

# The Significance of Automation for Bank Supervision and Bank Examination \*

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## I. Introduction

The Federal Deposit Insurance Corporation initiated a major expansion of its efforts in the areas of research and automation development in 1966. The decision to devote additional resources to these two sectors was motivated largely by the changing environment within the business community, accelerated by the introduction of automated computer systems.

The primary purpose of this article is to describe current FDIC research and automation programs relating to the examination of banks and to discuss the concepts as well as some of the problems which can be expected to have a direct impact on bank examinations in the future as a result of the continued development of automated systems in banking. First, however, I would like to describe briefly the FDIC's role in the bank examination process.

## II. The FDIC and Bank Examinations

The FDIC, while concerned with all insured banks, has primary responsibility at the Federal level for the examination of banks which are not members of the Federal Reserve System. The FDIC works in close liaison with State bank chartering authorities, who are the primary supervisors, in performing this task.

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The main purpose of bank examinations by the FDIC -- and the other bank supervisory agencies -- is protection of the public's interest through direct evaluation of: the bank's current and future solvency; the legality of the bank's operations; bank management; policies and procedures; and the overall strength of the bank in its geographic and economic environment. The FDIC is also concerned from a supervisory standpoint with providing information to bank management which will aid banks in improving their operations as well as in meeting the new challenges of automation. This information is also of indirect immediate benefit to the banks involved, in the management of their institutions.

Because banking is endowed with a strong public-interest element, service to the public is a primary concern of banks. Accordingly, banks and bank supervisors must assume the responsibility and take the lead in anticipating and providing the means to satisfy the changing financial needs of the public through the new technologies. The bank examiner has a unique and special role, as he is immediately responsible for evaluating the performance of banks and assisting them in this era of technological change.

At the present time, a large number of banks examined by the FDIC do not maintain research staffs or utilize computer systems. This situation has been recognized in the Corporation's planning for research and automation development programs, in which both the bank examiner and

bank manager are involved. The bank examiner, with the experience gained from specialized training and from examination of automated banks, will be able to provide valuable supplemental information of general interest to all bankers.

In the examination of automated banks, a bank examiner acquires an understanding of how basic systems function, how results are produced, and what controls and safeguards must be instituted and utilized to insure that the systems are not compromised. He does not have to be a skilled computer technician, but he must become directly involved in understanding and examining the management of bank computer applications. This will require a continuing training program so that he may be currently informed about the revolutionary changes occurring in the banking industry. This knowledge in turn can be communicated to the banking industry. In the process, the FDIC will continue to take all necessary precautions to protect the confidentiality of information to which we have access.

### III. FDIC Research and Automation

#### Programs Relating to Bank Examination

The FDIC's current research and automation programs have necessitated a substantial investment in equipment and technical personnel and the development of basic capabilities to provide the foundation for specific applications. In 1966, the Corporation received delivery of an

IBM 360/30 computer which has since been expanded to a IBM 360/40 system. This system has recently been augmented with multiple disk units, cathode ray display consoles, and XEROX equipment which reduces and reproduces computer printouts. The technical staff has been expanded and supplemented when necessary by support from industry and academic organizations.

\*(Note -- Picture with Chairman Randall and some other Executives reviewing work on bank simulation model.)

The FDIC research and automation development programs are designed -- among other objectives -- to provide new tools for use in the examination process and in analyzing the results of examinations. Some programs are designed for use in training of examiners. All these programs are continually being reappraised and reviewed to keep pace with the current state of knowledge and with the applicability of advances in new technology.

Some of the FDIC programs which provide current support to examiners or establish a base for future development of automated examination support systems are described in the following paragraphs.

#### A. Orientation Course for the Examination of a Computerized Bank

The FDIC has developed a course for examination of a computerized bank with the assistance of Peat, Marwick, Mitchell and Company. The bank examiner, as a prerequisite, must have had in some form an introductory

course on computers. The FDIC course then provides specific information on how computers are used in banking operations. Emphasis is placed on those areas most relevant to bank examination, such as evaluation of a bank's auditing procedures for its computer operations, maintenance of appropriate records, and establishment of proper procedures and controls to prevent unauthorized access to the automated systems. The examiner is also provided with a comprehensive checklist of areas which should be considered when evaluating automated banking operations. A field trip to an automated bank is included in the course.

One pilot session was conducted in Washington, D. C. and the course is now available in other areas to provide the opportunity for examiners in our fourteen FDIC District Offices to attend one of the sessions. The FDIC is planning to offer this course to other supervisory authorities once the course has been thoroughly evaluated within the Corporation and various problems resolved and necessary refinements added.

#### B. Bank Management Simulation Model

The Carnegie-Mellon University, under an FDIC grant, is developing a simulated model of the management situation in a commercial bank, which will be demonstrated initially at the Stonier Graduate School of Banking at Rutgers University in June 1968. Each participating team in the simulation model represents a hypothetical bank making management

decisions. These teams' decisions react and interact and cause each bank's financial position to improve or deteriorate in accordance with the teams' relative ability to make decisions. Each team can establish goals and objectives prior to the start of the game and then evaluate its own performance in light of these goals and objectives. The model can be used to study the implications and ramifications of various management decisions.

The bank simulation model offers a new dimension in training for bank examiners. It provides an overall view of bank operating and policy problems that is difficult to gain in any other way in this day of increasing specialization. The examiner can use the model to familiarize himself with new bank management techniques which may become routine by the 1970's and, after initial use of the model, the examiner will also be in a position to recommend future improvements. The model can further be adapted as a training device for bank management.

### C. FDIC Management Information System

In processing the regular reports of condition and of income and dividends, as well as the survey of deposits and other data, received from banks, the FDIC has developed computer programs which are evolving into an integrated management information system. Data on the nation's 14,000 banks are being stored in computerized files. This management

information is then ready to be processed and analyzed whenever needed for use in bank supervision. Data are also being extracted from FDIC examination reports and placed in the computer files.

The FDIC management information system has provided the capability to produce individual bank comparison tables for 309 geographic areas in the United States. The December 1967 call reports were processed in this manner and distributed to the reporting banks. The favorable response of banks to these statistical tables indicates that the FDIC has reached a major milestone in information processing. Although still subject to some analytical limitations and in need of additional refinements, the information has been made available to the FDIC Supervising Examiners as a new aid in assessing the relative balance sheet and operating positions of banks within their respective areas of interest.

The FDIC Management Information System provides the base for further development of specific information services which will directly support the work of the Supervising Examiners and their field examination staff, and will be available to the other supervisory agencies. The Research Division is currently conducting a study of District Office requirements for automated data processing in its planning for new programs and expects this study to lead to the introduction of on-line terminals between the District Offices and the Corporation's Washington Office computer facilities within the near future.

#### D. Revision of FDIC Bank Examination Reports

The FDIC is also in the process of revising its bank examination reports. One of the considerations in this task is to modify the reports, where possible, to make them better adapted to computerized processing. At the same time, the FDIC is experimenting with new equipment which converts data directly to magnetic tape for computer processing as the examination reports are being typed in the District Offices. The results of these projects have yet to be evaluated. However, the timely processing of examination reports with computer analysis will provide post-examination management information reports which can aid examiners in the future in their evaluations and review with bank management of an examination. The bank examination reports also are the source of valuable data which could be sampled, through more rapid processing techniques, to identify significant changes within the banking industry.

#### E. Selection of Loans to be Examined

A computerized method of selecting individual loans to be evaluated during an examination is in the process of development by the FDIC. The method involves a statistical analysis of the types of loans in a bank's portfolio and, based on sampling theory and linear programming techniques, indicates the number of loans which should be examined in each category -- on the basis of certain decisions as to the extent of loan

sampling desired. The method will soon be tested for feasibility in actual bank examinations. The parameters will be selected by the examiner on the basis of his previous experience with that bank or similar banks and his judgment concerning possible changes in economic conditions or other factors. If the method proves workable, it could contribute to more efficient examinations and better utilization of all available information.

F. FDIC Study of the Impact of Computers and EDP on Managerial and Organizational Behavior in Small- to Medium-Sized Banks

A research team from the University of Pittsburgh recently completed a study of the impact of computers and EDP on managerial and organizational behavior in small to medium-sized banks under a contract awarded in 1967. The results will be published in the near future because of widespread interest in the subject throughout the banking industry. The study discusses topics such as the bank's decision to automate, the conversion period, the impact of the computer on the information system, effects of automation on banking jobs, attitudes of bank personnel toward use of computers, and computer staffing requirements.

In addition to providing considerable insight on the types of problems that bank managers must resolve in implementing automated systems, the report will help the FDIC in determining what should and can be done from the supervisory standpoint.

The above programs reflect a recognition by the FDIC of the challenges and problems of automation for both banks and bank supervisors. The majority of these current FDIC research and automation programs relate very closely to the examination of banks. This emphasis will become increasingly evident as new programs based on these initial programs are developed for support of examination activities and as both the supervisors and banks rely more heavily on automated data processing systems.

#### IV. Future Problems and Concepts in Bank Automation and Their Impact on Bank Examinations

Automation and computers in banks are obviously here to stay. As bank supervisors, it is important that we be prepared to deal with both present and potential problems and with their implications. Automation does not alter the objectives of bank management, auditors, and bank supervisors, but practices and procedures must be changed if the benefits of automated banking systems are to be maximized and problems minimized.

The Wall Street Journal, in April 1968, for example, reported on the dangers of dishonest computer specialists embezzling company funds. The report also described some of the safeguards which might aid in preventing the misuse of automated systems in performing financial transactions. Certainly, the introduction of automation could provide yet another avenue

for the manipulation of records and embezzlement of funds by the unscrupulous. Proper internal controls must therefore be developed.

To take advantage of computerization and to lower costs, many transactions now posted on ledger pages will take place or be recorded only within the new devices of automated systems. In many instances the computer will automatically perform the transaction under the control of a program designed and operated by computer specialists. Audit and examination procedures will therefore have to be modified further to incorporate into the automated design many of the audit functions -- in order to insure proper maintenance and review of essential reports.

The types of automated systems and the directions in which they evolve may also vary. Several types of automated systems are presently in use or being implemented within the banking industry. Computer processing may be performed on-site or at a remote location, i.e., a correspondent bank or service bureau. The bank may transport inputs and receive outputs via courier or have on-line transmission devices using telecommunications. The on-site computer may process only information collected manually and brought to the bank's computer facility, or the teller windows and branches may be connected directly for immediate processing of transactions. In either case, remote or on-site, there are definite distinctions between on-line, real-time, and off-line computer operations. Present systems may evolve in turn into integrated and simultaneous operations which support both routine banking functions and

bank management by providing analytical and information services. This is the trend that is likely to become commonplace in banking during the mid-seventies.

The FDIC is considering the feasibility of eventually providing on-line computer support to bank examiners directly within or near the bank being examined. This is an evolutionary process and will require three major phases of development. The initial research and development programs previously discussed are part of the first phase of this development. The second phase will consist of providing on-line terminals and computer services to FDIC District Offices. The third phase will involve the extension of on-line computer support to examiners in the field. This system can evolve as an integral part of an overall FDIC Management Information System -- with many of the basic characteristics of automated banking systems.

Conceptual studies have been completed for the FDIC concerning the feasibility of management information system for the Corporation for supervisory purposes. These studies conclude that on-line, remote terminal service can be provided to District Offices within two or three years, while extended on-line services directly to banks in the field may take five or seven years -- once the decision is made -- to become fully operational.

One can visualize in a crystal ball a "control center" for bank examinations, with a senior team leader supervising assistants located

in several banks under examination and specialists at the central computer facility providing special analytical reports and information to assist in further investigations. The entire multiple-bank examination team would be supported by an automated, interconnected, on-line system which combines all information obtained from investigations and other sources into a completed examination report ready for immediate review and evaluation. The mechanics of such an examination system may not be as fantastic or unattainable as we might think. It is a fascinating prospect to contemplate.

Thus, there are many different types of automated systems which may evolve in the future to assist bank examiners. Success in developing these system and in deriving full benefit from them will depend on the extent to which the Federal and State supervisory agencies and their operating staffs are willing to become involved in the use of automation. Automation can be a help and not a hindrance. There are many prototype programs to be tested and much experience to be gained before the final approaches can be defined. An important consideration concerning tomorrow's systems is how well we develop new methods today.

In the process of taking advantage of these new technologies, however, the supervisory authorities must take care never to lose sight of the fact that the substance of bank examination remains the most important consideration. What are the factors that must be considered in evaluating a bank's performance? What types of information are essential

for the examiner in the field and the supervisor? And what are the problems of the banking industry? The new systems serve primarily a supporting and not a leading role in our supervisory efforts. Nevertheless, it is a tool that should not be ignored.

In the near term, bank examiners should become increasingly involved in familiarizing themselves with the new automated methods which support their training and aid them in conducting bank examinations -- and in offering suggestions for new applications. The examiner should participate in these new developments as they are being tested in the field and in courses offered on basic fundamentals and the application of computers to banking systems. In this way, he can become a constructive critic and a pioneer in developing automated examination procedures and techniques which will be routine in the future. A current example of this kind of activity are the plans for field testing of the FDIC automated loan selection method. FDIC examiners will soon begin preliminary testing, and the Massachusetts State banking authorities have shown considerable interest in using sampling techniques in their examinations. New paths are being charted and a continuation of close coordination and cooperation between bank supervisors at the Federal and State levels will enable them to make more rapid progress.

Bank examiners and bank supervisors can become major participants and contributors in development of an automated bank examination system

for their own use, because the computer specialist, without their assistance, has only limited knowledge of the examination process and its requirements. The active participation of both groups is therefore essential for progress.