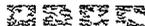


# Government Securities Book-Entry System: Fact-Gathering and Evaluation Report

The Egypt Capital Markets Development Project



CHEMONICS INTERNATIONAL INC.



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## TABLE OF CONTENTS

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I Introduction	1
II The Current Environment for Government Securities	2
A Central Bank of Egypt	
B The Primary and Secondary Markets	
1 Treasury Bills (T-Bills)	
2 Treasury Bonds (T-Bonds)	
3 Repurchase Agreements (Repos)	
C Technology	
III Analysis of Prerequisites for a Book-Entry System	5
A Identification Methods	
1 Bank Numbering	
2 Securities Numbering	
B Level of Accounting for Securities	
C Method of Payment	
IV Conclusions	8
Appendix Organizations and Individuals Contacted	

## **GOVERNMENT SECURITIES BOOK-ENTRY SYSTEM**

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### **Fact-Gathering and Evaluation Report**

#### **I Introduction**

This report summarizes the fact gathering that was conducted to gain familiarity with the current environment for securities in Egypt. The report also presents evaluations of several items that needed to be resolved prior to developing the requirements document.

In order to gain a proper perspective, it was important to gather information from the variety of organizations that participate in different aspects of the government securities market. The information was obtained through interviews that were held with the Central Bank of Egypt (CBE), banks, brokers, and others involved in that market. They would become the users of the new book-entry system and the ones the system must serve.

The current operations at the Central Bank were reviewed and analyzed in order to determine how an automated book-entry system would affect them. Accordingly, several meetings and discussions were held with the management and staff of the departments responsible for the processing of the two types of government securities—Treasury Bills (T-Bills) and Treasury Bonds (T-Bonds).

Several commercial banks were interviewed—three located in Cairo and two located in Alexandria—for the purpose of assessing the current bank environment. It also helped in evaluating the banks' degree of familiarity with, and interest in, book-entry securities. The discussions also helped in judging the banks' readiness and willingness to process this new form of securities, in electronic form instead of in certificate form. Discussions with the management of banks located in Alexandria helped in determining where the authority lies in making decisions concerning the buying and selling of securities. Is it a centralized function at the main office or is there authority at other locations? With a book-entry system in place, banks will then have the opportunity to decide whether decision-making responsibilities for securities will be centralized or de-centralized within their organization.

Interviews held with a large broker helped in determining the current secondary market activity in bonds and the anticipated growth rate. This helped in judging the additional growth that could be attained, when government securities are converted to book-entry form.

The following important factors were evaluated so that they could be resolved prior to beginning the requirements document:

- The coding (numbering) systems currently in use in Egypt, and planned to be used, for identifying banks and securities. Numbering systems are considered to be essential components of automated systems.
- The payment and accounting systems currently in use and planned. The ability to debit and credit current accounts is a key factor in determining which functions should be included in the book-entry system for Egypt.
- An assessment of the ability of the securities market participants to use multiple levels of accounting to identify the beneficial owners of securities. The hierarchical approach to maintaining securities records is discussed in this report.

Apparently, there are no legal impediments to issuing book-entry securities and maintaining the records of ownership in electronic form.

## II The Environment for Government Securities

The following is a summary of the information that was gathered regarding the government securities market as it exists today

### A The Central Bank of Egypt

The CBE was the main contact for obtaining facts that are important for developing a book-entry system. It is the fiscal agent for the Ministry of Finance for both T-Bills and T-Bonds. The CBE also has the normal central bank supervisory and regulatory responsibilities for banks, which will be major participants in the new book-entry system. Finally, when implemented, the book-entry system would be the Central Bank's system to run.

CBE management gave overall descriptions, from their perspective, of the primary and secondary markets as they exist today in Egypt. The information gathered from the CBE and later from banks and others, is summarized in the sections that follow. Central Bank management and staff were at all times courteous and forthcoming in the various discussions that were held and in the reviews of their operations.

Management and their staffs expressed an interest and desire to convert to a book-entry system. This interest (and also some anticipated, but minimal, resistance to change) was evident in discussions that centered upon book-entry concepts. They fully realized that the new system would help them eliminate the time-consuming and labor-intensive handling of paper certificates.

After the reviews of operations at the Central Bank, it became apparent that extensive manual processing exists and that the degree of automation needs to be upgraded substantially. Although the training of personnel and the preparation of good documentation are essential tasks in any automation project, it needs to be especially emphasized in this project. Management and staff will need to gain experience with computer systems and with securities that will exist only in electronic form. Finally, a secure physical environment is an essential requirement for the book-entry system.

### B The Primary and Secondary Markets

Different policies have been established and different approaches have been taken for T-Bills as opposed to T-Bonds. For example, under Egyptian Law, Treasury Bonds are classified as securities. They must be listed and can be traded on the stock exchange three months after they are issued. T-Bills are classified as commercial instruments and are not listed. T-Bills are generally viewed as instruments for investment purposes, not as tradable instruments. They can be traded privately.

Another difference is that initial issues of T-Bills are auctioned. Thus, the market determines the price and effectively the interest rate. T-Bonds are offered, by subscription, at a fixed rate and sold at prices set by the MOF.

#### 1 Treasury Bills (T-Bills)

As mentioned, T-Bills are thought of as primary market instruments, not as secondary market tradable ones. The bills are issued and the money is received by the CBE on behalf of the MOF. Whether or not any trades later take place is of little or no concern to the CBE or the MOF. (Book-entry and the ease with which trades can be made and settled may change that perception.)

T-Bills are auctioned and issued twice a week. Since they are not traded, the auction represents the "market" for T-Bills. The MOF decides on the weekly amounts and maturity length of the

bills to be auctioned. Notice of the auction is published with the necessary descriptive information.

As part of reviewing CBE operations, an auction of T-Bills was witnessed. The CBE conducts the auctions. All bids that are received are 'competitive'—i.e., bids must include a bid price. Non-competitive bids (which indicate a willingness to buy at the price set by the auction) are not accepted. The bid (or "tender") is submitted on a form up until the day of the auction. Typically, banks submit several bids—one for themselves and one for each customer. Payments must accompany the bids, except for banks. Debits are made to their current accounts if their bid is accepted. The auction is usually oversubscribed, indicating that there is an adequate demand in the primary market for T-Bills.

After the deadline for accepting bids is reached, the envelopes containing the bids are opened and the bid information is logged into a ledger. The pertinent bid information is keyed into a small computer, which is used to tabulate the bids. The grand total is verified by running an adding machine tape from the original bid sheets that were received. A listing of the bids is generated in descending order, together with cumulative totals. The cutoff bid is then chosen based on where the cumulative total is approximately equal to the total amount being offered. The total of the bids accepted can be + or - 10% of the total offering. A weighted average is taken to calculate the interest rate. The minimum, average, and maximum bids are published two days after the auction.

Because T-Bills are not thought of as tradable instruments, there is no secondary market as such. However, they can be traded privately and endorsed to the new beneficial owner. At maturity, the bills are brought in to the CBE along with proper identification. The bills are redeemed and payments are made to the holders.

## 2 Treasury Bonds (T-Bonds)

The MOF sets the total amount of the bond to be issued and the maturity date. However, instead of holding an auction, as is done for T-Bills, the MOF sets the interest rate, the price for bonds, and the subscription period. If the issue is over-subscribed, the bonds are issued on a pro-rata basis. For the first time, on the last issue (March 1999), a bond issue was under-subscribed. The CBE bought the remainder of the issue, apparently based on a joint decision by the MOF and CBE. It is not clear if this is an established policy that will be followed for any future under-subscribed issues.

A secondary market exists for T-Bonds, which are listed on the Cairo and Alexandria Stock Exchanges (CASE). They can be traded through brokers only. About six T-Bonds have been issued to date and are available for trading. The current secondary market activity is estimated to be about 100 per month. The activity is expected to increase, but it is difficult and too soon to estimate the growth rate. Of significance is that the largest broker has just formed a fixed income department, indicating it expects trading activity to increase sufficiently to warrant a separate department.

It is interesting that a different organization than the Central Bank is the depository for T-Bonds, but not for T-Bills, again based on a different policy and philosophy. Misr for Clearing, Settlement, and Depository (MCSD) was established mainly to clear and settle equities that were traded. It also clears and settles bonds—mainly corporate—including T-Bonds. MCSD receives the settlement information from trades that took place on the stock exchange (CASE).

Paper certificates are still used, causing the usual problems and delays associated with the settlement process. Settlement normally takes place three days after the trade date, on T+3 (some

say it is frequently T+4) Settlements that require delivery outside of Cairo experience further delays reportedly up to a week

Currently an effort is underway at the depository (MCSD) to immobilize paper certificates. At this time it is estimated that about 75% of trades are settled on the books of the depository without needing to go through the process of endorsing certificates. This should facilitate settlement and could reduce the time interval between trade and settlement.

MCSD has the degree of automation necessary to handle the work of a depository. Back-up computers are available in the event the main computer fails. Additional processors are located at another site in Cairo and in Alexandria and can be used for backup purposes and disaster recovery. The software is based on the French system, SICOVAM. However, the exchange has purchased another system from Canada which may be considered as a replacement. This makes one wonder if there may be system problems that were not discussed or whether the system has volume constraints.

### 3 Repurchase Agreements (Repos)

The Central Bank of Egypt provides liquidity to banks through the use of Repurchase Agreements. The Repos are always of 6 or 14 days duration, set at the discretion of the Central Bank. The CBE faxes the desired Repo amount to the banks and receives the banks' bids by fax. The banks then endorse the certificates and deliver them to the Central Bank and their current accounts are credited. At the end of the Repo period, the CBE returns the certificates and debits the banks' current accounts. At least one major bank places Repo activity under the control of its risk-management division.

Currently, there seems to be no Repo activity between banks. However, several banks were aware of the benefits that could be achieved by judiciously entering into Repurchase Agreements to control their financing needs. With book-entry, the rapidity with which trades can be made and settled would provide the banks with a facility that will likely promote inter-bank Repo activity.

## C Technology

During the fact-gathering phase, the following additional information was obtained that, although not directly related to the task at hand, seemed significant:

The status of technology in Egypt seems to vary substantially. This is not too surprising since changes are taking place so rapidly. Some organizations are moving forward to a state-of-the-art status, while others are remaining relatively stagnant, mired in manual processes.

The Egyptian Banks for Technological Advancement is an organization that seems to be at the "state-of-the-art" stage. It was formed to develop a check clearing system that is now operational. The system includes 27 bank branches of 12 banks. Checks are MICR-encoded with the bank/branch numbers. The checks are scanned and the clearing information is prepared electronically. Listings are produced by computer and then hand-carried to the CBE, which posts debits and credits to the current account system.

The firm employs modular fault-tolerant computers, which process transactions concurrently on dual disk drives on the same computer and additional ones on a second computer. This provides a true "hot" backup.

This firm appears to have the communications infrastructure in place to handle inter-bank transactions, and the technical know-how to develop and install a funds transfer system (and possibly other systems)

They also appear to have been assigned the authority to maintain a standard bank identification number (see part III A 1 Bank Numbering) This probably emanated from the assignment of numbers that was needed for check processing

### III Analysis of Prerequisites for a Book-Entry System

It was considered important that several items be resolved, and that it would be helpful if they could be analyzed and resolved prior to developing the requirements for a book-entry system Accordingly, the findings and evaluations of those items are presented in this report, prior to the preparation of the requirements document

#### A Identification Methodology

Currently, many of the procedures at the Central Bank and at commercial banks involve manual processing The main reason for this is that T-Bills, T-Bonds, equities, and corporate bonds are all still in certificate or paper form Such items require that individuals read the pertinent, usually hand-written information and process it manually On the payment side, Egypt is very much a cash-oriented society Writing checks is just now beginning to take hold Electronic funds transfer does not exist

However, substantial progress is being made in many of these areas As mentioned, paper securities are being immobilized at MCS D so that changes of ownership can be recorded electronically and settlement will be more expeditious Checks are being MICR-encoded and scanned so that they can be cleared electronically

To accommodate computer processing of information, numbering systems have been introduced as the need arose The problem to date is that the numbering systems have been created for specific reasons As a result, that there is no standard numbering scheme (or system) being applied for the same or similar financial instruments, such as securities, or for the same or similar entities, such as banks

#### 1 Bank Numbering

The names of the banks and branches are sufficient identification on paper documents that are read by individuals and processed by individuals As automation takes place, numbering methods were developed by various organizations for various purposes The planned book-entry system will need a numbering system so that the computer can readily associate transactions and balances with the appropriate bank An identification number (code) will be needed to identify securities transactions and holdings (balances) and to identify the current account for payments

Fortunately, a standard bank numbering methodology is apparently being developed The initial need in Egypt was for the automation of check clearing and the need to identify banks and branches with the banks' current accounts at the CBE This enabled the cleared amounts to be credited and debited to the proper accounts Currently, the standard method being discussed appears to have the following format

XXXX - the first four digits representing the bank  
 XXXX - the second four digits representing the branch  
 \_\_\_X - a check digit to verify that no digit was transposed  
 Total of 9 digits

Current accounts only need four digits to identify a bank because the balances for the current account and securities account are kept at the bank level not at the branch level. Even though four digits would suffice, it seems preferable to use the standard 9-digit code (number) for identifying banks in the book-entry system, thus supporting a common bank code for all systems.

Importantly, it appears that a single organizational entity (Egyptian Banks for Technological Advancement, see Section II C) has been, or will be, assigned the responsibility for assigning, maintaining, and publishing the assigned bank identification numbers. This is the preferred approach.

## 2 Securities Numbering

Since inception, paper securities have been identified by the name of the issuer and other pertinent information regarding the security such as the maturity date and/or interest rate. As the need arose to automate certain aspects of securities processing, numbers have been assigned to facilitate internal processing by the organization that developed a particular automated system, e.g., MCSD for its securities processing.

Currently, an international standard has been established for identifying securities: the International Securities Identification Number (ISIN). This standard number requires 8 digits to identify the issuer of the security and the issuer's specific security issue. It also adds a ninth digit as a check digit, to verify that digits have not been transposed. In order to be used internationally, a three-digit prefix to this number was developed to identify the country of the issuer. Thus, ISIN requires a total of 12 digits to identify a security.

It seems preferable to abide by the international standard than to create another standard. The use of ISIN would provide a numbering system that could accommodate international trading should this need to be developed in the future.

In Egypt, no organization is currently assuming the responsibility of issuing, maintaining, and publishing the identification number for securities. The designation of a single responsible organization would assure uniformity in the methodology used and in the assignment of numbers. In the absence of such a designation, the book-entry system can proceed by having the CBE, the CMA, or the MOF assume the numbering responsibility for Treasury securities.

### **B Level of Accounting for Securities**

Currently, one level of accounting is used to maintain records of securities ownership. The beneficial owners' holdings, whether they are banks, corporations, or individuals, are recorded at the depositories—CBE or MCSD. Since all types of beneficial owners must be accommodated, a variety of methods of payment are permitted for the purchase of securities—check, cash, or debit/credit to accounts.

One of the objectives of the fact gathering and analysis was to determine whether a hierarchical method of accounting could be used for recording the beneficial owners of book-entry securities. Can the CBE maintain records of securities ownership at the bank level (the first level) and the banks maintain the records of ownership for their customers, generally individuals and corporations (the second level)?

Or would a major obstacle be created because of policy or overwhelming negative reactions from the major participants? The ability and willingness to handle this type of accounting was explored with all those who were encountered in the survey.

The feeling expressed was that some resistance will probably be encountered because of the transition from paper certificates to book-entry securities and because the records of ownership would be maintained at banks instead of at the Central Bank. However, having paperless securities and having securities ownership records maintained at banks requires a gradual gain in confidence. This is usually acquired when individuals start receiving interest and maturity payments from the banks at the expected interest or maturity date. Not surprisingly, the banks surveyed indicated that they had the ability and desire to accommodate this hierarchical method of accounting.

The conclusion reached was that the requirements could be developed using the hierarchical method of accounting for securities. This approach would enhance the ability to achieve delivery-versus-payment which reduces settlement risk.

### **C Methods of Payment**

The method of payment to be used for book-entry securities depends on the level of accounting to be used for book-entry securities. As indicated, currently, payments related to securities can be in cash, by check, or through debits and credits to money accounts. By using the hierarchical level of accounting for securities, the CBE need only concern itself with payments to and from banks which can be executed by credits and debits to banks' current accounts.

In order to choose the best method of payment for Egypt, it was necessary to evaluate several methods by which payments could be made. Can payment for securities be made electronically with the same transaction that records changes of securities ownership or must they be handled in a different manner?

Three alternative methods of handling the payments for securities were identified and evaluated:

- 1 One method is to develop a book-entry system that would be used solely to maintain records of securities ownership. Securities transactions would update the book-entry records and the system would not concern itself with the payments. Payments would be transacted between the buyer and seller and handled manually, outside the book-entry system, presumably prior to submitting the securities transactions.

This approach has worked in other countries. It achieves the benefits associated with replacing paper securities with computer records. It could be taken here as a first phase, if no other alternative is feasible at the time the book-entry system is operational.

- 2 Another method would be considered the ultimate delivery-versus-payment scenario. As part of the same transaction, the system would simultaneously record the debits and credits to securities accounts and the debits and credits to current accounts. In other words, the seller would receive a debit to its securities account for the securities sold and a credit to its current account for the payment amount. Concurrently, the buyer would receive the opposite. All updates would be executed simultaneously.

However, this alternative would require that the securities and accounting systems both be on-line, real-time systems, available for simultaneous processing. This would be very difficult to execute and unnecessarily complicated.

- 3 A third method is the most practical and meets the same goal of delivery-versus-payment as the previous alternative, although not with simultaneous updates. There are two variations of this method that take into account the capabilities that will probably exist with the CBE's current account system at the time the book-entry system becomes operational. Securities

transactions would update the securities accounts and create debit and credit records (accounting entries) for the payments portion of the securities transactions. At the end of securities processing, the system could either (a) produce listings of the payment transactions, and/or (b) generate tapes or disks of the accounting entries. Then either (a) the transaction information on the listings would be posted manually to the current account system or (b) the current account system would update the current accounts from the information received from the tape or disk.

Either of these variations would achieve the advantages of delivery-versus-payment during the same day although not technically 'simultaneously'. The book-entry system would create the accounting entries for the payments portion of the securities transactions at the same time it is updating the securities records but it would not be doing the accounting updates.

The lag until the end of day is not viewed as significant because payment updates and updates to securities ownership records would take place on the same day.

The third alternative is the clear choice here because it offers a delivery-versus-payment solution regardless of the status of the current account system, and it is attainable. If the CBE's current account (accounting) system meets its target date of year-end 1999, it would be able to receive the payment information from the book-entry system in electronic form, by disk or tape. If the book-entry system is operational and the accounting system is not, the payment information could be posted manually from listings produced by the book-entry system as a first phase. When the accounting system is ready, the book-entry system could readily be adjusted to create tape or disk. In either case, payments would be an integral part of the securities transaction.

A separate but related consideration is that there is no funds transfer system in existence in Egypt at this time and apparently there is none in the advanced planning stage. A funds transfer system would enable banks to rapidly transfer funds to one another electronically while providing the debits and credits to the CBE's current account system. This would greatly improve the payment capabilities in Egypt and would be an important adjunct to the book-entry system.

#### **IV Conclusion**

The gathering of information regarding the Egyptian securities market and its participants provides essential background and information that will help to determine the specific requirements for the book-entry system. A major conclusion drawn from the fact gathering and analysis is that things are changing rapidly in Egypt and in many different areas. In this regard gathering information as to the current status of markets and systems was very much like trying to hit a moving target.

The purpose of the requirements document (CBE 2.1.2) will be to establish a framework for the developers of the automated system by describing *what* the system will do. It should be noted, however, that nothing is set in concrete. The policies, opinions, and the needs of the securities market are dynamic and continually evolving.

Conversely, the book-entry system will have an effect on policy, the securities market, and the perception of government securities.

Therefore, the requirements, and later the system design, should be able to fulfill the needs of the current environment and estimate what will be in place at the time the book-entry system is implemented. Most importantly, the system should be flexible so that it can readily be adapted to accommodate the foreseen and unforeseen future needs.

## APPENDIX

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### Organizations and Individuals Contacted

Central Bank of Egypt	Mr Eweiss Advisor Mr Elshahawy Securities Department Mrs Torky Banks Control Department Managers and staff from various departments
Export Development Bank	Mr Negm Deputy Gen Manager
Alexandria Commercial Bank (Alexandria)	Mr Fefel Gen Manager
Commercial International Bank (Alexandria office)	Ms Ebeid Asst Gen Mgr Operations
National Bank of Egypt	Mr Fattah Gen Mgr Risk Mgmt Division Mr Eissa Deputy Gen Mgr Risk Mgmt Div
Citibank	Ms Hashim Vice President
EFG-Hermes (broker)	Mr Saba Managing Director Asset Mgmt Mr Asaal Securities Brokerage
MCS D	Mr Salaam Deputy Chairman & Managing Director
Egyptian Banks for Technological Advancement	Mr Magued Chairman and Managing Director