitive Communities

You can run a maximum of eight banks in a single game, but only seven banks in a single competitive community. If you have nine or more teams, you will need to divide the teams into two separate games.

If you want to have a single winning team in a game with more than seven banks (the maximum in a single competitive community), you should run the program in the non-competitive mode for all groups. Remember, the teams in a community compete only against the other banks in their community and the environment. It is not entirely fair to compare the results between two competitive communities, because in the competitive mode a bad decision by one or two banks can create positive results for other banks in that community, but not in the other. If you want participants to compare or review the results in another game, distribute copies of pages 8, 9, and 10 from the other program.

If you do not need to have a single winning team, you can divide the teams into separate competitive communities, thereby reducing the amount of competitive data each team needs to analyze. In a single game, you can have two competitive communities, as long as each community has the same number of banks. If you have eight teams, you can divide the teams into two separate competitive communities of four banks each.

If you run a game with five or six banks in a community, the participants receive the optimum amount of data: enough to make their analysis meaningful, but not too much to be overwhelming. If you run a game

with less than four teams in a community, the participants may not have enough information to evaluate the computer data properly. SBG ships with two test games. If you only have enough students for one or two groups you can just overwrite the decisions in one of the test games and your students will have information on other banks.

Economic Data

At the heart of the model are parameters defining specific economic conditions during each quarter of simulation. Eight economic scenarios are included. You can play ten quarters—through period 4.4. Economies 1, 2, 3 & 4 are simplified. Economies 5, 6, 7 & 8 are variations on the first 4 but are more realistic and less predictable. They should be used with more advanced students. Economies 1, 2, 5 & 6 are low inflation. Economies 3, 4, 7 & 8 have slightly higher inflation rates.

RUNNING THE STANFORD BANK GAME

One unique aspect to the SBG software is that the only data that is saved is the student decision information. Every time you start a new game a new "decis **.sbg" file is created in the "bankgame" folder. There is a file called "gameini.sbg" that holds the general game setup information. You can open this file with any text reader like Notepad and you can see all of the information such as the bank names for any game you have. This information can be edited if the need arises. If you need to know which decision file is associated with a particular game just open the gameini.sbg. Data 01 corresponds with the decis01.sbg.

Every time you run a cycle with the SBG software all previous cycles are redone. So, there is seldom a need to save decision files as they are very easy to recreate.

Still a potential downside to this approach is that any modification to the decisions and to internal equations in SBG, when a game is in progress, changes data in earlier student reports.

HARDWARE AND SOFTWARE REQUIREMENTS

You should be able to run SBG on any current Windows operating system. SBG 12 is a 32 bit program.

INSTALLING THE PROGRAM

In today's security conscience environment almost all PC's that are not personally owned by an individual have features to protect the operating system. Even individually owned PC's if configured for a network may have protection. *You must have **full** administrative access to the PC in order to install the SBG program*. If you do not then you should have technically support do the install. Almost all of the issues we have encountered in the past few years with users installing the game have been related to security.

If you download the installer from the web site it installs a trial/test version. The game will run quarter 2.2 – it is not functional beyond 2.3. When you become an authorized user of SBG, we will e-mail you a fully functioning version..

It is a good idea to have tech support download the install SBG as some networks have security that prevent downloads. Running the setup.exe installs the program. **You cannot copy the SBG program from one computer to another, you must run an install.** Our install program contains a few Microsoft files that must be in the Windows system directory in order to run the SBG software.

When the installation is complete, you are returned to Windows. The Stanford Bank Game icon in a Stanford Bank Game program group appears. You can now start the program by choosing the Stanford Bank Game icon.

Once you become an authorized user and have received the fully functioning EXE from HRW, rename or delete the Trial/Test EXE; then load the new EXE we have sent you.

Before using SBG we suggest you create a subfolder "Originals" and place copies of the gameini.sbg ,decis99.sbg, and decis98.sbg in the SBG program folder, This allows you to easily go back to the original install position. We also suggest you create subfolder for your game files. SBG 12 generates a large number of files for the CSV (comma separated values) features.

STARTING THE PROGRAM
To start the program

1) Your PC and Windows Open

2) Choose the Stanford Bank Game icon. The Stanford Bank Game main window appears.
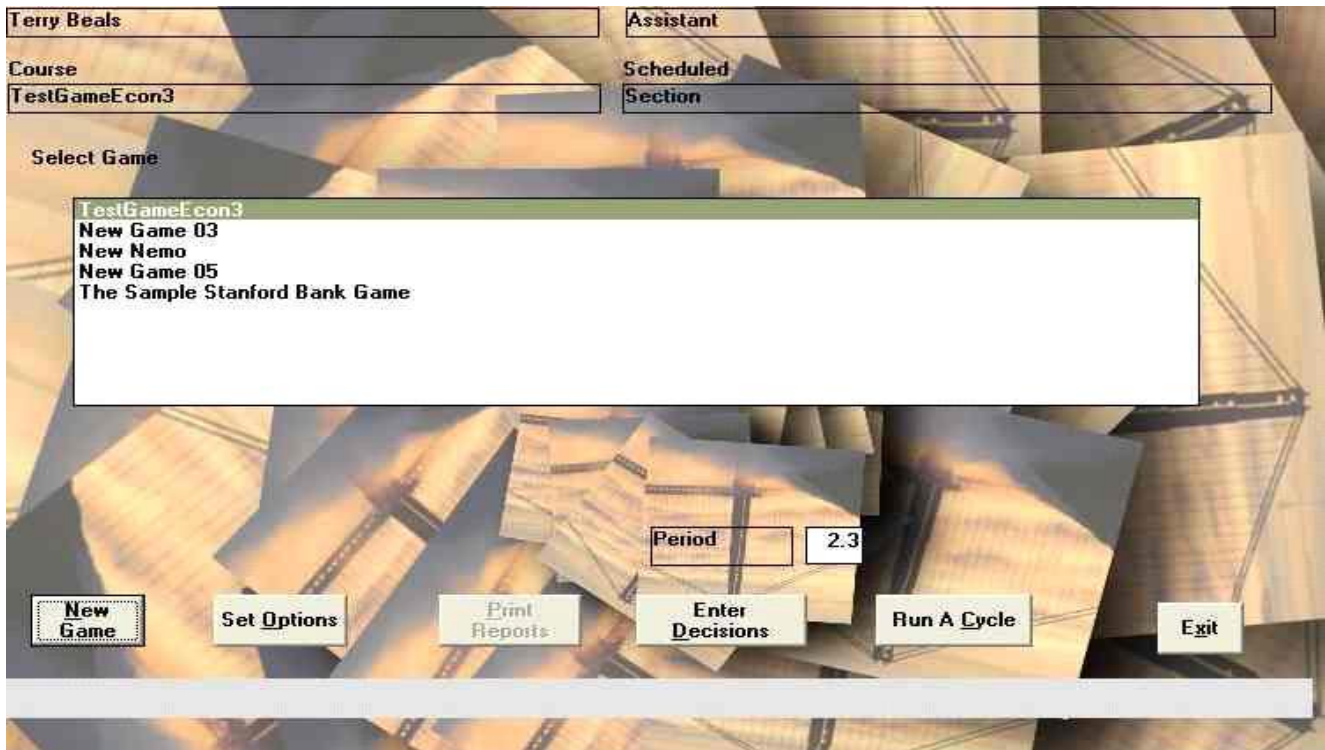
Stanford Bank Game Main Window

The main window displays the following information:

Course　　　　The name of the professor, the assistant, and the course, and the scheduled time for the
Information　　 selected game. You enter this information in the Options window when you start a new
　　　　　　　　　game.

Selected Game　The names of the bank games. You choose a name when you start a new game.

Period   The current period for the selected game. You can change the period by placing the cusor in this window and pressing the "+" or "-" keys

STARTING A NEW GAME

When you start a new game, you enter three sets of options: Course Identification, Bank Names, and Game Options. Before you run the first cycle of the game, you must also set the Print options.

To start a new game

1) Start the Stanford Bank Game as explained earlier, if it is not already running.

2) From the File menu, choose New Game. The Options window appears with the Course Identification tab on top.

Course Identification Tab, Options Window

To enter the Course Identification

1) Enter the following information in the text boxes:

Professor

Assistant

Course

Scheduled

Game

You can change this name if you want by typing directly in the text box.

Use the mouse or the TAB key to move between the text boxes.

2) Enter the Bank Names as explained next.

To enter the Bank Names

1) In the Options window, choose the Bank Names tab.

Bank Names Tab, Options Window

The Bank Names tab shows the name, number, and number of players for each bank.

2) Enter the following information in the text boxes:

Banks After each bank number, enter a name for the bank. The number of bank names that you enter sets the number of banks in the game.

Players After each bank number and name, enter the number of players for that bank. The number of players is used to determine the number of copies of the reports to print. It is usually easier to use a copier to make more than one copy.

To set the Game Options

In the Options window, choose the Game Options tab

Options Window

1)   Choose an economy. If you change the economy after you run one or more cycles, the results for all of the cycles are affected, even the quarters you have already run. If you change the economy, you will need to reprint and redistribute all reports from the period 2.2 on.

2)   Only Position 1 is currently available

3)   If you want to play in the competitive mode, select the Play in Competitive Mode option. When this option is selected, the competitive mode begins. Most instructors start the competition in period 2.4. You can highlight this box and change the quarter to start the competitive mode.

4)   A new allow speculation option was added. If this is not checked there is no student hedge decision. SBG automatically hedges each bank. If checked students have the option of adjusting the SBG calculation by a percentage.

      Warning: Once you have begun the competitive mode, you *cannot* return to the non-competitive mode. 4`)

To set the Print Options

1)   In the Options window, choose the Print Options tab.
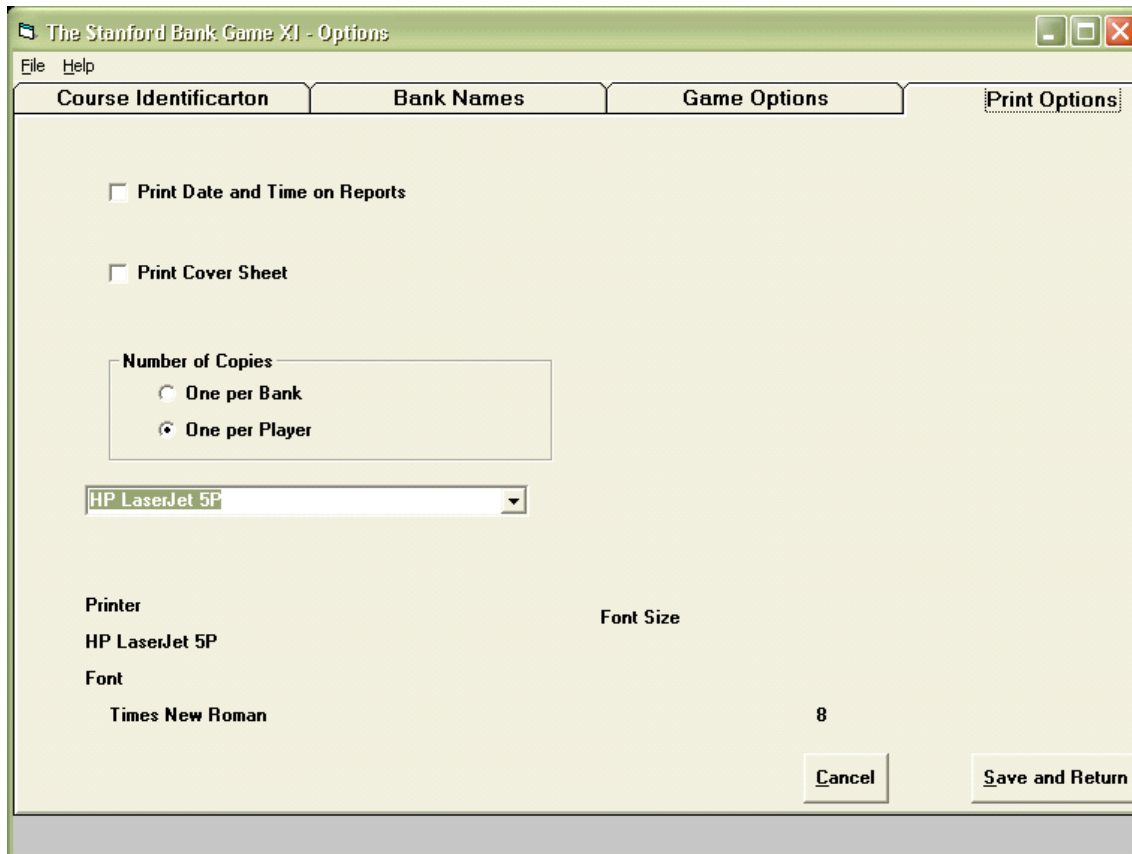
Print Options Tab, Options Window

*Note***:** The Print Options apply to all of the games, not just the current one. If you want different Print Options for a game, change the options before printing.

2) Set the following options by selecting the check boxes. The option is selected if an X appears in the box.

Print Date/Time on Reports If this option is selected, the actual calendar date and time that the report is printed appear on the report.

Print Cover Sheet If this option is selected, a cover sheet with the text entered under the Course tab is printed with the report.

3) Choose one of the following options by selecting the option button.

One Copy of Each Page If this option is selected, one copy of each page of the report is printed.

One Copy for Each Player If this option is selected, one copy of the report is printed for each player – this creates a very large print job that can be too large for some network printer setups..

Change Printer To change the printer or printer options, choose the Printer button. The Windows Printer dialog box appears.

ENTERING THE DECISIONS

After you have set up a new game, the first quarter for enterable decisions is 2.2. Enter your 2.2 decisions , and then run the cycle and print the reports. Each quarter, you repeat the same process; enter the decisions, run the cycle, print the reports.

Cycle 2.2

The Sample Stanford Bank Game

The Stanford Bank Game Bank

Bank 1	Bank 2	Bank 3	Bank 4	Bank 5

Commercial Loan Interest Rates		
Prime Loans Interest Rate	10.31	Range 8.81<->10.51
High Loans Interest Rate	11.24	Range 9.74<->11.54
Medium Loans Interest Rate	12.36	Range 10.85<->12.75
Consumer Loan Interest Rate	12.85	Range 10.35<->15.85
Real Estate Loans		
Interest Rate	10.65	Range 8.15<->13.65
Sell Old Loans	200	Range 0<->999
Sell Current Loans	0	0<->80 percent
Loan Policies		
General Credit Policy	0	
Letter of Credit Policy	0	
Service Charges, Fees and Credits		
Credit Card Fee	3.20	
Commercial Checking		

Discard Changes **Revert to Saved** **Save to Disk** **Save and Return**

Decisions Window

The Decisions window displays the following information:

Cycle	The current period for the game. You can change the period by highlighting this and pressing the plus or minus keys.
Game	The name of the bank game you selected in the main window.
Bank	The number of the bank whose tab is selected.
Decision Variables	The decisions. The decision variables and their allowable values are discussed in the Players' Manual. *If these are incorrect you can reset the game by running the prior cycle.*
Value	The values for the decision variables.
Remarks	The allowable ranges of values where appropriate.

The Decisions window has three command buttons:

Revert to Saved	Changes all the values to what they were before you last saved.
	For example, if you enter all of Bank 1 and part of Bank 2 and then choose Revert to Saved,

all of the decisions that you entered for Bank 1 and Bank 2 are replaced with the previously saved values. If you enter all of Bank 1 and choose Save to Disk, then enter part of Bank 2 and choose Revert to Saved, only the decisions that you entered for Bank 2 (since you last saved) are replaced with the previously saved values.

Save to Disk   Saves the values you have entered.

Save and Return Saves the values you have entered and returns to the main window.

To enter the decisions

1) Start the Stanford Bank Game as explained earlier, if it is not already running.

2) Select the game that you want to work on in the Stanford Bank Game main window. The window shows the game information and the current quarter. If you need to enter decisions for an earlier quarter, see the directions on Rerunning Previous Periods later in this manual.

3) Choose the Enter Decisions button in the main window or from the Edit menu, choose Decisions. Wait until the Decisions window appears.

4) Choose the tab for the bank whose decisions you want to enter. If there are more than five banks in the game, use the scroll bar to display the other bank tabs.

5) Use the mouse or the TAB key to move the cursor to the Value column after the Decision Variable that you want to enter.

6) Type the value in the box. The Remarks column indicates the allowable range of values where appropriate. For more information, see the description of the decision form in the Players' Manual.

7) Use the mouse, TAB key, or arrow keys to move the cursor to the next Value box and continue entering the values until the decision form is complete. All of the values do not appear on one screen; you will need to scroll down to enter all the values.

Note: TAB or ENTER moves the cursor to the next box in which you can enter data; SHIFT+TAB moves the cursor to the previous box.

1) Choose the Bank 2 tab to open the next bank and enter the decisions for that bank. Continue with the other banks until all of the decisions are entered. Choose Save to Disk frequently to save your work.

2) When you are finished, choose the Save and Return button to close the Decisions window and return to the main window.

There are activities that can confuse the counters SBG uses to identify the correct set of economic data, If the limits on loan rates do not agree with the pre-coded and expected economic data for the quarter you may not be able to enter data. This problem is corrected by rerunning the prior cycle as this resets the information.

RUNNING THE NEXT CYCLE
When you are satisfied with the decisions you have entered, you can run the next cycle of the game.
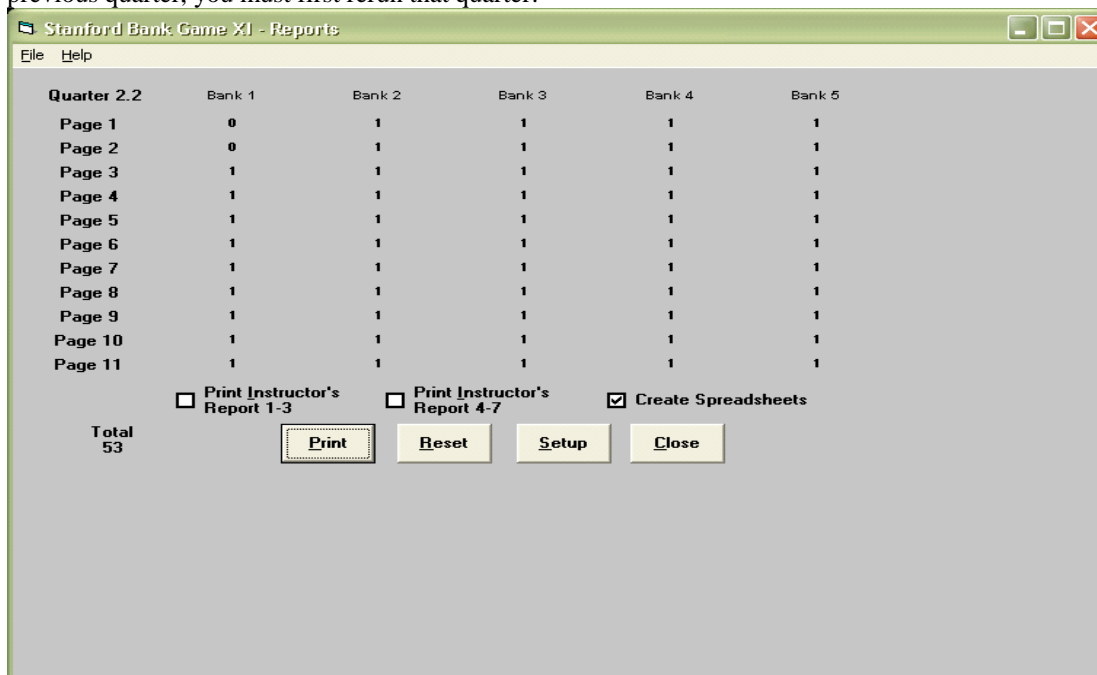**To run the next cycle**

- In the main window, choose the Run A Cycle button, or from the Run menu, choose Cycle.

When the cycle is completed, the Reports window appears. Print the reports as explained next or choose the Close button to return to the main window. *Printing a full set of reports is a very large print job and*

some networked printers may need to have the size of the cache file expanded. You can use the print pdf file option as a work around.

PRINTING THE REPORTS

After you have run a cycle of the game, you can print the reports for that cycle. To print the reports for a previous quarter, you must first rerun that quarter.

Quarter 2.2	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
Page 1	0	1	1	1	1
Page 2	0	1	1	1	1
Page 3	1	1	1	1	1
Page 4	1	1	1	1	1
Page 5	1	1	1	1	1
Page 6	1	1	1	1	1
Page 7	1	1	1	1	1
Page 8	1	1	1	1	1
Page 9	1	1	1	1	1
Page 10	1	1	1	1	1
Page 11	1	1	1	1	1

☐ Print Instructor's Report 1-3   ☐ Print Instructor's Report 4-7   ☑ Create Spreadsheets

Total 53

[Print] [Reset] [Setup] [Close]

Reports Window

The Reports window shows the number of copies that will be printed of each page for each bank. The default values appears when you open the window or when you choose the Reset button. The default values are determined by the numbers you entered in the Parameters window. For example, if you entered 5 players for Bank 1 and selected the option "One Copy for Each Player," a "5" appears after each page in the column under Bank 1.

The Reports window displays the following information:

Quarter   The report period.

Bank Number   The bank number.

Page Number   The report page number. The cell created by the bank number and page number shows the number of pages that will be printed of that page for each bank. NOTE you can disable single pages by clicking on that cell – page 1 & 2 for bank # 1 will not print in the above example. If you click on "bank 1" it will change the setting for all the pages for bank 1. If you click on "page 1" it will change all the settings for page 1.

Print Instructor's Select this option if you want to print the Instructor's Reports.
Reports

Create Spread   If checked you get a csv file for each bank. The csv file (s) will be identical to the regular

sheets　　　　　print report you have configured. So if you decide to only print one page from one bank, the csv file will only contain that page of information.

Total　　　　　The total number of pages that will be printed.

To Go　　　　　During the printing process, the number of pages remaining to be printed.

The Reports window has four command buttons:
Print　　　　　Starts the printing.

Reset　　　　　Resets all the numbers to the default values. After the Reset button is selected, it changes to the Zero button.

Zero　　　　　Sets all the values to zero. After the Zero button is selected, it changes to the Reset button.

Setup　　　　　Opens the Windows Printer dialog box.

Close　　　　　Closes the Reports window without printing.

To print the reports for the current quarter

1) After you run a cycle, the Reports window appears.

- If you want to change the Print Options before printing, choose the Close button to return to the main window. Then choose the Options button or, from the Edit menu, choose Options, and set the Print Options as explained earlier under Starting a New Game.

- If you have closed the Reports window after running a cycle, return to main window. Then choose the Print Reports button or, from the Run menu, choose Reports. The Print Reports button and Run Reports command are dimmed each time you start the program until you run a cycle of the game.

2) Set the number of reports you want to print, by doing any of the following:

- To enter the default values, choose the Reset button or from the File menu, choose Reset. After the Reset button is selected, it changes to the Zero button.

- To return to all zeros, select the Zero button, or from the File menu, choose Zero. After the Zero button is selected, it changes to the Reset button.

- Click on the bank number to toggle a column between zero and one.

- Click on the page number to toggle a row between zero and one.

- Type a number in the appropriate row and column.

The total number of pages to be printed appears at the bottom of the window under Total.

1) If you want to print the Instructor's Report for this period, select Print Instructor's Report. An X appears in the box when the option is selected.

2) If you need to change your printer setup, choose the Setup button or from the File menu, choose Printer Setup to open the Windows Printer dialog box.

3) Choose the Print button or from the File menu, choose Print. As the reports print, the number under To Go changes accordingly.

4) When the printing is complete, choose the Close button or from the File menu, choose Close to return to the main window.

THE REPORT

The Stanford Bank Game report has two sections for participants:

1) Information specific to *their bank only*

2) Information Common to All Banks

There are also Instructor's Reports. You can use parts of the Instructor's Report as additional handouts for the participants. However, the participants should not see the other banks' decision information because it includes the officer time allocation, the only unknown variable in the game.

RERUNNING AN EARLIER CYCLE

You can rerun previous cycles of the game if necessary. There are three situations in which you may want to rerun a cycle.

- Many instructors have their students submit a second set of decisions for the first quarter, 2.2, after they have studied the first set of reports. They then enter the decisions and rerun 2.2.
- If you need to reprint the reports from an earlier quarter without changing any decisions, you must first rerun the quarter. As long as you do not change any decisions, the reports will be duplicates of the earlier reports.
- If you want to change a decision from an earlier period, you need to return to that period, change the decisions, rerun the cycle, and print the reports. The changes affect every quarter from the changed quarter to the current quarter, *whether you rerun the interim quarters or not*. To produce reports for the interim quarters, run a quarter and print its report; then run the next quarter and print its report, and so on.

To rerun a previous cycle

1) In the Stanford Bank Game main window, change the period. You can type in the new period or press the minus or plus sign on your keyboard (-) until the quarter you want appears.

2) If you want to change the decisions, enter the decisions as explained earlier. Remember that the changes affect every quarter from the changed quarter to the current quarter, *whether you rerun the interim quarters or not*.

3) Choose the Run A Cycle button. When the game is complete, the Reports window appears. Print the reports as explained earlier or choose the Close button to return to the main window.

MODEL SENSITIVITIES

SHARE PRICE COMPONENTS

Market price of individual bank stock is a function of—

1) K-factor: P/E adjustment multiplier

2) Current quarter's industry P/E ratio

3) Twenty percent of Weighted Adjusted non-operating earnings per share

4) Weighted and smoothed operating earnings per share net of reductions to shareholder value

5) Book value per share

6) The previous quarter's stock price (if you are in the competitive mode of the program)

## *MINIMUM MARKET PRICE OF STOCK (Based on Book Value):*

$$\frac{\text{Total Equity X .041}}{\text{Number of Shares Outstanding}} \quad \text{X} \quad \text{Industry P/E Ratio}$$
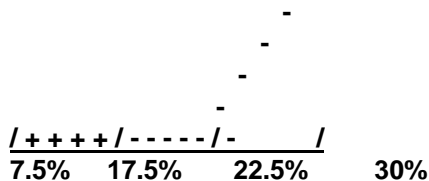
K-FACTOR

K-factor is a function of—

1) **Capital Adequacy**
   A capital adequacy ratio (total qualifying capital divided by total required capital) greater than 1.3 has no further positive effect. A ratio below 1.0 has a negative effect. The neutral point is 1.0.

   - - - - - - - - - / + + + + + + + + +/
   **1.0   1.3**
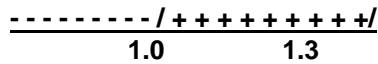
2) **Capital Notes**
   Leverage (capital notes divided by total equity) below 17.5% has a positive effect until it reaches 7.5%. Above 17.5% there is a negative effect which accelerates above 22.5% and reaches a regulatory maximum at 30%; 17.5% is the neutral point.

   ```
                          -
                         -
                        -
                       -
   / + + + + / - - - - - / -          /
   7.5%    17.5%     22.5%        30%
   ```
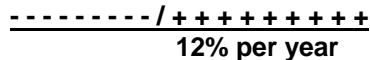
3) **Non-Accruing Loans**
   The neutral point for non-accruing loans (as a percentage of total loans) is 1.75%. Levels above that will hurt stock price until 6.25%.

   / + + + + + / - - - - -/
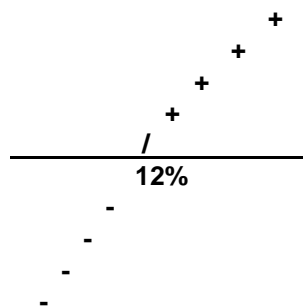   **0   1.75   6.25%**
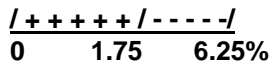
4) **Growth in Assets**
   A 3% quarterly growth rate in weighted total assets is a neutral position. This is a 12% annualized growth rate with no maximum or minimum limits.

   - - - - - - - - - / + + + + + + + + +
   12% per year

5) **Growth in Weighted Adjusted Operating Earnings Per Share**
   A 3% quarterly (12% annual) growth rate in WEPS has a neutral effect. However, this factor is weighted very heavily for determining the overall K-factor. That is, earnings growth greater than this is rewarded substantially and growth less than this is punished substantially.

```
                              +
                          +
                      +
                  +
              +
          /
         12%
       -
         -
           -
         -
```

6) **Liquidity Effect**
Liquidity is calculated as follows:

Cash - Required Reserves + Funds Sold + 90-day Gov.+Loans Maturing - CD's Maturing
                              Total Assets

A ratio greater than 25% has no additional effect; 15% is the neutral point. Below 15% there is a negative effect.

```
/ - - - - - - - - / + + + + + + + + /
0          15%         25%
```
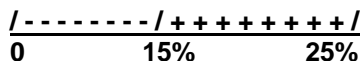
7) **Business Development Expenditures**
When the weighted average quarterly amount spent on advertising is .05% of total assets, it has a neutral effect. There are no benefits for having a ratio higher than .09%. Therefore, for a bank with $1 billion in assets the business development budget should be between $500,000 and $900,000 per quarter.

```
- - - - - - - - - / + + + + + + + + /
       .05%            .09%
```
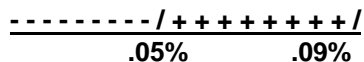
8) **Fed** *(LIBOR)* **Funds Borrowed**
The neutral point for the ratio, Fed *(LIBOR)* funds purchased divided by total assets, is 5%. Above that, there is a negative effect. Below that, to 2%, there is a positive effect. There is no additional positive effect below 2%.

```
/ + + + + + + + + / - - - - - - - -
2%         5%
```
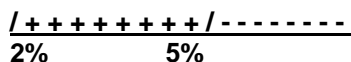
9) **Federal Reserve** *(Central)* **Bank Borrowing**
FRB *(Central Bank)* borrowing will have a substantial negative effect. This penalty reaches its maximum at 15% (borrowing divided by total assets) and remains at that level even if the ratio is increased.

```
/ - - - - - - - - - /
0          15%
```
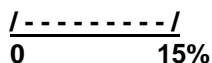
10) **Dividend Payout**

$$\frac{\text{Dividend Per Share}}{\text{25\% of previous 4 quarters' adjusted operating income}}$$

You are penalized for a payout ratio anywhere below 25% and greater than 99%. You are slightly rewarded for payouts between 25% and 35%. Once your ratio gets as low as 5%, there are no further negative effects.

no effect/ - - - - / + + + + /no effect/ - - -
      5%   25%   35%   99%

11) **Dividend Cut**
Once a team cuts its dividend, the model will remember it for the remainder of the game. Although the effects will diminish over time, stock price will suffer for at least 3 quarters. The extent of the penalty depends on the percentage cut in the dividend. There is no expressed reward for increasing the dividend.

FACTORS WHICH AFFECT CAPITAL NOTE ISSUES

1) **The previous quarter's capital adequacy ratio**
A ratio above 1.20 does nothing to lower the interest rate further. A ratio below 1.20 has a progressively negative effect on the interest rate (i.e., increases it).

- - - - - - - - - - - - / (no effect)
           1.2

2) **The previous quarter's debt ratio**
A debt ratio (debt/equity) greater than 21.2% has a progressively negative effect on the interest rate (i.e., increases it). A ratio below 21.2% has no effect.

(no effect)   / - - - - - - - - - - -
        21.2%

3) **Purchased funds available**
If relatively few purchased funds are available, the rate the bank has to pay on its new capital notes increases. If either Fed funds *(LIBOR funds)* or CD's available as a percentage of assets are less than 10% and 35% respectively, this increases the interest rate.

If the approximate rate for capital notes from the previous quarter is different from the actual, there are two reasons:

1) The capital adequacy effect is squared for the actual, but not for the approximate.

2) The approximate rate assumes that the bank will issue $5 million in new notes. If the bank issues more than this, the actual rate will increase, and if the bank issues less than $5 million, the actual rate will decrease (everything else being equal).

FACTORS WHICH AFFECT THE INTEREST RATES OF NEW CDs

1) **The Government Bond Rates**
   For instruments with similar maturities, each bank's CD rates will float approximately 25-75 basis points above these rates. Premiums above this are attributable to any combination of the following factors.

2) **The Capital Adequacy Ratio**
   The higher the capital adequacy ratio is above 1.0125, the less the bank pays for CD's. Likewise, the lower the capital adequacy ratio is below .9875, the more the bank pays for CD's. A capital adequacy ratio above 1.175 has no further effect on the interest rate for new CD's.

   - - -/   /+ + + + + + + +/ no further effect
     .9875 1.0125   1.175%

3) **ROE**
   The lower a bank's ROE in the previous quarter, the higher their CD rates. ROE's greater than 10% have no penalties. Below this, penalties get steeper as ROE's decrease to negatives.

   ROE - - - / - - - / - - - /
     0%   5%   10%

4) **Officer Time**

5) **Supply of Funds in the Economy**

FACTORS WHICH AFFECT TEMPORARY EMPLOYEES & OTHER EXPENSES

1) **Credit card processing costs.**

2) **Direct expenses associated with loan commitments** (.02% to .03% of total commitments).

3) **Total deposits and demand deposit processing costs.**

4) **Economic activity** which affects total loans and deposits available in the market.

5) **Salaries and benefits** (approximately 5%). Also, if salaries decrease by more than 5% in any given quarter, this increases expenses even more.

6) **Security sales** ($4,000 for each sale).

7) **Capital flags** for either notes or equity ($110,000 for each flag).

8) **Officer time devoted to new business**. Once this exceeds approximately 50%, the expenses increase exponentially.

9) **Salary policy and the previous quarter's ROE**. Basically, if the bank has good or even just respectable earnings, expenses will increase if salary policy doesn't properly compensate employees.

10) **Credit policy**. The more conservative the credit policy, the more expensive it is to the bank. The cost of this additional scrutiny is reflected here.

THE SALARY CALCULATION

The salary expense each quarter is based on the size and types of assets and liabilities in the bank. To calculate salary expense, the computer model first divides the accounts into categories.

Category I: Securities and Fed (*LIBOR*) Funds Purchased/sold;

Category II: Prime & Syndicated Loans, Commercial Demand Deposits, Due to Banks, CD's, and FRB *(Central Bank)* Borrowing;

Category III: High Loans, Public (*State*) Time Deposits, Public (*State*) Demand Deposits, and Money Market Time Deposits;

Category IV: Medium Loans, Real Estate, Consumer, and Credit Card Loans, and Regular Demand Deposits;

Category V: Net Premises

The computer program adds the ending balances of the accounts in each category and multiplies by a factor in order to obtain the quarterly salary expense.

Quarterly Salary = .00063 (I) + .00125 (II) + .002 (III) + .00313 (IV) + .0625 (V)

If participants complete calculation, the number will be slightly different from the figure in their report, because SBG is smoothing the changes that occur in the account balances over several quarters.

Appendix A
TERMINOLOGY

SBG VERSION XII, INTERNATIONAL & U.S. EDITIONS

The simulation program models are identical and the only differences are in the terms used in the reports and Players' Manuals. Equivalent terminology is as follows:

U.S. Edition	International Edition
1) Federal Funds	1) LIBOR Funds
2) (U.S.)Treasury Bills	2) 90 Day Government Securities
3) Trust Fees and Income	3) Pension Fees and Income
4) U.S. Government Notes	4) (Other) Government Securities
5) Federal Reserve Bank	5) Central Bank
6) Public Demand Deposits	6) State Demand Deposits
7) Trust Department Deposit Accounts	7) Pension Department Deposit Accounts
8) Municipal Bonds	8) State Bonds
9) U.S. Treasury Tax and Loan Accounts	9) Government Tax and Loan Accounts
10) Public Time Deposits	10) State Time Deposits
11) Municipal Securities	11) State Securities
12) Rediscount Rate	12) Central Bank Rate

STOCK PRICING FACTORS and
FINANCIAL STATEMENT ANALYSIS

STOCK PRICING FACTORS

In SBGs idealized market, a bank's stock price represents what investors are willing to pay for each share of common stock. The primary determinants of the stock price are the bank's Adjusted Operating EPS (exponentially smoothed), the average P/E ratio of all banks in the economy, and the K factor. The K factor may be less than or greater than 1.0, meaning that an individual bank's stock is selling for a discount or a premium relative to the average P/E ratio.

SBG includes a simplified hedging feature. In order to keep the hedging feature simple, we had to bend a few accounting rules. For the purpose of calculating stock price, we calculate the difference between non-operating earnings and the after tax adjustment to retained earnings.

If the number is negative, operating earnings are reduced by this amount. All calculations in the Stanford Game that would normally use "earnings" (for example, ROE) use this adjusted operating earnings figure. If the number is positive, 20% of the average value over the last two quarters is used as a positive addition to stock price. Basically, the model rewards sustainable increases to shareholder value and penalizes decreases. Changes in equity also have a direct effect on the capital ratio, which is an important variable in the cost of funds for each bank.

The stock price of a particular bank is determined by taking the product of its exponentially smoothed earnings (which include the adjustments noted above), the economy average P/E ratio, and the bank's K factor. Stock price is weighted over several quarters of time and previous stock prices affect the current price. Some of the measures in the stock price equation are in no way intended to be an exact replication of real market behavior. Rather, they are to some extent replacements for regulatory constraints. For detailed information on stock price and the K factor, see "Model Sensitivities."

FINANCIAL STATEMENT ANALYSIS

Ratio	Formula
Performance Ratios	
Return on Equity (ROE)	(Net income x 4) ÷ Total equity
Return on Assets (ROA)	(Net income x 4) ÷ Total resources
Equity Multiplier (EM)	Total resources ÷ total equity
Profit Margin (PM)	Net income ÷ gross operating income
Asset Utilization (AU)	Gross operating income x 4 ÷ total resources
Net Interest Margin (NIM)	(Total interest income - Total interest paid) ÷ (Federal funds sold + Total securities + Gross loans and mortgages - Provision for loan losses from the Balance Sheet)
Earnings Base (EB)	(Federal funds sold + Total securities + Gross loans and mortgages - Provision for loan losses) ÷ Total resources
Spread	[Total interest income ÷ (Federal funds sold + Total securities + Net loans and mortgages)] - [Total interest paid ÷ (Time deposits + Federal funds purchased + Funds borrowed from FRB)]
Burden/Total assets	[(Service charge income + Fees and other income) - (Salaries and benefits + Occupancy expense + Business development + Other expenses x 4)] ÷ Total resources
Noninterest income/Overhead Expense	(Service charge income + Fees and other income) ÷ (Salaries and benefits + Occupancy expense + Business development + Other expense)
Expense Control: PM Components	
Interest expense/Total revenue	Total interest paid ÷ Gross operating income
Average interest cost of liabilities:	
Public funds	(Public interest expense x 4) ÷ Public time deposit accounts
Certificates of deposit	(CD's interest expense x 4) ÷ CD's time deposit accounts
Savings deposits	(Savings interest expense x 4) ÷ Public time deposit accounts
Federal funds purchased	(Fed fund purchases interest expense x 4) ÷ Federal funds purchased
FRB borrowing	(FRB borrowing interest expense x 4) ÷ Funds borrowed from the FRB

Capital notes	(Capital notes interest x 4) ÷ Capital notes
Liabilities (Percent of Total Assets)	
Demand deposit accounts:	Demand deposits ÷ total resources
Commercial	(Commercial demand deposits + Due-to-banks Demand deposits) ÷ Total resources
Consumer	Regular checking demand deposits ÷ Total resources
Public funds	Public demand deposits ÷ Total resources
Time deposit accounts:	Time deposits ÷ Total resources {BS}
Money market savings	Money market savings ÷ Total resources
Certificates of deposit	Certificates of deposit (private) ÷ Total resources
Public funds	Public time deposit accounts ÷ Total resources
Federal funds purchased	Federal funds purchased ÷ Total resources
FRB borrowing	Funds borrowed from FRB ÷ Total resources
Capital notes	Capital notes ÷ Total resources
Other borrowed funds	Other liabilities ÷ Total resources
Interest-bearing liabilities	(Time deposits + Federal funds purchased + Funds borrowed from FRB) ÷ Total resources
Stockholders' equity	Total equity ÷ Total resources
Overhead Expenses (Percent of Total Revenue)	
Personnel expense	Salaries and benefits ÷ Gross operating income
Occupancy expense	Occupancy expense ÷ Gross operating income
Business development expense	Business development expense ÷ Gross operating income
Other operating expenses	Other expenses ÷ Gross operating income
Total operating expenses	(Salaries and benefits + Occupancy expense + Business development expense + Other expenses) ÷ Gross operating income
Current Loan Loss Provision/Total Revenue	Addition to the loan loss provision for: (Syndicated loans + Prime loans + High loans + Medium loans + Real estate loans + Consumer loans + Credit card loans) ÷ Gross operating income
Income Taxes/Total Revenue	Applicable taxes ÷ Gross operating income
Extraordinary Gains/Total Revenue	Gains on securities and loans (after tax) ÷ Gross operating income

Gross Income: AU Components	
Interest income/Total assets	(Total interest income x 4) ÷ Total resources
Gross yields on assets:	
Syndicated loans	(Syndicated loan interest x 4) ÷ Beginning syndicated loan balance
Prime commercial loans	(Prime loan interest x 4) ÷ Beginning prime loan balance
High grade commercial loans	(High loan interest x 4) ÷ Beginning high loan balance
Medium grade commercial loans	(Medium loan interest x 4) ÷ Beginning medium loan balance
Real estate loans	(Real estate loan interest x 4) ÷ Beginning real estate loan balance
Consumer loans	(Consumer loan interest x 4) ÷ Beginning consumer loan balance
Credit card receivables	(Credit card loan interest x 4) ÷ Beginning credit card loan balance
Federal funds sold	(Fed funds sales interest x 4) ÷ Federal funds sold
Treasury bills	(Treasury bills interest x 4) ÷ Treasury bills
U.S. Government notes	(U.S. Government notes interest x 4) ÷ U.S. Government notes
State and municipal securities	(State and municipal bonds interest x 4) ÷ State and municipal securities
Assets (Percent of Total Assets)	
Gross loans and mortgages:	Gross loans and mortgages ÷ Total resources
Syndicated loans	Ending syndicated loan balance ÷ Total resources
Prime commercial loans	Ending prime loan balance ÷ Total resources
High grade commercial loans	Ending high loan balance ÷ Total resources
Medium grade commercial loans	Ending medium loan balance ÷ Total resources
Real estate loans	Ending real estate loan balance ÷ Total resources
Consumer loans	Ending consumer loan balance ÷ Total resources
Credit card receivables	Ending credit card loan balance ÷ Total resources
Loan loss reserve	Provision for loan losses ÷ Total resources
Total investment securities:	Total securities ÷ Total resources
Treasury bills	Treasury bills ÷ Total resources
U.S. Government notes	U.S. Government notes ÷ Total resources
State and municipal securities	State and municipal securities ÷ Total resources

Cash and due from banks	Cash and due from banks ÷ Total resources
Bank premises	Bank premises (net of depreciation) ÷ Total resources
Other assets	Other assets ÷ Total resources
Noninterest Income (Percent of Total Assets)	
Total noninterest income:	[(Service charge income + Fees and other income) x 4] ÷ Total resources
Service charge income	(Service charge income x 4) ÷ Total resources
Trust income	(Trust fees x 4) ÷ Total resources
Real estate income	[(Real estate servicing income + Real estate loan initiation fees) x 4] ÷ Total Resources
Credit card income	(Credit card fees x 4) ÷ Total resources {BS & #18}
Commercial loan fee income	[(Financial services fees + Letter of credit fees + Loan commitment fees) x 4] ÷ Total resources
Other fee income	(Other fee income x 4) ÷ Total resources
Credit Risk Ratios	
Net loan charge-offs/Gross loans and mortgages	[(Charge-offs for: Syndicated Loans + Prime loans + High loans + Medium loans + Real estate loans + Consumer loans + Credit cards) x 4] ÷ Gross loans and mortgages
Loan loss reserves/Gross loans and mortgages	Provision for loan losses ÷ Gross loans and mortgages
Loan loss reserves/Nonaccrual loans	Provision for loan losses ÷ (Nonaccruing loans in: Prime loans + High loans + Medium loans + Real estate loans +Consumer loans + Credit cards) }
Current provision for loan losses/Gross loans and mortgages	[(Addition to the loan loss provision for: Syndicated loans + Prime loans + High loans + Medium loans + Real estate loans + Consumer loans + Credit cards) x 4] ÷ Gross loans and mortgages
Loans refused/Gross loans and mortgages	[(Loans refused in: Prime loans + High loans + Medium loans + Real estate loans + Consumer loans + Credit cards) x 4] ÷ Gross loans and mortgages
Annualized growth in gross loans and mortgages	Quarterly percentage change in gross loans and mortgages x 4
Annualized growth in provision for loan losses	Quarterly percentage change in provision for loan losses x 4
Liquidity Risk Ratios	
Total equity/Total assets	Total equity ÷ Total resources

Core deposits/Total assets	[(Total demand deposits x 0.6) + Money market savings + Public time deposit accounts] ÷ Total resources
Volatile liabilities/Total assets	10% of Demand Deposits + CD's maturing in 90 days + F. Funds Purchased + FRB Borrowing ÷ Total resources
Liquid Assets/Total Assets	Cash and Due From + F. Funds sold + Govt. Securities ÷ Total Assets
Net Volatile Assets/Total Assets	Total Securities – total pledge (if positive number) + Due from Banks + FF sold ÷ Total resources
Securities maturing within one year/Total assets	[U.S. Government securities maturing in: (1 to 90 days + 91 to 180 days + 181 to 270 days + 271 to 365 days) + State and muni securities maturing in: (1 to 90 days + 91 to 180 days + 181 to 270 days + 271 to 365 days)] ÷ Total resources
Net loans and mortgages/Total assets	(Gross loans and mortgages - Provision for loan losses) ÷ Total resources
Net loans and mortgages/Total deposits	(Gross loans and mortgages - Provision for loan losses) ÷ Total deposits
Interest Rate Risk	
Repriceable assets/Total assets:	
Within three months	Total rate sensitive assets maturing in 1 to 90 days ÷ Total resources
Within one year	[Total rate sensitive assets maturing in: (1 to 90 days + 91 to 180 days + 181 to 270 days + 271 to 365 days)] ÷ Total resources
Repriceable liabilities/Total assets:	
Within three months	Total rate sensitive liabilities maturing in 1 to 90 days ÷ Total resources
Within one year	[Total rate sensitive liabilities maturing in: (1 to 90 days + 91 to 180 days + 181 to 270 days + 271 to 365 days)] ÷ Total resources
Repriceable gap/Total assets:	
Within three months	Balance sheet gap in 1 to 90 days ÷ Total resources
Within one year	[Balance sheet gap in: (1 to 90 days + 91 to 180 days + 181 to 270 days + 271 to 365 days)] ÷ Total resources
Capital Risk	
Total equity/Total assets	Total equity ÷ Total resources
Total qualifying capital/Total assets	Total qualifying capital ÷ Total resources
Capital notes/Total assets	Capital notes ÷ Total resources

Cash dividends/Net income	Dividend declared ÷ Net income
Annualized growth in total equity	Quarterly percentage change in total equity x 4
Annualized growth in total qualifying capital	Quarterly percentage change in total qualifying capital x 4
Operational Risk	
Personnel expense/Total assets	(Salaries and benefits x 4) ÷ Total resources
Occupancy expense/Total assets	(Occupancy expense x 4) ÷ Total resources
Business development expense/Total assets	(Business development expense x 4) ÷ Total resources }
Total assets/Number of branches	Total resources ÷ Current number of branches
Total deposits/Number of branches	Total deposits ÷ Current number of branches
Total loans/Number of branches	(Gross loans and mortgages - provision for loan losses) ÷ Number of branches

DEFINITIONS FOR DERIVED VARIABLES

Ratio	Formula
1. Net interest income	Total interest income - Total interest paid
2. Earning assets	Federal funds sold + Total securities + Gross loans and mortgages - Provision for loan losses
3. Net interest margin	Net interest income ÷ Earning assets
4. Earnings base	Earning assets ÷ Total assets
5. Interest-bearing liabilities	Time deposits + Federal funds purchased + Funds borrowed from FRB
6. Spread	(Total interest income ÷ Earning assets) - (Total interest paid ÷ Interest bearing liabilities)
7. Burden	Noninterest income - Noninterest expense
8. Noninterest income	Service charge income + Fees and other income
9. Noninterest expense (overhead)	Salaries and benefits + Occupancy expense + Business development expense + Other expenses
10. Core deposits	(Demand deposits x 0.6) + Money market savings + Public time deposits
11. Volatile liabilities	(Demand deposits x 0.4) + CD's (private)
12. Total qualifying capital	[Total equity + Capital notes + (Loan loss reserves x 0.5)]
Net loans and mortgages	Gross loans and mortgages - Provision for loan losses

MAXIMUM AND MINIMUM RATES

The annual interest rates on the decision forms are compared to the annual rates in the economic information. In any given quarter:

ASSET OR LIABILITY	MAXIMUM RATE ABOVE MARKET	MINIMUM RATE BELOW MARKET
	IN BASIS POINTS	
Prime Loans	20	150
High Loans	30	150
Medium Loans	40	150
Real Estate Loans	300	250
Consumer Loans	300	250
Money Market Savings	150	150