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## **Financial Appraisal of the Bank for Cooperatives**

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Cooperatives differ in a very basic way from non-cooperative investor-owned firms. The cooperative operates for the benefit of its member patrons while other firms operate for the benefit of their owners/shareholders. As a result the operation or management decisions of a cooperative may be different from that of a non-cooperative. The intent of a marketing cooperative is to increase the price that is received by its members, while an input supply cooperative aspires to reduce input prices paid by its members. This can potentially affect the riskiness of the cooperative. An example of this manifested during the farm crisis of the 1980s. The Farm Credit System (FCS) encountered significant financial stress as increasing market interest rates for funds combined with poor loan performance. In addition, increased variability in interest rates paid by the Farm Credit System along with the need to maintain reduced rates to members threatened the economic viability of the cooperative.

This paper evaluates whether being a patron owned cooperative influences the riskiness or vulnerability of an input supply cooperatives. The relative financial situation of cooperative agricultural lenders, specifically the Bank for Cooperatives (BC) including the Central Bank for Cooperatives, are compared with similar performance or operating results of a commercial bank, Chase Manhattan, and the average for commercial banks from 1970 to 1987. Comparison of selected financial measures and trends provides insights into how operating decisions based on the different operating objectives may influence the risk and risk levels of the BCs. This is important in a risk return sense since the level of risk of the lending cooperative will influence the risk of its members. As the cost of debt for the cooperative becomes riskier this in turn increases the cost of capital for the firm.

### **Cooperatives**

A cooperative is a special type of firm which has ownership and control in the hands of the individuals that utilize the services or products of the firm. One of the first theoretical works on modeling cooperative behavior by Enke hypothesized the objective of cooperatives is to maximize net consumers' surplus. More recent work by Van Sickle and Ladd suggests that the cooperative's objective is to maximize the total after-tax profits of the member patrons. This is in contrast to assuming maximization of net worth or shareholder wealth of an investor-owned firm. Theoretically different optimizing behavior of cooperatives and non-cooperatives would suggest different levels of financial performance along with different levels of risk.

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In spite of these basic differences in objectives there are various empirical studies of the financial performance of cooperatives by comparing them directly with investor-owned firms. Schrader et al. observed that the financial performance of small cooperative firms during 1978 - 79 was better than that of small proprietary firms in terms of profitability and return on total assets, however the performance of large cooperatives was inferior to that of large proprietary firms. Parliament et al. found that over the period of 1976-87, the performance of regional dairy cooperatives was significantly better than that of commercial dairies in terms of leverage, liquidity, coverage, and efficiency ratios and not significantly different in terms of profitability, i.e., return on equity.

### **Cooperative Lending**

Little empirical work has focused on the lending institutions that service cooperatives. A primary source of credit for agricultural and agribusiness cooperatives is the Bank for Cooperatives (and the Central Bank). In 1976, the Bank for Cooperatives provided 62.2 percent of farmer cooperatives' total outstanding borrowed funds (Griffin et.al).

The Bank for Cooperatives is one of the three farm credit institutions in the Farm Credit System (FCS). FCS procures funds from the money markets and provides credit to farmers, ranchers and their cooperatives. Until December, 1988, the FCS was comprised of 12 Farm Credit Districts which served the fifty states and Puerto Rico. Each Farm Credit District had a Federal Land Bank, a Federal Intermediate Credit Bank and a Bank for Cooperatives. In addition, a Central Bank for Cooperatives in Denver, Colorado assisted in lending to large cooperatives. However, since January, 1989, there have been major changes in the FCS. Ten of the twelve Bank for Cooperatives and the Central Bank for Cooperatives have merged into a National Bank for Cooperatives and renamed CoBank<sup>1</sup>.

The Farm Credit System is different from commercial banks in terms of acquiring funds. The FCS procures funds directly from money markets as bonds, whereas commercial banks procure funds by issuing bonds, accepting deposits, and raising capital. Other aspects of the Bank for Cooperatives may cause it to be different from investor owned banks. These characteristics involve the special relationship between the Farm Credit System and the federal government. Historically, the BCs were organized under the Farm Credit Act of 1933. In 1955 the startup capital initially provided by the Federal Government was replaced such that the bank is now private, but still supervised by the government. Stigum states that federal agency bonds carry a "de jure or de facto" backing by the Federal Government. Thus, although the federal government is theoretically not liable for the debentures issued by the BCs, investors perceive that such backing exists and reduce the interest rate demanded by the market.

Evidence of the implicit backing is both anecdotal and empirical. On the anecdotal, during the 1980s the Farm Credit System accumulated significant bad debt losses. Once the magnitude of the stress become apparent, the Farm Credit Act of 1987 was passed to strengthen the system. Recently, an event study of this episode found no evidence that investor perceptions changed

when this bill was signed into law (Singer). Thus, the market may have anticipated government action from the beginning. On a similar view, Moss and Shonkwiler find no evidence that the spread between Farm Credit System bonds and Treasury security of equal maturities change with changes in risk in agriculture.

However, the perceived linkage between the Farm Credit System and the federal government may also hinder the Bank for Cooperatives. Specifically, its size and scope of lending may single the system out for right to farm or borrower right legislation. A recent example of this effect may have been the moratoria on farm foreclosures during the farm financial crisis of the 1980s.

### **Lending in the 1980s**

Agriculture lending institutions in the U.S. suffered an extended period of financial stress during the 1980s. As the loan charge-offs in agriculture began to climb in the 1980s, the proportion of agricultural banks reporting negative earnings started to rise, going up to 13 percent in 1984 and 18 percent in 1985 (Melichar). Agricultural bank failures, though generally small in size, accounted for more than half of all failures of commercial banks during the spring and summer of 1984. Melichar observed that although agricultural banks accounted for approximately three-fifths of bank failures in 1986, their assets were less than two-fifths of the assets at all failed banks.

Agricultural intermediaries were not the only financial institutions experiencing financial difficulties in the 1980s. Persistent weakness in business activity and employment, along with high interest rates, resulted in financial strains on commercial non-agricultural banks. In the early 1980s, there were domestic and worldwide economic weaknesses and wide fluctuations in interest rates levels. This placed some sectors of the economy (such as housing and automotive) under heavy financial pressure. Concurrent with the decline in the general economy, Penn Square Bank, a major performer in the energy lending field in the Southwest, became insolvent. Continental Illinois National Bank experienced a serious liquidity crisis (staff report, 1985). Furthermore, poor asset quality risk was responsible for the failure of many banks in 1984, while a high degree of interest-rate risk resulted in the failure of many savings and loans institutions during 1981-1984 (staff report, 1985).

### **Bank Management Analysis**

The management of a financial institution is generally broken down into asset management, liability management, and management of equity capital funds (Reed). Financial analysis evaluates the liquidity, profitability and net worth of a lending institution to assess aspects of management in an external environment.

## Definitions

The liquidity of a bank is typically measured by the ratio of loans to source of funds<sup>2</sup> (bonds or deposits). When this ratio reaches a relatively high level, banks are less liquid and become less willing and possibly unable to lend. Because of the fundamental differences in how funds are raised between commercial banks (deposits) and the Bank for Cooperatives (bonds), the liquidity of BCs is measured by the ratio of loans to bonds, where bonds are defined as the total amount of net consolidation and system-wide bonds outstanding and notes payable. Liquidity for the commercial bank is measured by the ratio of loans to deposits, with deposits defined as the total amount of non interest bearing and interest bearing deposits.

Profitability is an important measure of the performance of a financial institution and is the ultimate measure of the health and viability of the operation. Profit is generally measured by net income or net profit after taxes. Profitability is a relative assessment and is measured as a ratio of profit relative to total assets or relative to capital or equity. For purposes of this study the return on asset (ROA) is used to measure the profitability of the firms, where asset values are measured as the average between beginning and ending of the year total assets.

The capital funds, or total equity of a bank reflects the amount of assets owned by the bank owners. The management of these funds are crucial to the performance of any bank. The function of equity capital includes protection against unexpected losses, ensuring solvency, funds for bank expansion, and as a source of funds for the purchase of real assets.

The capital to total ending assets ratio used in the study evaluates the adequacy of the equity capital relative to the overall size of the firm. The higher this capital ratio, the more the bank relies on equity capital to finance the bank assets. A low ratio indicates a highly leveraged bank, with an extremely low ratio indicating a high potential for business failure.

## Results

As shown in figure 1 for the period from 1977 to 1987, the average commercial banks was sufficiently more liquid than the Bank for Cooperatives. As shown in Table 1<sup>3</sup>, the annual average ratio was .713 for commercial banks, .989 for BCs and .836 for Chase. The higher liquidity of the commercial banks is due to the reserve requirement that must be legally maintained by the commercial banks. The lack of liquidity for BCs is consistent with their not needing to meet the day to day liquid cash needs that occurs in commercial banking. However, during the latter years the BCs also experienced a meaningful increase in liquidity with levels approaching those of Chase Manhattan. This period coincides with the period when agricultural lending in general and FCS in particular were experiencing their most severe times of financial stress.

Figure 2 compares the profitability of the financial institutions. Profitability is measured as the return on average total assets. For the first eight years of the period the profitability of the BCs

was above that of commercial banks and Chase. In 1985 and 1986 the return on assets for the BCs was at or below that of commercial banks. The annual average return to assets over the period was 1.069%, .332% and .698% for the BCs, Chase, and commercial banks respectively (Table 2).

A capital ratio evaluates the adequacy of the equity capital relative to assets. As shown in figure 3 the equity position of the BCs generally exceeds that of commercial banks in all but one year and was above that of Chase in every year. For commercial banks the capital to asset ratio was fairly consistent and averaged 6.257% for the period, which was higher than that of Chase Manhattan (Table 3). The BCs had an average of over 10%. The higher capital ratio for the BCs again reflects differences in operation where a major portion of their capital comes from member stock ownership requirement. Consistent with normal cooperative procedures borrowing cooperatives are required as part of their loan agreement to purchase stock in the BCs.

The test statistics for determining whether the measures for BCs, commercial banks and Chase are significantly different are presented in the tables. The test statistic results for the BCs for all three variables; liquidity, return on assets, and the capital ratio are all significantly different from those measured for Chase Manhattan and the average of commercial banks at the 5% level. The averages for Chase Manhattan are also different from those of the average commercial bank.

### **Risk Analysis**

Two of the primary sources of risk for a lending institution are credit risk and interest rate risk. Credit risk is the uncertainty associated with the lending institution's loan portfolio. For a cooperative lender this is the risk associated with the repayment of debt by its member patrons. The lending practices and credit analysis will determine the degree of credit risk incurred by the lending institution.

#### **Interest Rate Risk**

Interest rate risk is the uncertainty associated with changes in interest income and interest expenses that result from changes in interest rates. This is analogous to the price risk (both output and input prices) of the firm. Similarly, the source of this risk for lending institutions is the supply and demand conditions in the domestic and international monetary markets.

A financial institutions net interest margin is the difference between the interest rate received by the bank from its interest earning assets and the interest rate paid by the bank on its interest earning liabilities. As pointed out by Ellinger and Barry changes or variability in the interest margin is then a function of the interest-rate-sensitive assets and the interest-rate-sensitive liabilities. So as the net interest margin decreases the bank is either realizing falling interest income, increasing interest costs, or both.

## Results

Financial risk conditions of BCs are compared with those of Chase Manhattan Bank, and average commercial banks for the period 1977 through 1987. This period includes banking deregulation but is just prior to FCS reorganization. Annual data from the balance sheets and income statements for BCs and Chase Manhattan Bank are used, while the average for commercial banks is calculated from U.S. Federal Deposit Insurance Corporation reports.

The interest rate risk problems outlined in the previous section on risk are graphically displayed in figures 4, 5, and 6. In figure 4 the annual interest rate paid on liabilities such as bonds for BCs and deposits for the two commercial institution are compared to the annual 3 month Treasury bill (T-Bill). In general, the 3 month T-Bill rate plots a 'floor' below the BCs, Chase and the average commercial bank rates, with the interval being four percent or less in any one year between the T-Bill and the highest rate. It is expected that the T-Bill would provide such a floor since it is generally considered to be one least risky assets with a return rate that approaches risk free. The annual average rates for the period were 9.96% for the BC's, 8.86% for Chase and 11.25% for the average commercial bank (Table 4). The Treasury Bill's annual average was 8.75% over the period. The test statistics indicate that there was no significant difference between the BCs cost of funds and that of the commercial bank or Chase over this period. In fact, during the last six years the BCs cost of funds was above that paid by Chase and very similar to that of the average commercial bank.

The interest rate that the institutions received on loans is graphed along with the 3 month T-Bill in figure 5. Again as expected the T-Bill rate plots a risk free 'floor' below the other interest rates. The amount by which the interest rates received exceeds the T-Bill rate is significantly greater than that shown in figure 4 for interest rates on bonds and deposits. The interest rate on loans for commercial bank exceeds the T-Bill rate by about 10% in the early years, prior to the 1980 banking deregulation whereas the BCs rate follows the T-Bill rate fairly closely in the first five years, but starts to approach being competitive with Chase and the average commercial bank in the later years. The test statistics in the Table 5 indicate that the interest rates earned on loans for the three institutions are significantly different over the period.

As figures 4 and 5, show movements in both the interest rate on loans and the interest rate on bonds/deposits for the eleven year period are highly correlated with the 3 month Treasury bill. This is evident in figure 6 where the net margins are plotted for the institutions along with the T-Bill rate. The net interest rate margin for Chase and the average commercial bank show minimal variability and move between 4% and 7% for the entire period, with annual averages of 5.51% and 6.39% respectively (Table 6). The coefficient of variation is .136 for Chase and .072 for the average commercial bank. The BCs also exhibit minimal variability ranging from a low of .50% in 1982 to a high of 2.98% in 1987, with an annual average of 1.52%. However due to this relatively small net margin, the coefficient of variation is .54. This indicates that the net margin is somewhat riskier for BCs relative to the commercial system. The test statistic confirms a significant difference between the net margin for the BCs and the commercial banks.

## Conclusions

Several points can be made with respect to the results. First, much of the analysis is consistent with the theoretical differences concerning operating objectives of a cooperative versus an investor-owned firm. The lower interest rate paid by Bank for Cooperative borrowers and the ensuing low net interest margin supports stated operational differences. The relatively higher capital to asset ratio is appropriate given the BCs stock purchase requirements for its members. A possible inconsistency is that the return on assets for the BCs was on average superior for the period since it would be expected that the commercial firms with the stated objective of maximizing profit would earn higher profit. However, it is feasible that items such as agency status, BCs management practices, or conditions unique to BCs results in the favorable profitability measures. In addition, theoretically it can be argued that maximization of member wealth for a cooperative is not inconsistent with high levels of profitability.

An examination of the results would also seem to indicate that the forces of banking deregulation and the responses made by FCS to the financial crises in agriculture were forcing the BCs to a more competitive situation with the commercial banking system. This is evidenced by the increased liquidity of the BCs, and the trends toward comparable interest rates paid on interest-sensitive assets and interest received on loans during the last four to five years of the period examined.

The evidence is inconclusive with regard to the relative riskiness of the BCs versus Chase and the average commercial bank. The low net margin would strongly suggest that the BCs is more susceptible to highly variable market rate movements - this is supported somewhat by the higher coefficient of variation measured for the BCs. However given the strong capital position of the BCs plus possible operational efficiencies that result in the higher return to assets suggests that the lower net margin does not necessarily expose the BCs to undue risk.



Table 1: Liquidity

| Year                  | Bank for Cooperatives | Large Comm. Banks | Commercial Average |
|-----------------------|-----------------------|-------------------|--------------------|
| 1977                  | 1.0076                | 0.6757            | 0.6364             |
| 1978                  | 1.0141                | 0.7166            | 0.6719             |
| 1979                  | 1.0417                | 0.7783            | 0.7005             |
| 1980                  | 1.0018                | 0.7659            | 0.6794             |
| 1981                  | 1.0502                | 0.8236            | 0.7051             |
| 1982                  | 1.0699                | 0.8363            | 0.7097             |
| 1983                  | 1.0507                | 0.8382            | 0.7063             |
| 1984                  | 1.0432                | NA                | 0.7590             |
| 1985                  | 0.8849                | NA                | 0.7592             |
| 1986                  | 0.8809                | 0.8421            | 0.7567             |
| 1987                  | 0.8364                | 0.8327            | 0.7619             |
| 1988                  | 0.8443                | 0.8650            | 0.7756             |
| 1989                  | 0.8402                | 0.8793            | 0.7865             |
| 1990                  | 0.8377                |                   |                    |
| Average(77-89)        | 0.9666                | 0.8049            | 0.7237             |
| STD.                  | 0.0891                | 0.0607            | 0.0442             |
| t-value <sup>1)</sup> |                       |                   |                    |
| - BCs vs              |                       | 5.094             | 8.804              |
| - Comm.avg. vs        |                       | -3.788            |                    |
| Average(77-84)        | 1.0349                | 0.7764            | 0.6968             |
| STD.                  | 0.0226                | 0.0579            | 0.0331             |
| t-value <sup>2)</sup> |                       |                   |                    |
| - BCs vs              |                       | 11.700            | 23.887             |
| - Comm.avg. vs        |                       | -3.357            |                    |
| Average(85-89)        | 0.8574                | 0.8548            | 0.7688             |
| STD.                  | 0.0211                | 0.0184            | 0.0113             |
| t-value <sup>3)</sup> |                       |                   |                    |
| - BCs vs              |                       | 0.192             | 8.354              |
| - Comm.avg. vs        |                       | -8.749            |                    |

<sup>1)</sup> t Table ( $\alpha/2 = .025, DF = 24$ ) is 2.064

t Table ( $\alpha/2 = .025, DF = 22$ ) is 2.074

<sup>2)</sup> t Table ( $\alpha/2 = .025, DF = 14$ ) is 2.145

t Table ( $\alpha/2 = .025, DF = 13$ ) is 2.160

<sup>3)</sup> t Table ( $\alpha/2 = .025, DF = 8$ ) is 2.896

t Table ( $\alpha/2 = .025, DF = 7$ ) is 2.365

Table 2: Return on Assets

| Year                  | Bank for<br>Cooperatives | Commercial<br>\$1 bil.or > | Commercial<br>Average |
|-----------------------|--------------------------|----------------------------|-----------------------|
| 1977                  | 0.982%                   | 0.772%                     | 0.828%                |
| 1978                  | 1.161%                   | 0.839%                     | 0.871%                |
| 1979                  | 1.061%                   | 0.889%                     | 0.933%                |
| 1980                  | 1.407%                   | 0.864%                     | 0.852%                |
| 1981                  | 1.711%                   | 0.848%                     | 0.762%                |
| 1982                  | 1.564%                   | 0.775%                     | 0.710%                |
| 1983                  | 1.160%                   | 0.699%                     | 0.666%                |
| 1984                  | 1.305%                   | 0.816%                     | 0.651%                |
| 1985                  | 0.641%                   | 0.846%                     | 0.691%                |
| 1986                  | 0.006%                   | 0.622%                     | 0.621%                |
| 1987                  | 0.762%                   | 0.129%                     | 0.094%                |
| 1988                  | 0.707%                   | 0.878%                     | 0.825%                |
| 1989                  | 0.782%                   | 0.339%                     | 0.498%                |
| 1990                  | 0.507%                   |                            |                       |
| Average(77-89)        | 1.019%                   | 0.717%                     | 0.693%                |
| STD.                  | 0.4333                   | 0.2220                     | 0.2075                |
| t-value <sup>1)</sup> |                          |                            |                       |
| - BCs vs              |                          | 2.240                      | 2.451                 |
| - Comm.avg. vs        |                          | -0.288                     |                       |
| Average(77-84)        | 1.2939                   | 0.8130                     | 0.7843                |
| STD.                  | 0.2364                   | 0.0574                     | 0.0961                |
| t-value <sup>2)</sup> |                          |                            |                       |
| - BCs vs              |                          | 5.591                      | 5.648                 |
| - Comm.avg. vs        |                          | -0.725                     |                       |
| Average(85-89)        | 0.5796                   | 0.5629                     | 0.5458                |
| STD.                  | 0.2911                   | 0.2904                     | 0.2494                |
| t-value <sup>3)</sup> |                          |                            |                       |
| - BCs vs              |                          | 0.091                      | 0.198                 |
| - Comm.avg. vs        |                          | -0.095                     |                       |

Table 3: Capital to Ending Assets

| Year                  | Bank for<br>Cooperatives | Commercial<br>\$1 bil. or > | Commercial<br>Average |
|-----------------------|--------------------------|-----------------------------|-----------------------|
| 1977                  | 9.695%                   | 6.590%                      | 6.970%                |
| 1978                  | 10.397%                  | 6.328%                      | 6.879%                |
| 1979                  | 5.435%                   | 6.377%                      | 6.915%                |
| 1980                  | 9.094%                   | 6.336%                      | 5.798%                |
| 1981                  | 10.894%                  | 6.383%                      | 5.830%                |
| 1982                  | 12.545%                  | 5.563%                      | 5.874%                |
| 1983                  | 11.332%                  | 6.316%                      | 5.999%                |
| 1984                  | 11.977%                  | 5.132%                      | 6.151%                |
| 1985                  | 10.983%                  | 5.304%                      | 6.196%                |
| 1986                  | 10.951%                  | 5.513%                      | 6.195%                |
| 1987                  | 9.294%                   | 5.198%                      | 6.017%                |
| 1988                  | 7.651%                   | 5.585%                      | 6.286%                |
| 1989                  | 6.783%                   | 5.437%                      | 6.214%                |
| 1990                  | 6.450%                   |                             |                       |
| Average(77-89)        | 9.772%                   | 5.851%                      | 6.256%                |
| STD.                  | 2.01%                    | 0.52%                       | 0.39%                 |
| t-value <sup>1)</sup> |                          |                             |                       |
| - BCs vs              |                          | 6.818                       | 6.195                 |
| - Comm.avg. vs        |                          | 2.249                       |                       |
| Average(77-84)        | 10.171%                  | 6.128%                      | 6.302%                |
| STD.                  | 2.081%                   | 0.470%                      | 0.491%                |
| t-value <sup>2)</sup> |                          |                             |                       |
| - BCs vs              |                          | 5.361                       | 5.119                 |
| - Comm.avg. vs        |                          | 0.724                       |                       |
| Average(85-89)        | 9.132%                   | 5.407%                      | 6.182%                |
| STD.                  | 1.701%                   | 0.140%                      | 0.089%                |
| t-value <sup>3)</sup> |                          |                             |                       |
| - BCs vs              |                          | 4.880                       | 3.873                 |
| - Comm.avg. vs        |                          | 9.858                       |                       |

Table 4: Interest on Loans

| Year                  | Bank for<br>Cooperatives | Commercial<br>\$1 bil.or > | Commercial<br>Average |
|-----------------------|--------------------------|----------------------------|-----------------------|
| 1977                  | 7.032%                   | 16.219%                    | 15.207%               |
| 1978                  | 9.467%                   | 18.343%                    | 16.654%               |
| 1979                  | 11.291%                  | 21.940%                    | 19.521%               |
| 1980                  | 12.841%                  | 25.329%                    | 20.009%               |
| 1981                  | 14.920%                  | 29.858%                    | 21.753%               |
| 1982                  | 13.673%                  | 26.024%                    | 20.444%               |
| 1983                  | 11.118%                  | 20.299%                    | 17.298%               |
| 1984                  | 12.072%                  | %                          | 18.932%               |
| 1985                  | 11.777%                  | %                          | 16.026%               |
| 1986                  | 11.366%                  | 12.829%                    | 14.258%               |
| 1987                  | 10.722%                  | 13.486%                    | 13.961%               |
| 1988                  | 11.686%                  | 14.480%                    | 14.859%               |
| 1989                  | 12.370%                  | 15.802%                    | 16.299%               |
| 1990                  | 11.630%                  |                            |                       |
| Average(77-89)        | 11.564%                  | 19.510%                    | 17.325%               |
| STD.                  | 1.85%                    | 5.41%                      | 2.46%                 |
| t-value <sup>1)</sup> |                          |                            |                       |
| - BCs vs              |                          | -4.980                     | -6.761                |
| - Comm.avg. vs        |                          | -1.309                     |                       |
| Average(77-84)        | 11.552%                  | 22.573%                    | 18.727%               |
| STD.                  | 2.313%                   | 4.414%                     | 2.036%                |
| t-value <sup>2)</sup> |                          |                            |                       |
| - BCs vs              |                          | -6.180                     | -6.587                |
| - Comm.avg. vs        |                          | -2.218                     |                       |
| Average(85-89)        | 11.584%                  | 14.149%                    | 15.080%               |
| STD.                  | 0.540%                   | 1.121%                     | 0.933%                |
| t-value <sup>3)</sup> |                          |                            |                       |
| - BCs vs              |                          | -4.555                     | -7.251                |
| - Comm.avg. vs        |                          | 1.364                      |                       |

Table 5: Interest on Deposits

| 2 | Year                  | Bank for Cooperatives | Commercial \$1 bil.or > | Commercial Average |
|---|-----------------------|-----------------------|-------------------------|--------------------|
|   | 1977                  | 5.602%                | 10.818%                 | 8.497%             |
|   | 1978                  | 7.965%                | 13.208%                 | 10.201%            |
|   | 1979                  | 10.255%               | 18.359%                 | 13.759%            |
|   | 1980                  | 11.706%               | 22.650%                 | 14.030%            |
|   | 1981                  | 13.786%               | 26.665%                 | 15.078%            |
|   | 1982                  | 13.178%               | 21.745%                 | 13.341%            |
|   | 1983                  | 10.334%               | 15.280%                 | 10.325%            |
|   | 1984                  | 11.191%               | %                       | 12.146%            |
|   | 1985                  | 9.418%                | %                       | 9.901%             |
|   | 1986                  | 8.414%                | 9.931%                  | 8.406%             |
|   | 1987                  | 7.747%                | 9.165%                  | 8.031%             |
|   | 1988                  | 8.333%                | 9.903%                  | 8.662%             |
|   | 1989                  | 8.996%                | 11.777%                 | 10.206%            |
|   | 1990                  | 8.256%                |                         |                    |
|   | Average(77-89)        | 9.763%                | 15.409%                 | 10.968%            |
|   | STD.                  | 2.21%                 | 5.77%                   | 2.33%              |
|   | t-value <sup>1)</sup> |                       |                         |                    |
|   | - BCs vs              |                       | -3.266                  | -1.354             |
|   | - Comm.avg. vs        |                       | -2.549                  |                    |
|   | Average(77-84)        | 10.502%               | 18.389%                 | 12.172%            |
|   | STD.                  | 2.510%                | 5.234%                  | 2.138%             |
|   | t-value <sup>2)</sup> |                       |                         |                    |
|   | - BCs vs              |                       | -3.805                  | -1.433             |
|   | - Comm.avg. vs        |                       | -3.091                  |                    |
|   | Average(85-89)        | 8.582%                | 10.194%                 | 9.041%             |
|   | STD.                  | 0.576%                | 0.964%                  | 0.856%             |
|   | t-value <sup>3)</sup> |                       |                         |                    |
|   | - BCs vs              |                       | -3.136                  | -0.996             |
|   | - Comm.avg. vs        |                       | 1.902                   |                    |

Table 6: Net Margin

| Year                  | Bank for | Commercial<br>Cooperatives | Commercial<br>\$1 bil. or > | T-Bill<br>Average | 3 Mo.  |
|-----------------------|----------|----------------------------|-----------------------------|-------------------|--------|
| 1977                  | 1.430%   | 5.400%                     | 6.710%                      | 5.26%             |        |
| 1978                  | 1.502%   | 5.136%                     | 6.452%                      | 7.22%             |        |
| 1979                  | 1.036%   | 3.581%                     | 5.763%                      | 10.04%            |        |
| 1980                  | 1.135%   | 2.679%                     | 5.979%                      | 11.51%            |        |
| 1981                  | 1.135%   | 3.193%                     | 6.675%                      | 14.08%            |        |
| 1982                  | 0.495%   | 4.279%                     | 7.103%                      | 10.69%            |        |
| 1983                  | 0.784%   | 5.019%                     | 6.973%                      | 8.63%             |        |
| 1984                  | 0.881%   |                            | 6.787%                      | 9.58%             |        |
| 1985                  | 2.360%   |                            | 6.125%                      | 7.47%             |        |
| 1986                  | 2.952%   | 2.897%                     | 5.852%                      | 5.98%             |        |
| 1987                  | 2.975%   | 4.321%                     | 5.930%                      | 5.82%             |        |
| 1988                  | 3.353%   | 4.577%                     | 6.197%                      | 6.69%             |        |
| 1989                  | 3.373%   | 4.025%                     | 6.092%                      | 8.12%             |        |
| 1990                  | 3.373%   |                            |                             | 7.51%             |        |
| Avg.(77-89)           |          | 1.801%                     | 4.101%                      | 6.357%            | 8.544% |
| STD.                  |          | 1.01%                      | 0.88%                       | 0.43%             | 2.46%  |
| t-value <sup>1)</sup> |          |                            |                             |                   |        |
| -BCs vs               |          |                            | -5.906                      | -14.987           |        |
| -Comm.avg. vs         |          |                            | 8.185                       |                   |        |
| Avg.(77-84)           |          | 1.050%                     | 4.184%                      | 6.555%            | 9.626% |
| STD.                  |          | 0.310%                     | 0.978%                      | 0.438%            | 2.513% |
| t-value <sup>2)</sup> |          |                            |                             |                   |        |
| -BCs vs               |          |                            | -8.618                      | -28.99            |        |
| -Comm.avg. vs         |          | -6.204                     |                             |                   |        |
| Avg.(85-89)           |          | 3.002%                     | 3.955%                      | 6.039%            | 6.812% |
| STD.                  |          | 0.368%                     | 0.641%                      | 0.128%            | 0.880% |
| t-value <sup>3)</sup> |          |                            |                             |                   |        |
| - BCs vs              |          |                            | -2.820                      | -17.433           |        |
| - Comm.avg. vs        |          | 7.213                      |                             |                   |        |

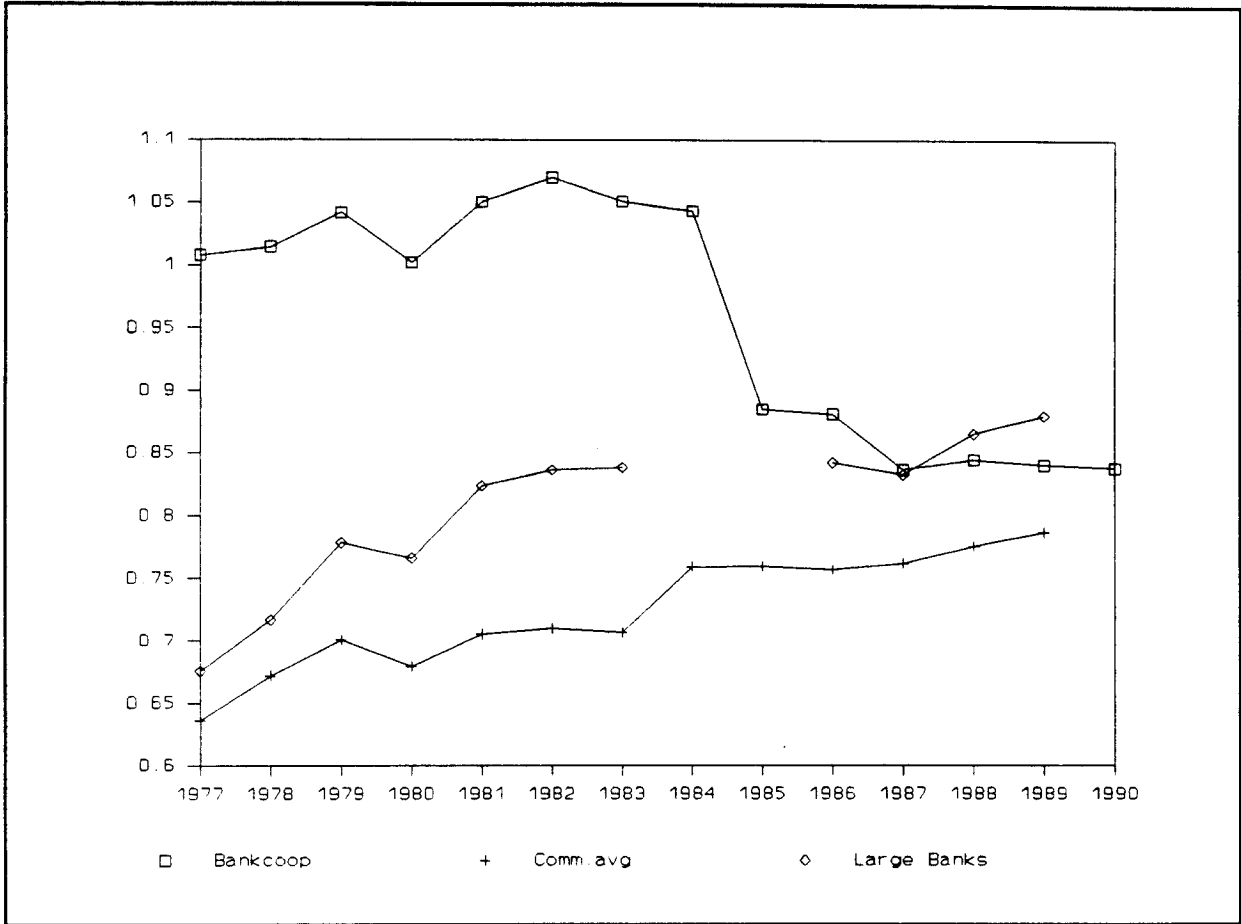
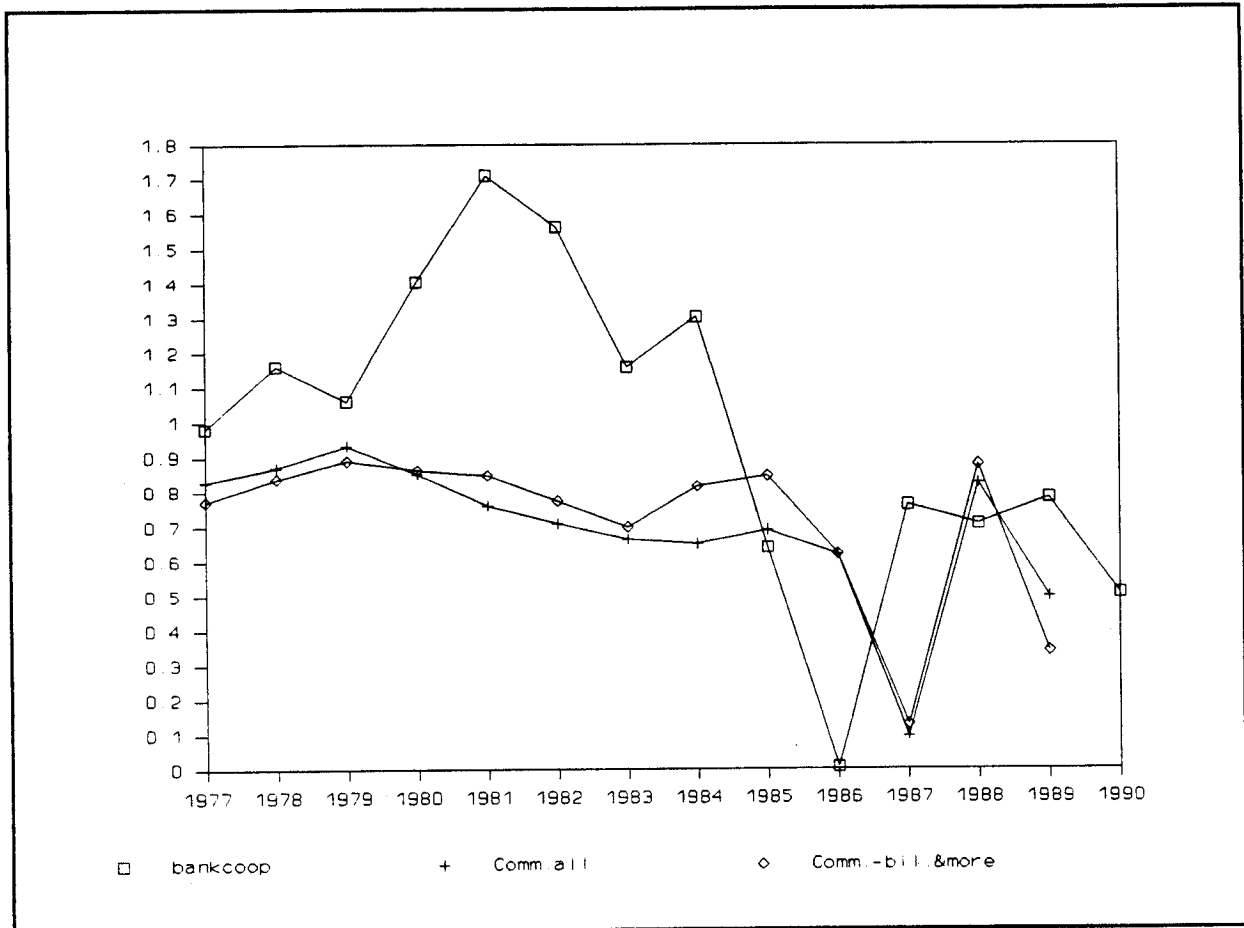
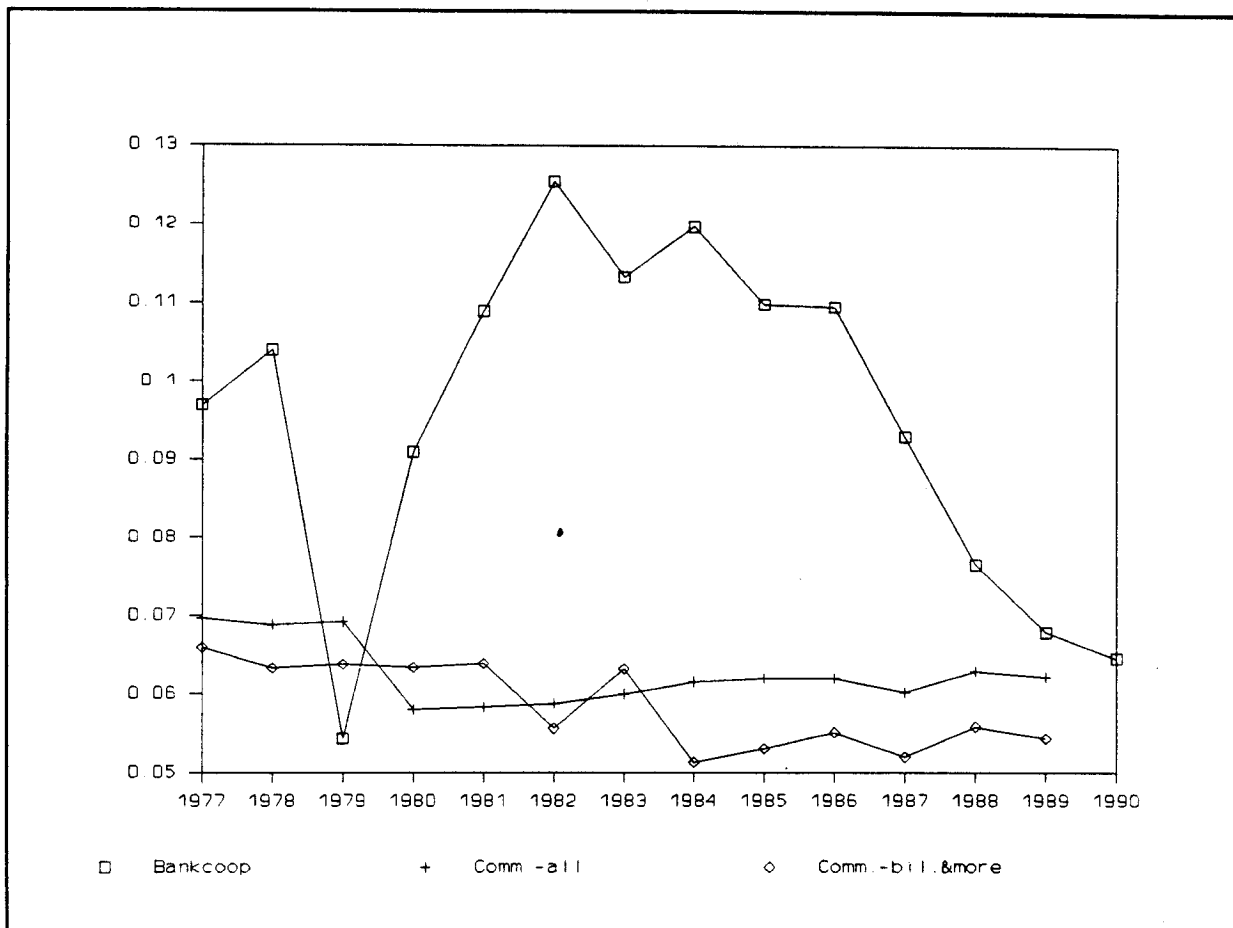


Figure 1. Liquidity of the Banks for Cooperatives, Commercial Average and Large Commercial Banks, 1977-1990.



**Figure 2.** Return on Assets of the Banks for Cooperatives, Commercial Average and Large Commercial Banks, 1977-1990.





**Figure 3.** Capital to Ending Assets of the Banks for Cooperatives, Commercial Average and Large Commercial Banks, 1977-1990.

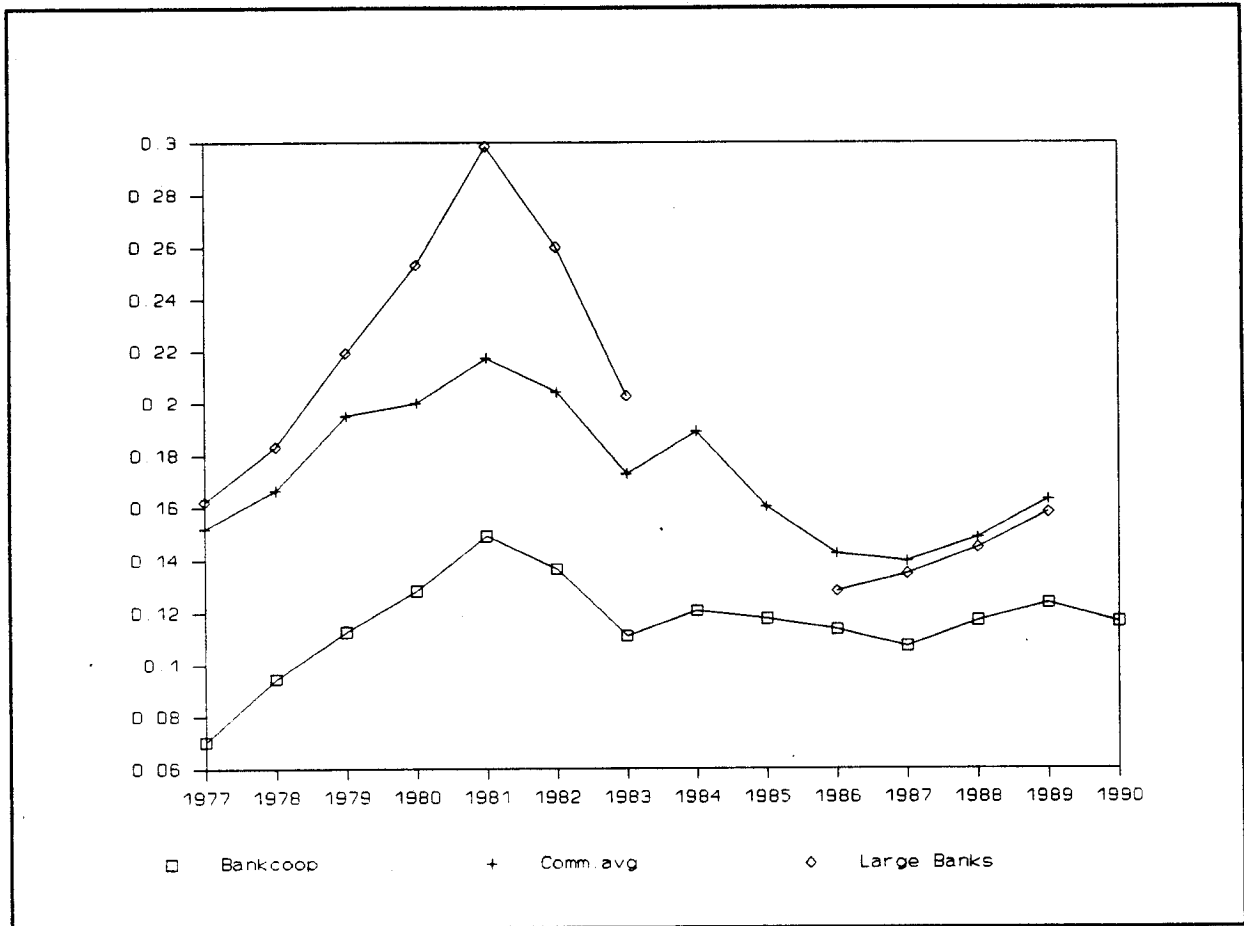
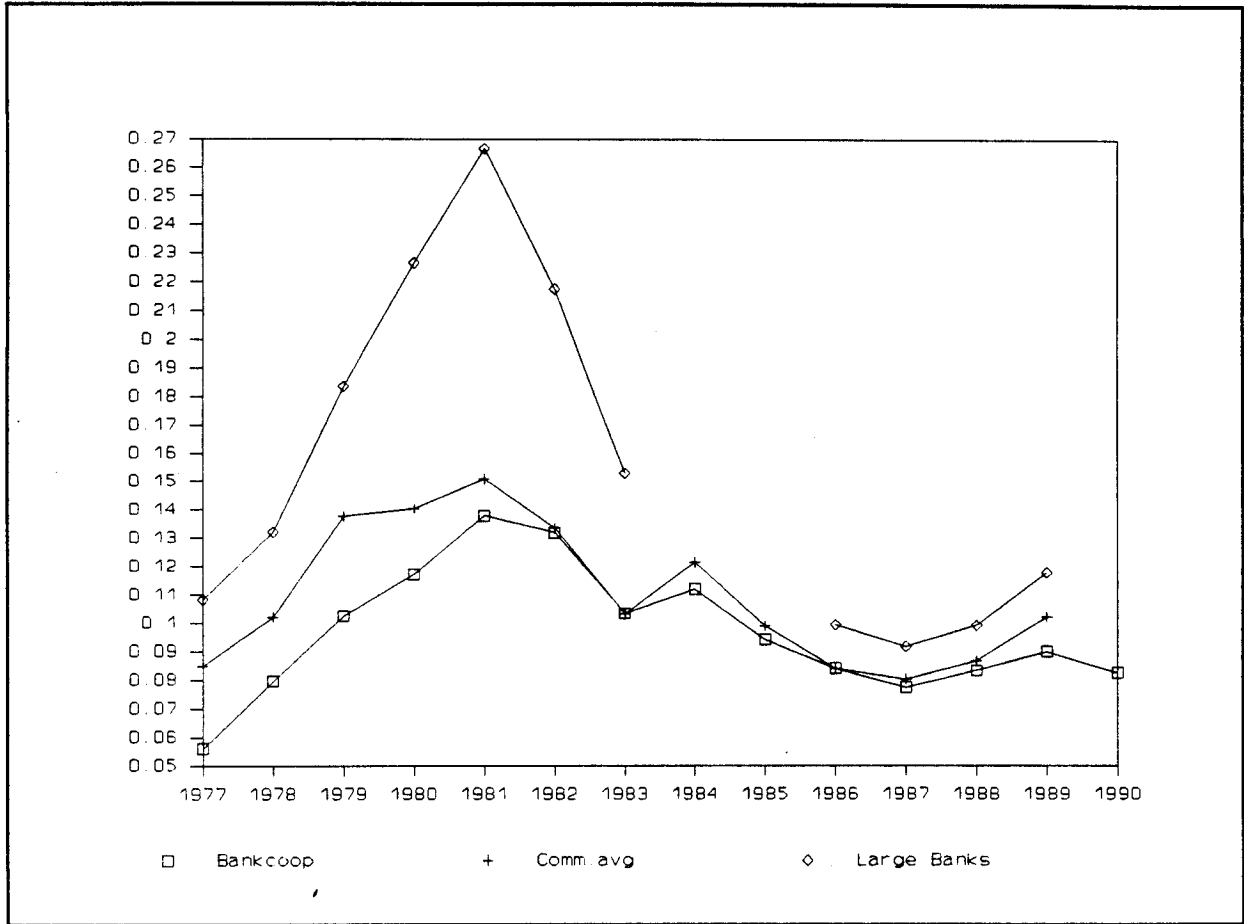
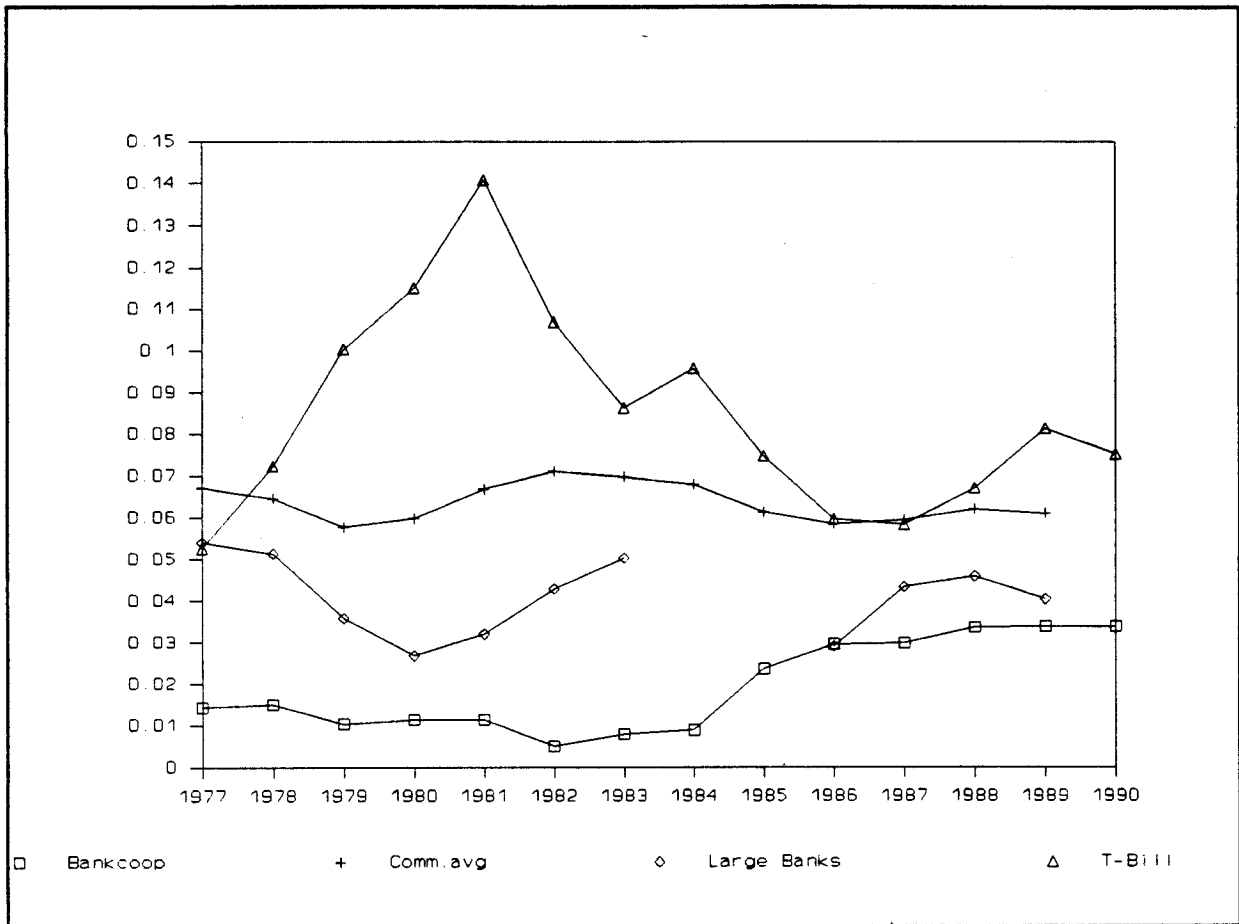


Figure 4. Interest on Loans of the Banks for Cooperatives, Commercial Average and Large Commercial Banks, 1977-1990.



**Figure 5.** Interest on Deposits of the Banks for Cooperatives, Commercial Average and Large Commercial Banks, 1977-1990.



**Figure 6.** Net Margin of the Banks for Cooperatives, Commercial Average, Large Commercial Banks and T-Bill, 1977-1990.

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### Endnotes

1. The cooperative bank of St. Paul and Springfield remain as Banks for cooperatives in their respective districts.
2. This is analogous to the more familiar current ratio (current assets divided by current liabilities) used for the analysis of non-financial institutions.
3. In order to detect significant differences and similarities Bank for Cooperatives, Chase Manhattan Bank as well as the commercial average time series of data were analyzed using a mean hypothesis test.