

PARTICIPANT INTERACTIONS

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I. INTRODUCTION

One of the most popular areas where simulation games are used as teaching/learning tools is the management of financial institutions. Practically every major business school has its own bank management simulation game. However, most of these games provide the participants with direct interaction with the computer only. Interactions with other participants are either indirect, through the computer, or non-existent. This lack of direct participant interactions would not be a shortcoming if the actual experience of managing financial institutions does not involve participant interactions. However, the management of financial institutions does include a substantial amount of secondary market transactions involving direct interactions with other financial institution managers.

We have constructed a financial institution management game in an attempt to correct the situation. The game simulates management problems of the assets and liabilities of four different financial institutions: commercial banks, savings and loan associations, life insurance companies and pension funds. The game allows the more traditional interaction with the “market”, as simulated by the computer, and also allows direct interaction among participants. This interaction is achieved through secondary markets that are limited to the participants in the game. Negotiations in the secondary markets enable the human factor to play a significant role in the game. More importantly, it has, in our opinion, encouraged and resulted in innovations within the framework of the game by the students.

Section II describes the mechanics of the game and points out the stage at which interactions among participants are greatest. Section III summarizes our experience with the game and specifically discusses two major innovations by the students.

II. HOW THE GAME IS PLAYED

Each participant or participating group is assigned to manage a particular financial institution. Financial institutions are assigned in such a way that there are at least two groups managing each type of financial institution. This facilitates evaluation of performance since,

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otherwise, the management performance of different financial institutions will have to be compared.

Each team starts out with an assigned balance sheet. Its management problems are to revise the asset and liability com-positions to maximize profit. The assets and liabilities that the financial institutions may have are transacted in three separate markets: the primary market, the secondary market and the financial institution primary market (FIPM, hereafter).

The primary market

The assets and liabilities transacted in the primary market are: U.S. government securities, municipal bonds, commercial loans, consumer loans, mortgages, corporate bonds, corporate stocks, savings accounts and certificates of deposit.

These assets and liabilities are further classified into “market” and “competitive bidding” assets and liabilities. (Although the discussion below will be on assets, the increase and decrease of liabilities also follow the same rules.) Market assets are mostly purchased and sold by market orders. Competitive bidding assets are purchased and sold by bids or negotiations.

A market order means that management is willing to pay or accept whatever rates or prices the market will bear. The market order must always be accompanied by the exact amount of purchase desired, since the market is assumed to be infinitely elastic at the market rate. The uncertain part of a market asset transaction is, therefore, the interest rate on the asset.

A bid allows management to set the price at which an asset will be transacted. Again, a bid may be accompanied by a quantity limit. However, here, the limit will not set the exact quantity of asset. Instead, it sets the maximum (but not the minimum) since the price set by the order may be below the market rate. For example, a savings and loan association may offer to buy mortgages at 9%. For liquidity reasons, it may set \$20 million as the total amount of mortgages it can accept. If 9% is higher than the other financial institutions are charging, and the market supply of mortgages is low, then the particular savings and loan association will probably not get \$20 million but something else. In effect, the teams compete for the amount of assets available through the bid. A team may then increase the size of their earning assets with increased costs and at the expense of other teams.

The secondary market

Treasury bills, corporate bonds and corporate stocks are assumed to have efficient secondary markets. Therefore, there is no attempt to differentiate new and old instruments. These securities may be transacted in unlimited amount. When market assets are held for more than

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one quarter and then sold, any gain or loss is considered capital gain or loss for tax purposes. On the other hand, commercial loans and consumer loans are assumed to have no secondary market.

Mortgages and municipal bonds are assumed to have limited secondary markets. The secondary market is limited only to the participants in the game. Therefore, a team cannot sell any old mortgages or municipal bonds unless another team in the game decides to buy some old mortgages or old municipal bonds. The prices will have to be negotiated by the transacting parties and set at a level acceptable to both parties.

The financial institution primary market

This market is so-named to differentiate it from the house-hold and industry primary markets. Through this market, limited special assets may be created in the form of inter-and intra- financial institution sector loans. All transactions in this market are on a negotiated basis. Subject to regulations, the following may be created.

1. Federal funds (FF) - This is an inter-bank loan. It is so-called in the banking industry because the assets traded are Federal Reserve Bank deposits which are used as reserves. Although few savings and loan associations actually participate in the FF market, all savings and loan associations are allowed to sell FF to the extent that they have excess cash.

2. Repurchase agreements - Other financial institutions may borrow from banks. The limits of such borrowings are set by government regulatory agencies. The loans have to be secured with marketable securities.

In addition, banks are allowed to borrow once from the Federal Reserve Bank discount window. On the other hand, savings and loans have flexibility in both maturity and frequency of borrowing up to 50% of total deposits from the Federal Home Loan Bank.

The game is played by the quarter. Each quarter is divided into four stages.

First stage

Participants are given a sheet entitled "Market Rates - Current and Projections", a "decision sheet" and blank work sheets. The "Market Rates - Current and Projections" sheet lists assets and liabilities and their actual and forecasted interest rates. A "current" column lists the rates which are available on the opening day of the game. The "First quarter projection" column gives a forecast of the average interest which will actually apply to items acquired during the quarter. This second column is much more relevant to management decision than the first one.

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The “Fourth quarter projection column is the prediction of interest rates in the fourth quarter. The “Projected average availability” column gives projections about the supply of financial assets to the firm at the projected first quarter rates.

Second stage

Each firm takes the information supplied and makes decisions regarding the asset and liability compositions desired. Competitive bidding assets are obtained in accordance with instructions describing each of the individual assets and liabilities. Amounts of these securities received will be determined by the relationship of a team’s offered interest rate to the offered rates of the other teams.

Market securities do not require bidding. A team will receive the exact amount of market assets specified, but these assets will yield the actual interest rates for the quarter -which normally vary somewhat from the projected rates. The actual rates are given at the third stage.

In the case of the competitive bidding assets, the interest rate a team offers will be the precise rate which will apply to any of these assets acquired. The uncertainty comes in two forms. Since the team will not have the actual interest rates for the quarter until the third stage, it may be bidding above or below the market rate simply due to faulty predictions. Also, the team will only be able to guess at the amounts of securities the interest rates bid will yield until the end of the quarter.

Management can also elect to sell eligible securities. If so, this is indicated on the decision sheet. Obviously, the time such securities have been held will affect their tax status.

The procedure for acquiring liabilities are the same as those for assets. All the decisions are entered into the decision sheet.

Third stage

After the portfolio decisions have been submitted, actual interest rates for the quarter and the actual amounts of competitive bidding securities acquired are given to the management concerned. Management then calculates results for the quarter and submits the information via the financial forms provided. If one has too much assets, the team may either increase liabilities to equal assets or decrease the assets to equal liabilities. Liabilities may be increased through the limited borrowings allowed or through secondary market or FIPM transactions. Borrowings are most flexible for savings and loan’s through Federal Home Loan Bank Advances, then for banks through Federal Re-serve Bank Discounts once only in the entire game and nonexistent for life insurance companies and pension funds. Therefore, life insurance companies and pension funds

will always have to go to the secondary market and FIPM to increase liabilities. De-crease of assets may be carried out by sale in the secondary market of old eligible securities only. On the other hand, if a team has too much liabilities, then it may either de-crease liabilities or increase assets. Liabilities may be decreased through the repayment of borrowings. Increase of assets is achieved only through the secondary market or the FPM. The inflexibilities force the participants to engage in negotiations with other teams. It is at this stage that the teams seek out each other for secondary market and FIPM transactions. The borrowings and/or secondary market and FIPM transactions are then reported.

Fourth stage

The institutions then prepare their income and loss and position statements. In this case, operating expenses are set at a fixed percentage of total assets assuming no economies of scale. The statements are then audited. Penalties are imposed for inaccuracy or infraction of the regulations, e.g., capital requirement.

III. EXPERIENCE WITH THE GAME

The game has been enthusiastically received by the students. They especially enjoyed the opportunity to approximate a market experience and observe the prices for the financial securities traded in the secondary market and the FIPM reach equilibrium through repeated negotiations with other teams. Since the teams were rotated from one type of financial institution to another, the game made them appreciate the value of theory vis-a-vis experience and vice-versa. Theory enabled them to avoid disaster when making the first decision upon being assigned to a new type of financial institution. Experience enabled them to improve on past decisions.

The usual problems with team projects were encountered. Since time required was flexible, some groups were fairly nonchalant while other groups spent considerable time on each decision. Scheduling obstacles and interpersonal problems necessitated reassignment of team members occasionally. The biggest team project problem remained that of students who “free-loaded” and did not contribute as much effort and time as their team members. To solve this problem, every individual player was given an opportunity to evaluate each member of his team, on a confidential basis. This was generally approved by students.

Innovations, major and minor, by students were many and varied every time the game was played. These were unexpected when the game was constructed. They seem to have been triggered by the very loosely organized secondary market as set forth in the game. In fact, the students were simply told to trade without any further instructions. Arbitrage transactions

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occurred frequently. The two most notable innovations were the creation of a “Eurodollar” market and the establishment of organized secondary market and FIPM.

Creation of a “Eurodollar” market

This is not a market patterned after the real Eurodollar market. Rather, it came about through the efforts of teams to arbitrage between different class sections.

At one time, the game was played simultaneously in two class sections. The participants in each section quickly realized that when the sources of funds for one financial sector “dried up”, the sources of funds for the other sectors in the same class section followed very rapidly. However, because the two sections were playing with different sets of economic conditions, the incidence of excess supply of and demand for funds were less than perfectly correlated. One especially enterprising team negotiated secondary market and FIPM transactions across class sections without first seeking the approval of the regulatory agency (the professor). When the transactions were announced and approved, the team was able to realize abnormal profits.

Since the students were not informed of this possibility, this market did not exist every time the game was played.

The establishment of organized secondary market and FIPM

When told to trade secondary market and FIPM securities, the teams typically started out with direct placement transactions. After some time, the teams usually came to realize the benefits of an organized exchange. The evolution of the organized exchange tended to follow a pattern of first, the formation of a number of small groups of teams meeting at set time at different places. Then these groups were consolidated into one large exchange. Since the professor refrained from participating in the process, the organized exchange evolved through word of mouth from one team to another. At one time, the exchange was so formal that the teams actually set their own trading rules and time limits.

Again, since the students were not informed of the possibility, the organized exchange did not exist every time the game was played. It was interesting to note that arbitrage profit was a casualty of the organized exchange since the exchange resulted in the homogeneity of information.

In conclusion, we observe that the game was designed to be a pedagogical tool to provide the student with some classroom experience related to asset and liability management decisions of the various financial institutions, in the context of interactions in the money market. We did not strive for detailed reality but, rather, maintained only what we considered the most important

aspects of the problem. The simplification process resulted in flexibilities and inflexibilities in areas where they do not exist in reality. Flexibilities provided opportunities for testing how unorthodox strategies would perform. The introduced inflexibilities may have made the game more risky than the actual market. However, we have found the game to offer students the opportunity to innovate in ways that we have not encountered before, whether in the other games that we have constructed or cases used to illustrate problem situations. This, we ascribe to the fact that students were not solely interacting with a computer program which by necessity could not have the flexibilities of direct participant interactions.