



Chemonics International, Inc.
1133 20th Street, NW
Washington, DC 20036
Telephone: (202) 955-3300
Fax: (202) 955-7540

AMIR Program
Access to Microfinance & Improved Implementation of Policy Reform

USAID Contract No. 278-C-00-98-0029-00

Building a Modern Securities Market in Jordan

Submitted to:
United States Agency for International Development

Submitted by:
Chemonics International Inc.

October 1999

Building a Modern Securities Market in Jordan

Table of Contents

<i>Overview and Summary</i>	<i>1</i>
<i>Implement Electronic Trading</i>	<i>5</i>
<i>Modernize the Trading Process</i>	<i>10</i>
<i>Establish Electronic Book-entry Settlement</i>	<i>17</i>
<i>Develop a Share Registry and Accounting System</i>	<i>33</i>
<i>Establish a Settlement Guarantee Fund</i>	<i>36</i>
<i>Establish an efficient Surveillance and Regulatory System</i>	<i>38</i>
<i>Use the Internet to Develop the Market Internationally</i>	<i>41</i>
<i>Develop an Expanded Automation Program</i>	<i>43</i>

Building a Modern Securities Market in Jordan

Ideas for Today and Tomorrow

Overview and Summary

Introduction

Jordan's securities market must be modernized if it is to attract significant numbers of serious investors. Trading and settlement automation is the key. The Jordan Securities Commission (JSC), the Amman Stock Exchange (ASE) and the Securities Depository Center (SDC), along with USAID and the Government of Jordan, are all striving to establish a world class securities market in Jordan. This report is based on that premise. It outlines a set of tasks and recommendations on modernizing Jordan's securities market through Information Technology (IT).

Current Status

Under contract to the Amman Financial Market, SBF (the Paris Bourse) has installed its Electronic Trading System (ETS) software and SICOVAM (the French Depository) has installed an electronic book-entry settlement system (SEMS or Stock Exchange Management System). These systems are patterned after those in successful use in France. For a variety of reasons, these systems are not yet operational. These systems are being analyzed and tested to determine their efficacy in the Jordanian environment and to determine whether they should be replaced or modified. Regardless of whether this software is used or replaced, certain tasks must be completed before automated trading and settlement can be implemented. Our recommendations are phrased from this perspective.

ASE and SDC have moved into new office facilities in the Hamzeh Building. A telephone switch (PABX) has been installed and is being tested. A computer room has been constructed and an Uninterruptible Power Supply (UPS) installed. The PABX and UPS are being provided under a USAID grant. A Trading Floor has been outfitted with approximately 48 powerful Pentium-based PC Trader Workstations. A temporary LAN (Local Area Network) has been installed to enable testing of the trading system. The trading and depository system server computers have been installed. The trading system computer has been temporarily located in the Visitor's Gallery while awaiting installation of a permanent LAN.

A vendor to install a fiber optic network linking the Housing Bank Building with the Hamzeh Building is being acquired under a USAID grant. It will link the brokers and the JSC in the Housing Bank Building with the trading and depository systems. Installation of that network is expected to occur during the next three months.

Some bugs have been found in the ETS trading system. Correction of these bugs is being arranged with SBF. In addition, discussions are underway with SBF regarding customization that is needed to better match Jordanian market requirements. A new version of the trading system has been received. The British firm Capital Markets Partners Ltd. has developed a test and implementation plan and will be assisting the ASE in testing the system under a grant by the British Government. The tests are designed to demonstrate conclusively the efficacy of

the trading system and whether it meets ASE's needs. The latest developments appear encouraging. Based on CMP's test plan, the go-live date is March 2000.

The depository system appears more problematic however. That system is patterned after French settlement practices. There are fundamental differences between clearing and settlement practices in France and those in Jordan. In France, securities are dematerialized and reside totally in the depository while, in Jordan, certificates are used. The second difference is that, in France ownership records are maintained by "Account Managers" (i.e. brokers and custodians) while, in Jordan the Securities Law requires (our interpretation) the Depository to maintain the Register of ownership of securities traded on the ASE.

In France, Account Managers are well capitalized and have sophisticated systems for maintaining custody over investor holdings. In addition, France has extensive experience and comprehensive laws and regulations on custody and on registration. It also has well funded Settlement Guarantee and Investor Protection mechanisms.

We believe that adding the needed functionality to SEMS to accommodate Jordan's requirements would be quite difficult. We believe the depository system is ill suited for use in Jordan, rather akin to forcing a square peg in a round hole. We recommend that replacing it with one better suited to local needs. USAID is prepared to provide such a system and install it on SDC's computers.

What is Needed

If they are to be used, both ETS and SEMS must be modified to meet the requirements of the Jordanian Market.

We recommend adding the following functionality to ETS prior to implementation:

- Inclusion of Client Reference number or broker order number in the trade confirmation sent to the broker and in the record passed to the settlement system.
- A full set of such reports as are normally associated with automated trading systems.
- Confirmation of all trades, cancellations and other transactions to the brokers at end of day. These should be electronically accessible to the brokers.
- Real-time, on line trade report printing.
- Remote support for broker display (in their offices) of full market data.
- Support for remote trading by brokers. It appears that remote trading may require use of a 64 kbps communications line to be effective. This seems to be an extraordinary requirement. The cost of providing this service should be researched.
- Execution of crossed-trades within ASE's price, time priority rule.

We also suggest that the ASE ask the SBF for a copy of the trading system's program source code on a "for use only by ASE" basis. This would enable the ASE to maintain and customize the system as it sees fit. If the source code cannot be provided at no cost or very low cost, we suggest that the source code be placed in escrow in Jordan, so that it would be available in the event that SBF cease to provide needed support.

We believe that additional functionality must be added to the depository system in order to make it usable in Jordan and compliant with Jordanian law. These include:

- A system for handling the deposit and withdrawal of certificates.

- A full set of those reports normally associated with clearing and settlement.
- A registry system capable of handling corporate actions.

Goals and Objectives

We are assuming that a World-Class system is wanted. Indeed, we would support nothing less. From a selfish perspective, we believe that there is no point in developing the market unless it is something that everyone, including Americans can invest in. Basically we would not want to close out investment by building an inadequate system.

American Pension Funds (and other investors constrained by law or preference) are prohibited from investing in markets that do not have a properly functioning Depository. In markets that lack a proper depository investors associate an investment premium to their investments in order to address settlement risk.

- The market should be fair, orderly, cost-effective and accurate. It should be visible worldwide. Trading should be absolutely transparent. We also believe that the market should be modern and well regulated.

Build a World-Class Securities Market

Implementing automated trading and electronic (i.e. book entry) settlement is more than just installing computer software. A wide area network is needed to provide market information to brokers in their offices and to investors. Broker front-office and back-office systems must be developed as well. Rules must be developed and agreed upon. Procedures must be written and staff trained. Contingency plans should be developed.

This document concentrates its recommendations on Information Technology (IT) issues. A summary of our recommendations is as follows:

1. Implement Electronic Trading (ETS or other)
 - a. Determine the efficacy and suitability of ETS
 - b. Correct ETS workstation display errors and other bugs
 - c. Develop missing trading system reports
 - d. Provide Real-time Trade Confirmations with client order identification
 - e. Include client order identification in record passed to settlement
 - f. Develop Risk Management tools for the exchange
 - g. Agree on Trading rules
 - h. Expand ASE's Surveillance capabilities
 - i. Acquire /Build a Broker Front Office system
 - j. Service the Investors who now congregate on the floor
 - k. Service other retail investors
 - l. Service the Institutional Investor
 - m. Test and Implement the system
2. Modernize the Trading Process
 - a. Revamp the Trading Floor
 - b. Enable Remote trading for those brokers who desire it
 - c. Link the Hamzeh and Housing Bank Buildings with a Fiber Network
 - d. Build a Network to carry traffic to all participants
 - e. Develop a Market Data Dissemination System
 - i. Deliver real-time market information to ASE member offices
 - ii. Provide brokers with tools for utilizing the market information broadcast

- iii. Deliver real-time market information to data vendors, et al
- iv. Provide a for-fee real-time information broadcast via the internet
- v. Give brokers the means to customize their systems
- vi. Provide market information in Arabic (for items i through v above)
- f. Implement enhanced Security
- g. Automate Software upgrading and Maintenance
- h. Escrow The system's Source Code
- i. Protect Archive and History Files
- j. Develop a Disaster Recovery Plan
- k. Conduct staff and User Training
- 3. Implement electronic book-entry settlement (SEMS or other)
 - a. Settle all trades of depository eligible securities electronically
 - b. Follow the Group of Thirty Recommendations
 - c. Develop a system for depositing Certificates
 - d. Develop a system for withdrawal of certificates from the depository
 - e. Establish Participant Interfaces and enable remote access
 - f. Develop links to the Settlement Bank
 - g. Establish a lost, stolen and counterfeit Securities database
 - h. Develop a full set of settlement reports
 - i. Develop tools for synchronizing trade and settlement records with member records
 - j. Develop Risk Management tools for the depository
 - k. Enable remote access to the depository system
 - l. Acquire /Build a Broker Back-office system
 - m. Dematerialize Depository Holdings
 - n. Migrate Shareholdings into the Depository
 - i. Make selected securities depository eligible
 - ii. Audit the existing share Registers for the selected securities
 - iii. Transfer Registers to the SDC's automated Register
 - o. Establish an ISIN numbering system
 - p. Implement enhanced security
 - i. Provide tiered access to the system
 - ii. Establish Firewalls and other system security measures
 - q. Develop a Disaster Recovery Program
 - r. Conduct User and Staff Training
 - s. Promote the Depository
- 4. Develop a Share Registration and Accounting System
 - a. Link the Share Registration and Accounting System to settlement
- 5. Establish a Settlement Guarantee Fund
- 6. Establish an efficient Surveillance and Regulatory System
- 7. Develop linked Web Sites for the ASE, the SDC and the JSC
 - a. Advertise the Jordanian securities market globally
 - b. Disseminate end-of-day price, quote and other market information via the Internet
 - c. Distribute public information (e.g. trading and settlement rules, company reports, member names, addresses and other information, research, etc.)
 - d. Provide e-mail to market intermediaries
 - e. Provide efficient Internet access for market research
- 8. Develop an Expanded Automation Program.

Implement Electronic Trading

Trading system component

This component consists of one or more exchanges or trading systems that bring together buyers and sellers of securities, either directly or through market intermediaries. Price quotation, order execution and trade reporting are included within this component.

Jordan's population and economic circumstances are such that only one market for corporate securities is likely to be sustainable. Accordingly, the JSC is directing its efforts toward the development of one optimal market structure. An order driven automated trading system is being implemented.

Current Status

Under contract to the Amman Financial Market, SBF (Paris Bourse) and has installed an Electronic Trading System (ETS). Implementation of that system has been delayed for a number of reasons. Recently however needed facilities have been installed and efforts are underway to test the system.

A number of system deficiencies have been uncovered. Certain of these deficiencies must be corrected before automated trading can be implemented. We also believe that certain enhancements must be made to ensure efficient market operations. To summarize, we note the following deficiencies:

- ETS does not produce needed printed reports
- The Stock Watch System does not accurately reflect the market
- The system does not produce any printed trade Confirmations
- Trade reports do not show client ID
- ETS' market surveillance capabilities are very limited and unsophisticated
- The system does not provide any on-line "Alerts" of unusual activity or prices
- High speed communications lines (64 kbps) are needed to support remote trading
- ADE does not have a license to use the workstation software in member offices
- ASE does not have the source code for ETS

The current status is encouraging however. SBF have promised ASE that they will correct the errors identified to them. We understand that about half of the previously identified problems have been corrected. It now seems likely that the system can be implemented on schedule (currently targeted for March 2000). Our major concern, at this point, is ETS' requirement for 64 kbps communications lines to support remote trading. The basic problem with this requirement is one of availability and cost.

Determine ETS efficacy and suitability

The testing process recommended by CMP should uncover any deficiencies in ETS. It should conclusively demonstrate the efficacy (or lack thereof) of ETS in the Jordanian market. SBF have promised to correct any problems that are uncovered during testing.

Correct ETS workstation display errors and other bugs

We have been advised that the bulk of the workstation errors have been corrected.

Develop missing trading system reports

The original ETS system lacks some essential reports. We understand that SBF has developed some reports at the request of the ASE. It may be possible for the ASE to develop most or all of its needed reports by using the text files that are produced by the trading system at end-of-day. We suggest that the ASE develop a complete list of reports that it requires. It should poll the brokers to determine their needs. The more obvious requirements are:

- Individual Trade contracts
- List of executed trades
- List of Cancelled orders
- List of orders that expired this session

For stock exchange purposes, these reports should include all transactions processed by the system. We further suggest that a complete transaction list be written to non-erasable media such as a WORM (Write Once Read Mostly) optical disk. This list should be written in audit trail format and should include date, time and sufficient detail as to enable its use in replaying the market.

We recommend that broker reports be made available electronically rather than in printed form. When a firm needed its reports, it would sign on to the system and request that its reports be downloaded to their remote workstation. Only if a member's system were not functioning would the exchange print reports for that member.

Provide Real-time Trade Confirmations with client order identification

At present the only real-time trade report is a screen message. We suggest that a trade "Confirmation" be printed at the broker's Home Office immediately following execution. The Confirmation should include the Client Reference number or Broker Order number. This will enable the broker to identify the client for whom the order was executed. It would enable the broker to advise the client of the status of his or her order immediately after it was executed. This improved service will undoubtedly enable the brokers to deliver better and more efficient service, thereby attracting a higher volume of business.

Include client order identification in record passed to settlement

ETS treats the 16-character client code in each order as so confidential that it makes it available to the submitting broker only on certain limited screen displays. The purpose of that code is to enable brokers to identify the original client order against which a trade was executed. This code is not included in the trade record in the 'Archive' file that is passed to settlement. As a result, the broker's back office will not be able to use this information to identify the client for whom an order was executed. This task must therefore be performed manually.

Proper identification of an order's originator is crucial to efficient processing by the exchange, the depository and the broker. Trading volume will increase with the advent of automated trading. It is simply too difficult for brokers to manage their trades without this information. ETS provides only a clumsy copy/paste mechanism for recording client identification. Furthermore this forces brokers to manually reenter this data for settlement. We therefore strongly recommend that ETS be modified to include the client reference number (or broker order number) in the data passed to settlement.

Develop Risk Management tools for the exchange

For exchange-traded instruments, counterparty credit exposure will probably be assumed by the SDC and managed through netting and margin arrangements. These arrangements will be designed to limit the spread of credit and liquidity problems if individual firms or customers have difficulty meeting their obligations. The SDC will however require data (e.g. prices for marking-to-the-market purposes) and other assistance from the exchange in managing risk. Exchange and depository participants will be required to maintain certain minimum capital levels. They may also be required to post collateral in instances where trading exceeds certain levels. It may be necessary for the exchange to limit a firm's trading to a certain fixed multiple of the firm's Net Capital. The exchange will therefore need to work with the depository in developing effective risk management procedures. In the interim, prior to implementation of the depository, the exchange will probably rely on trade-for-trade settlement to minimize settlement risks.

Agree on Trading Rules

The ASE has started the process of agreeing on Trading Rules. These, of course, will need to be implemented where appropriate in the software.

Expand ASE's Surveillance Facilities

ETS' surveillance capabilities are very limited. It can restrict trade price ranges and alert staff when a security's price would exceed a specified percentage. The module "SPI" seems to be a market management tool and not a Market Watch system. The system cannot be used to detect unusual price or volume behavior or other anomalous trading activity except through laborious manual monitoring. This effectively limits ASE's ability to monitor the market.

If a more robust market monitoring system is not available with ETS, we suggest that ASE consider building or acquiring such a system. The system should be able to replay the market using existing files. It should have a historical analysis capability.

Acquire /Build a Broker "Front Office" System

Brokerage firms need a front office system for managing orders and for interfacing with the exchange. These systems should provide some measure of assistance in portfolio management and other customer activities. ASE members need a way to display real-time market information in their offices. They also would like to have the ability to trade remotely (i.e. enter orders and execute trades from their offices). The ETS workstation software GL Win can perform both of these functions. There are two problems with using the GL Win software to perform these functions however. First, the ASE does not have a license to use that software anywhere except on the trading floor. Secondly, the ETS workstation software is designed for use by traders while what is needed is a system aimed at supporting brokerage Front Office operations.

This software should provide full support for the front office. It should have facilities for maintaining client information including names, address, holdings, interests, etc. It should be able to manage and price portfolios, graph market movements, generate alerts, etc.

We recommend that the ASE request a license to use the GL Win workstation software from the ASE member offices without charge. If SBF is unwilling or unable (the software belongs to a subsidiary company) to provide a free license to use that software for remote trading, perhaps it would be willing to provide the display software at no charge. This software

license may be needed for only a short period of time if the ASE is able to develop its own remote workstation software.

The interface between the ETS trading engine (located on the server computer) and the workstation is clearly defined. We suggest that the ASE develop customized systems using that interface. There are a number of specialized needs in the typical brokerage office. Some brokers cater to Institutional Investors while other have a more retail oriented clientele. These clients have different needs and expectations.

Service those who now congregate on the Trading Floor

A number of investors currently congregate on the trading floor every day. These investors will have no place to go, once the current trading floor is abandoned. Plans should be developed to service those brokers. Unfortunately most broker offices are too small to accommodate more than a few clients at a time. We are, of course, recommending that ASE's brokers be provided the tools they need to establish their own customer galleries. However, this will take time and money. We believe that most brokerage firms will not be able to establish customer support facilities until well after the start of automated trading. Thus a need exists for a customer viewing and trading gallery.

Perhaps the existing floor could be used as a temporary customer gallery, at least until such time as the brokers can develop their own facilities. The main problem in doing this is effecting the switch from a manual floor to a customer room. A lot of equipment (e.g. video displays, data walls, computers, telephones, etc.) will need to be on the trading floor while it is still in active use.

One approach might be to mount data wall displays between the ceiling and the top of the existing chalkboards. A data wall is a panel of lights that is used to display information. These are often seen in train stations and airports, and of course, stock exchange trading floors. If sufficient space exists to accommodate these units, it may be possible to install and test them without disturbing ongoing trading. At a minimum, the data wall should display the name of the security, the current bid price and volume, the current ask price and volume and the most recent trade price and volume. These are expensive units but extremely useful in displaying current market prices and conditions.

It will also be necessary to install banks of telephones on the existing trading floor that are connected to the phones on the new trading floor. These phones should be so-called punch-down lines. Basically these are telephones that are directly linked to each other (this can be done using the fiber optic link that is planned between the Housing Bank and Hamzeh Buildings). Picking up the handset on one telephone causes the telephone at the other end to ring. This eliminates any delays that can occur with manual dialing.

We also suggest that the floor be outfitted with large television monitors. The main purpose would be to provide those on the floor with the ability to watch the news.

Making a change of this sort will require a great deal of very careful planning. It will also require the brokers who use this facility to man two floors. Nonetheless, this approach deserves consideration, as it may be the best way (perhaps only way) to service the investors who currently operate from the existing trading floor.

Service other Retail Investors

Retail clients appreciate brokers who can provide them with real time market information. They also expect their brokers to have information on their respective holdings at their

fingertips. Many brokers want to monitor their clients' portfolios and to alert clients whenever market conditions might affect their holdings. Delivering this level of service will help the brokers increase their transaction volumes and income.

Automation is the key. We are unaware of the level of automation currently used by ASE members. It is probable however that none of the firms has a system that combines customer data and market data in comprehensive ways. We therefore suggest that the ASE either purchase or develop a basic front office package for its members. The package should be easily modified /customized. It should track customers and their portfolios. It should manage the firms open order file. It should be linked as closely as practical to the automated trading system. It should support the member firm's sales efforts.

Ultimately commercial software firms may develop comprehensive broker software, which would negate the need for the ASE to provide this software. In the interim however, a basic Front Office software system may prove extremely useful.

Service the Institutional Investor

Institutional Investors (IIs) use the telephone and facsimile machine as their primary means of communications. They need price information in their own offices. Market data vendors such as Reuters or Bloomberg usually provide this information. IIs want rapid response, efficient low cost trading and efficient, low risk settlement from their brokers.

IIs tend to trade in large amounts. They generally prefer that their trading be anonymous. Most brokers have special trading desks and software systems to support this business segment. They need the ability to provide research to those clients who desire it. They need the ability to call up the client's entire trading history with just a very few keystrokes. The system should also immediately display any open orders or work in progress.

Test and Implement the trading system

CMP have drafted a Test Plan to accomplish this objective.

Conduct Training

CMP's Test Plan makes provision for training brokers and ASE staff to operate the automated trading system. Automated trading will clearly change the way in which brokers conduct their business. It will change the way in which they service their clients. It will enable them to deliver services that are not possible with the present manual trading system. We suggest therefore, that it may useful to take some key brokers on a tour of recently automated exchanges. By meeting with brokers who have experienced these changes, ASE's brokers may gain a better understanding of what to expect with automated trading than would be the case with other types of training.

We recommend that intensive training for trainers be conducted. The intent is to develop a cadre of personnel fully capable of conducting on-going training of staff and users. We would train the IT staff in maintenance and modification of the system.

Modernize the Trading Process

Revamp the Trading Floor

The proposed Trading Floor is more reminiscent of a Language Laboratory than a Trading Floor. It is too crowded and is not conducive to effective communication between traders and brokers. The desks are too high to enable visual communications (*See Figure 1*). We suggest that the floor be revamped. We suggest replacing the desks with purpose built trading desks similar to those in use in large trading rooms. If that is not feasible, we suggest removing around half of the desks and stationing the remainder around the perimeter of the room. This would enable brokers on the floor to see one another and to better communicate with each other. It would also make the tickers and other shared data displays more useful and more visible.



Figure 1. Amman Stock Exchange new Floor

A lot of equipment will be installed in each booth including a telephone, a facsimile machine and a computer workstation with a large 19" screen, a keyboard, a mouse and a printer. A trader's desk space is the most valuable space available to them. We suggest that the trading desk's surface hold only that equipment needed at the broker's fingertips. This would include the keyboard, mouse, video display and telephone.

All other equipment such as the workstation computer, the printer and the facsimile machine should be placed under the desk surface or otherwise out of the way. We suggest mounting the workstation computer on a pedestal under the trading desk. This will keep it out of the way while at the same time help avoid damage from floor cleaning equipment.

We understand that the exchange plans on using laser printers in the booths. We suggest that a laser printer may not be the best sort of printer for the floor. A small ticket printer may be more useful, especially if the major purpose is to print trade confirmations. If the major

purpose is to print lists and screen displays, a small dot matrix printer may be more suitable. It may be that very little printing will occur on the floor. This will certainly be the case if the brokers are given the ability to download their transactions to their office computers.

The exchange also plans on installing facsimile machines in each broker's booth. We ask how will these fax machines be used? If the only sender is the individual broker's home office, it might be simpler and less expensive to install a small ticket printer in the booth and connect it to the home office computer via a dedicated telephone line.

The number of telephone lines each broker will need must be determined. Some may need only one or two, while other may need several. Much depends on how the floor is to be manned by the brokers and how many different parties might call the floor broker. For example will the floor broker be speaking only to the firm's home office? If that is the case the floor broker may need only two lines, one punch-down line and one ordinary telephone line. Firms with multiple offices may want a link to each office plus one or two extra lines. The type of telephone instrument and type of lines (e.g. punch-down, direct lines, common numbers linked by the PABX switch, etc.) must also be determined. The exchange plans on recording all trader conversations so as to forestall possible conflicts and to research error trades. This equipment must be defined. The first step however, is to poll the brokers regarding their requirements.

Enable Remote Trading for those Brokers who desire it

With automated trading, a floor is not needed. In general, brokers prefer being where they can meet their clients rather than on the floor. Brokers can enter orders and execute trades from their offices just as easily as they can from the Trading Floor, perhaps even easier. Indeed, they would need fewer personnel to trade from their offices. The only thing required to accomplish this is a network linking the brokers to the trading system. A network is required to deliver market information to each brokers office(s). That same network could be used to enable remote trading. It would be simpler, less expensive and more modern to enable the brokers to trade using workstations in their offices. We therefore recommend that remote trading facilities be provided for those brokers who desire that capability.

Trading floors are obsolete except for very specialized purposes such as negotiating very large trades such as is done on the New York Stock Exchange floor. Please note that, even at the NYSE, computers execute well over 80% of all trades, and all trades of 5,000 shares or less. We believe that the Amman Stock Exchange will probably abandon its trading floor within two years of the launch of automated trading.

Link the Housing Bank and Hamzeh Buildings

Brokers must have real-time trading information in their offices in order to service their customers. They must also be able to communicate with the trading floor and/or the trading system server computers. For brokers located in the Housing Bank Building, this requirement will be satisfied by the planned installation of a fiber optic communications line linking the Housing Bank and Hamzeh Buildings. This link must be installed and operational before the start of automated trading. This includes the following tasks:

- a. Install a Fiber Optic communications line between the two buildings
- b. Install a Local Area Network (LAN) on the trading floor
- c. Connect the LAN to the trading system computers
- d. Install a LAN in the Housing Bank Building

- e. Connect at least one workstation in each ASE member office in the Housing Bank Building to the LAN
- f. Provide trading system access to each of those workstations (some brokers may have information only access while others may have trading system access)
- g. Connect the JSC to the LAN
- h. Provide trading system access (information only) to the JSC
- i. Implement enhanced security

The above list includes only those tasks that must be completed before the automated trading system can be implemented. This network can be used to carry other traffic. For example, it can be used to provide access to the settlement system. It can be used to provide an e-mail system between participating brokers. It can carry voice traffic between the two buildings.

Build a Network to service all Market Participants

We believe that all brokers, not just those located in the Housing Bank Building, *must* have dedicated access to the trading system before automated trading can begin. This requires construction of a network. Initially the network can be limited to the Amman metropolitan area. In the future, countrywide expansion should be provided.

Automated trading systems have two basic communications requirements. A high volume countrywide broadcast mechanism is needed to disseminate market information on a real-time basis. A moderate volume reliable communications medium is needed to enter orders and receive trade reports (i.e. to trade). These services should be continuously available, be very reliable and have full easily accessed back-up. We are recommending that the ASE create a Wide Area Network (WAN) to handle this traffic. This would be done in stages with the first stage servicing the brokers who do not have facilities in the Housing Bank Building.

NOTE: We have been told that the ETS system requires a minimum communications bandwidth of 64 kbps between the central server computer and the remote workstation to support remote trading. This seems an extraordinary requirement. The Shanghai Stock Exchange and the Russian Trading System (both of which execute very large numbers of trades over a very wide geographic area) need only 9.6 kbps to support remote trading. We have asked the ASE to verify with SBF the minimum and optimal bandwidth requirements needed to support remote trading. We have also asked that the availability and cost of 64 kbps service in Jordan be investigated.

There are several alternatives for establishing the trading system network. These include leased telephone lines, ISDN (Integrated Services Digital Network – a high capacity network service offered by the Jordanian telephone company, cellular telephony, two-way radio transmission, the Internet and two-way VSAT (satellite communications using Very Small Aperture Terminals (small, around 90 cm parabolic antennae)).

It is also possible to disseminate market information by piggybacking it on an existing television signal. This would provide countrywide broadcasting of market data at very low cost with no effect on the television programs being broadcast. It would allow small brokers to trade from their offices at low cost. They would receive market data via the television signal and enter their orders and receive their trade reports over dial-up telephone lines.

As previously noted, we recommend immediate construction of a Metropolitan Area Network covering Amman. We have started a project under USAID auspices to define this network.

Develop a Market Data Dissemination System

Deliver Real-time Market Data to ASE member Offices

Most brokers now get their market information from Reuters and Access. These services contain only reported trades. This information is in no special sequence and cannot be used to determine market direction or to spot trends. It does not include bids or offers as these data are reported only on the “Whiteboards” on the trading floor.

With the advent of automated trading, ASE members will be able to get this information directly without the intervention of an intermediary data vendor. It should be delivered to each ASE member’s office. Brokers in the Housing Bank Building would be served by the building to building network. All other brokers would be served by the exchange’s metropolitan area network. Two primary data types will be collected and disseminated via the exchange’s market data broadcast system:

System Generated: This is real-time market information generated by or through the trading system. It includes bid prices and volumes, offer prices and volume, last sale (i.e. most recent transaction) prices and volume. We are unfamiliar with the details of the data broadcast produced by the ETS system. We suggest that it should include administrative notices and market statistics, such as Price Earnings Ratio (PER), Price to Book Value (PBV), etc. Trade reports and related statistics should be taken from the system at the end of each trading day and faxed or electronically transmitted to local newspaper offices and other interested parties.

Externally Provided: This includes such data as special exchange news bulletins and corporate announcements. ASE will collect from its listed companies, regular corporate and financial reports. This should include dividend announcements, notices of rights offerings, news releases, etc. We suggest that the exchange ask the companies to file this information in electronic form.

We recommend that this information be placed on the exchange’s Internet Web site as soon as it becomes available. We also suggest that the arrival of this information be announced over the exchange’s market data broadcast. This could be done in two ways. A headline announcement would be broadcast. In addition, special flags could be added to each message broadcast about an affected security. For example the letter “D” would be inserted in each bid /offer and last sale message of any security for which a dividend had been declared. Other symbols would indicate other information. An “N” might indicate News, a “A” might indicate an Annual Report had been issued and a “T” might indicate a Tender offer had been made, etc.

During an initial period, say one day or one week, all announcements could be transmitted periodically, for example once an hour. Persons viewing the “Dividend” headline on their ticker display or the “D” in their market price displays would know that a dividend had been declared and that details were available on the exchange’s database and its Web site.

All electronic trading systems have some level of Market Data Dissemination capabilities. We recommend that the exchange make extensive use this facility to deliver a very high level of service to its members and to the investment community. If ASE’s proposed trading system does not provide all of the aforementioned data, we recommend that it be added.

Give ASE members tools to use the market data broadcast

ASE members will want to use the data broadcast to service their clientele and to improve their business. They will want to create video displays, wallboard displays, market monitors,

graphical displays, ticker displays, etc. We suggest that the ASE acquire or create software to perform these tasks. At a minimum, the programs should receive the data, store it in a local database and use it to dynamically update all displays that are in use.

Make the tools readily customizable

ASE's members will want to use the market information in many different ways. We suggest that the exchange provide those members that request it, the source code for the "receive and display market information" software. That software should be carefully constructed.

Members will not want to, nor should they need to, change the core software. What they will require is an ability to take the received data and use it in imaginative ways.

Deliver Real-time Market Information to Data Vendors

Currently, the ASE delivers a trade information broadcast to Reuters and Access (a Jordanian market data vendor). These firms and others will want to receive the Real-time market information broadcast. We suggest that this information costs the exchange money to generate and has a certain value. We therefore suggest that the exchange charge (perhaps an annual fee) subscribers to the real-time feed a fee for receiving that feed. We suggest that end-of-day data be provided at no charge.

The exchange will want its information published in the financial sections of Jordan's daily newspapers and other publications. It will also welcome international coverage. As time goes on, more and more periodicals will want to publish this information as a service to their readers. We recommend that the ASE develop a mechanism for delivering end-of-day market information to the news media and other subscribers that may want it. For the daily news publications with deadline pressures, we suggest that the exchange provide a daily data "download" service whereby the information is sent via dial telephone service to these media subscribers. It may even be useful if the exchange put its information in the precise format in which it would be printed. The exchange could use its Internet Web site as a tool for providing other subscribers with these data. This information should be provided in both Arabic and English.

Deliver Arabic Market Information Displays

The software that manages the market data displays should have the capability of displaying information in both Arabic and English. The display language should be selectable on request via a simple "Hot key" (keystroke combination). This is not as difficult as might first appear. The number of words used in the displays is really quite small. It consists of the names of each company plus a small handful of miscellaneous words such as bid, ask, open, high, low, last, etc. Each display would have an Arabic and an English version. Pressing the Hot Key would determine the version used to create the display(s).

Provide a for-fee Real-time Market Data via the Internet

The exchange will be providing market information to data vendors for a fee. These vendors offer both national and international coverage for the Jordanian market. The exchange may, however, wish to provide a limited real-time low-cost broadcast aimed at individual investors. This can be done by publishing over the Internet using Push Technology.

Implement Security System

Security is an important issue in implementing automated trading. It is assumed that the system could operate in untrusted telecommunication environment like Internet. There are

different levels of security required in the system – for example a quote update request is more sensitive information than a quote replication message.

We recommend that ASE establish a robust user authorization mechanism. The details can be found in the technical literature, but it is worth noting some basic principles:

- user passwords should never be transmitted via the network in any form
- a session key should be obtained when the workstation connects to the system and should be valid only for the current session
- requests sent to the trading system should be encrypted by the session key and decrypted only at the trading system with no intermediate decoding or storage – it should be impossible to sniff the request on its way from the workstation to trading system
- request and replication messages should be encrypted differently
- all messages in the stream should be interdependent, there should be no way to cut out a user message from the stream and drop it or insert sometime later
- all user passwords should be stored on the server computer in encrypted form
- operator, supervisor and system administrator levels and options should be clearly defined in the system.
- The system should differentiate between different classes of users.
- the application software should have hierarchical access control capabilities plus authorization functions for data modifications.

We recommend that data compression should be used in conjunction with encryption. This would result in a considerable reduction of traffic, perhaps as much as a five-fold reduction.

ASE and SDC should ensure that their computer networks have sufficient operational integrity (security, reliability, capacity, backup systems and alternative means of communication) and that they have adequate personnel to handle Internet communications, including trading instructions.

Software upgrade and maintenance

In the future, ASE will want to install trader workstations and market data displays all over Jordan as well as abroad. When that occurs, efficient software upgrade and maintenance will become crucial to system success. We recommend that system software be installed that would enable the remote upgrading of workstation software. The upgrade process should be transparent to the user. New versions would be replicated to the user workstation during the session. After replication has been completed, the modules could be changed at the beginning of a new session or immediately, as set up by the administrator.

This solution will enable a reduction in the number of field engineers and considerably reduce the time period between the introduction of new versions of the software.

We recommend that a copy of each version of software being placed in production be archived to non-erasable media such as optical disk. This would enable restoration of earlier versions of a software module should the new version develop unforeseen problems. It would also enable the recreation of a particular trading session using the precise software originally used to execute that session.

Escrow Source Code

ASE does not have a copy of the ETS source code. If ASE implements ETS, we recommend that ASE insist on the source code being placed in escrow with a mutually agreed custodian bank in Jordan. The escrow agreement should have clear rules under which the ASE would have access to the code. In addition, each new version of the source code should be stored under the escrow agreement. The reason is simple. We are concerned about ASE's ability to maintain the ETS software if the SBF decided to exit the support business or if unforeseen events were to prevent it from providing the support needed.

Protect Archival Files

All history and archive files should be recorded on non-erasable media such as optical disk. The trading system software version that generated these files should be recorded on the files themselves. This gathering of data should be performed every single trading day. At least one copy of these files should be stored off-site in a fire-proof vault.

Develop a Disaster Recovery Plan

ASE should develop a Disaster Recovery Plan as soon as practical. The plan should provide all market participants with an understanding of what to do should a disaster strike.

Train Users

Considerable time has elapsed since ASE staff and brokers were trained in the use of the ETS. They need additional training to fully grasp the structure and control of the trading system, both from a technical side and a user perspective. We are therefore recommending complete retraining of all users and staff. The objective is to enable a maximum level of self-sufficiency. We believe that two months of system and user training before launching the system is required. We also recommend that special attention be placed on developing a strong local IT support capability.

Establish Electronic Book-entry Settlement

Background

A Securities Depository Center has been established under Jordanian Law. Its objectives are:

1. to simplify the process of transferring ownership of securities;
2. to increase public confidence in the securities market;
3. to raise the Jordanian market to the standards of international capital markets;
4. to increase marketplace liquidity.

We interpret the law as requiring the SDC to maintain a register of ownership of securities traded on the ASE. We base our interpretation on Articles 29, 30 and 76, portions of which are shown below (from an unofficial translation):

Article (29)

- a) A center to be called the Securities Deposit Center shall be established in the Kingdom for the deposit and transfer of ownership of securities traded on the Securities Exchange and settlement of the prices of such securities among financial brokers. It shall be the only agency authorized to carry out such activities in the Kingdom.
- b) The Center's aim shall be the safekeeping of ownership of securities listed on the Securities Exchange.

Article (30)

- a) Registration and transfer of ownership of securities traded on the Securities Exchange and the settlement of trades of such securities among financial brokers shall be made by entries in the Centers records.

Article (76)

All issuers of listed securities shall deliver registers of owners of securities issued by them and any data related to these registers and owners of securities entered in them to the Center or to holders of accounts with the Center, in accordance with instructions issued by the Board of Commissioners in this respect.

SDC's Needs

To achieve its goals, SDC needs software to automate the clearance and settlement of the trades executed on the ASE. It also needs Share Registration software.

SDC has acquired depository system software (SEMS or Stock Exchange Management System) from the French Depository SICOVAM. Unfortunately, SEMS does not meet certain crucial requirements of the Jordanian market. Apparently, SEMS functions well in other countries. However, it was built for a dematerialized environment. Therefore it does not handle certificates. It does not handle certificate deposits or withdrawals. In Jordan, millions of stock certificates are in circulation. SDC's computer system must track these deposits.

As mentioned previously, Jordan's Securities Law makes SDC responsible for registration of Beneficial Owner details. SEMS does not handle share registration. Under SEMS, Account Managers (i.e. brokers and custodians) record ownership details. This places control over ownership records into the hands of the brokers and custodians. It requires those entities to

have software to process all corporate actions.

SEMS systems level documentation is non-existent. Furthermore making changes to the source code immediately voids the warranty. We believe that it would be extremely difficult to modify SEMS to meet Jordan's requirements. We have therefore strongly recommended replacing SEMS with software more closely matching SDC's requirements.

USAID has a suite of depository /registry software. We are proposing to custom tailor these programs (under USAID auspices) to meet the requirements of the Jordanian Capital Markets. If necessary, alternative software can be acquired via international tender. We propose to interface the software that we install to ASE's automated trading system regardless of which system ASE implements.

Our proposed software offers logical workflows for data retrieval, data input, and transaction processing. It includes many safety features for protection of data and to ensure accurate and complete input of information.

This section of our report explains our recommendations regarding the essential business functions and operations of the SDC. We propose to follow these recommendations when developing software and systems for the SDC using USAID software.

Clearing and settlement component

This component includes a securities depository whose function is to minimize the number of persons and transactions involved in the process of clearance and settlement of securities transactions and the registration of securities ownership. A depository accomplishes this function by immobilizing or dematerializing securities or records of securities ownership through the process of holding ownership as custodian or nominee for the persons who are participants in the depository.

We are recommending that the Jordanian market establish a "World Class" clearing and settlement regime. There are a lot of complexities involved in this process. A lot of time will be needed to train and prepare market participants. A large amount of paper certificate handling must be performed before the depository can be fully established. We are therefore recommending that the Jordanian authorities take a planned gradual approach to establishing its clearing and settlement facilities.

We are recommending a model of best practice in securities market clearing and settlement as described by the International Federation of Stock Exchanges (FIBV), the Group of Thirty and the International Organization of Securities Commissions (IOSCO) and adapted for the Jordanian environment.

Mission of the Securities Depository Center

The Securities Depository Center (SDC) has been established as an independent company. Its mission is to service its participants who include members of the ASE and all investors, both domestic and foreign, trading securities in Jordan. SDC will provide safe, accurate and cost effective safekeeping and financial services for its participants and for their clients. It will provide value-added services for all participants who in exchange for those services will be charged established fees that will be regulated by the SDC Board of Directors.

The depository will minimize the physical documentation, automate the settlement process for both securities and cash, and provide a secure automated depository for investors' securities.

The Depository system will handle delivery of securities and payment of cash. "Security settlement" will be accomplished by debiting and crediting participants' book based holdings of securities in the depository. "Cash settlement" will occur through debiting and crediting participant accounts in the settlement bank.

General Recommendations

We recommend that all qualified market participants be given access to the depository on a nondiscriminatory basis on commercially reasonable terms. To facilitate efficient operation, direct participation in the depository should be limited however to licensed market intermediaries who are subject to financial responsibility regulations and requirements regarding segregation of customers' funds and securities. We also recommend that a Settlement Guarantee Fund be established to ensure that settlement occurs even if one of the market participants were to fail in completing its settlement obligations.

We recommend settling securities transactions on a multi-lateral net basis, but only after a Settlement Guaranteed Fund has been established (until that time, settlement would be on a trade-for-trade basis). Money settlement will be on a net payment basis. All settlements will occur through the depository. Persons with physical shares will lodge them with the depository (through their broker) prior to sale. The depository will deliver the shares to the relevant Registrar (which might be itself). The Registrar will verify or reject the deposit and if accepted, credit the Beneficial Owner's depository account.

We recommend that finality of securities transactions in Jordan be based upon the concept of delivery vs. payment ("DVP"). We also recommend elimination of certificates for shares held by the depository.

Basic SDC Functions

SDC will perform all functions necessary to settle exchange trades. It will operate an account based electronic book-entry system for transfer of share ownership. The basic functions will be selectable via menu (See Figure 2)

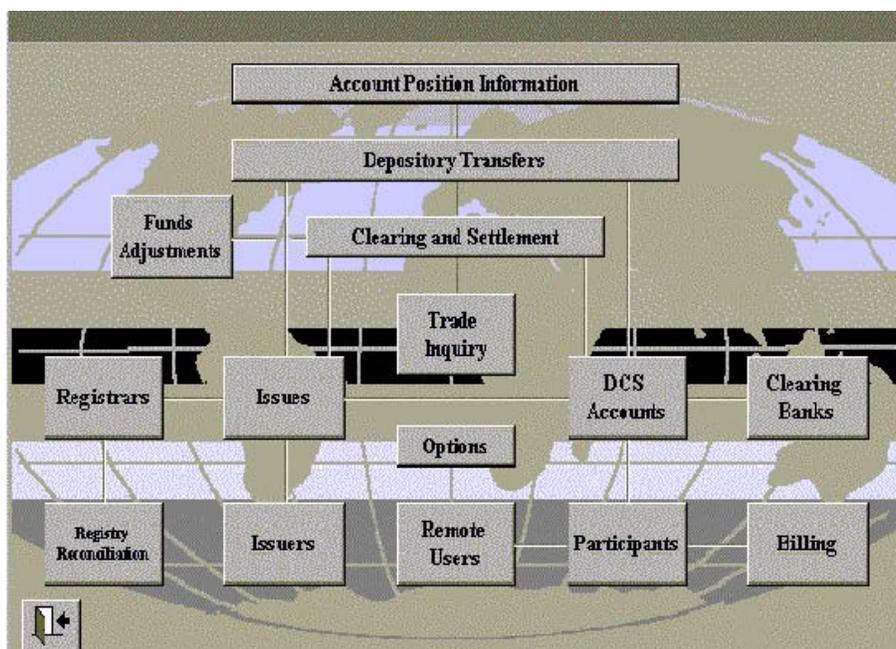


Figure 2. Sample Depository Workstation Menu

The basic operations to be performed by SDC are:

- Accept deposits of securities – physical certificates (Free transfer).
- Ensure the safe custody of deposited securities.
- Process book entry transfers of ownership of securities in exchange for payment to settle a trading transaction (Value transfer).
- Book entry movement of securities without cash (Free transfer).
- Satisfy requests for withdrawal of securities.
- Process deposits of new issues directly from the issuer.
- Pledge /Release of shares that have been hypothecated.
- Provide stock borrowing and lending.

Settle All Trades (of Depository Eligible Shares) Electronically

To make settlement truly efficient, all trades (whether in physical or dematerialized mode) should be settled electronically. This would eliminate the fragmentation that would result from the treatment of physical scrip as a separate security from its book entry counterpart.

Implement Automated Settlement (SEMS or other)

We are proposing to implement a clearing, settlement, depository and registration process that will function in the following manner (*See Figure 3*):

1. Brokers will submit their orders to the automated trading system. We have recommended to the ASE that the broker enter a client reference number or an order number with each order at order entry time. The purpose is to enable broker to match their orders to the trade reports they receive from the trading system.
2. Immediately after a trade is executed the trading system should deliver a trade confirmation to both the buying and selling brokers. The trading system will report the trade as “locked-in”. Each broker’s confirmation should include that broker’s client reference /order number.
3. The system will also report the trade to the clearing and settlement process. The ETS system performs this task by creating a text file of executed trades at the end of trading day. This file will be passed to the depository computer for processing.
4. The SDC computer will send to each participant a list of their confirmed (i.e. locked-in) trades.
5. Brokers who wish to use the depository to settle trades with /for their clients will submit the details of those transactions to the depository system which will, in turn, report those details to the counterparties involved.
6. Each business day the depository will publish a Settlement Statement for every depository participant. The statement will show that day’s settlement details plus the details of every pending settlement.
7. At settlement time, the depository will check each participant’s funds availability (through the Settlement Bank) and each participant’s share holdings. If sufficient funds and shares are available, the depository executes the settlement (by instruction to the settlement bank and by book-entry of shares).
8. Upon completion of the settlement cycle, the depository sends a report of the share and funds movements that have occurred.

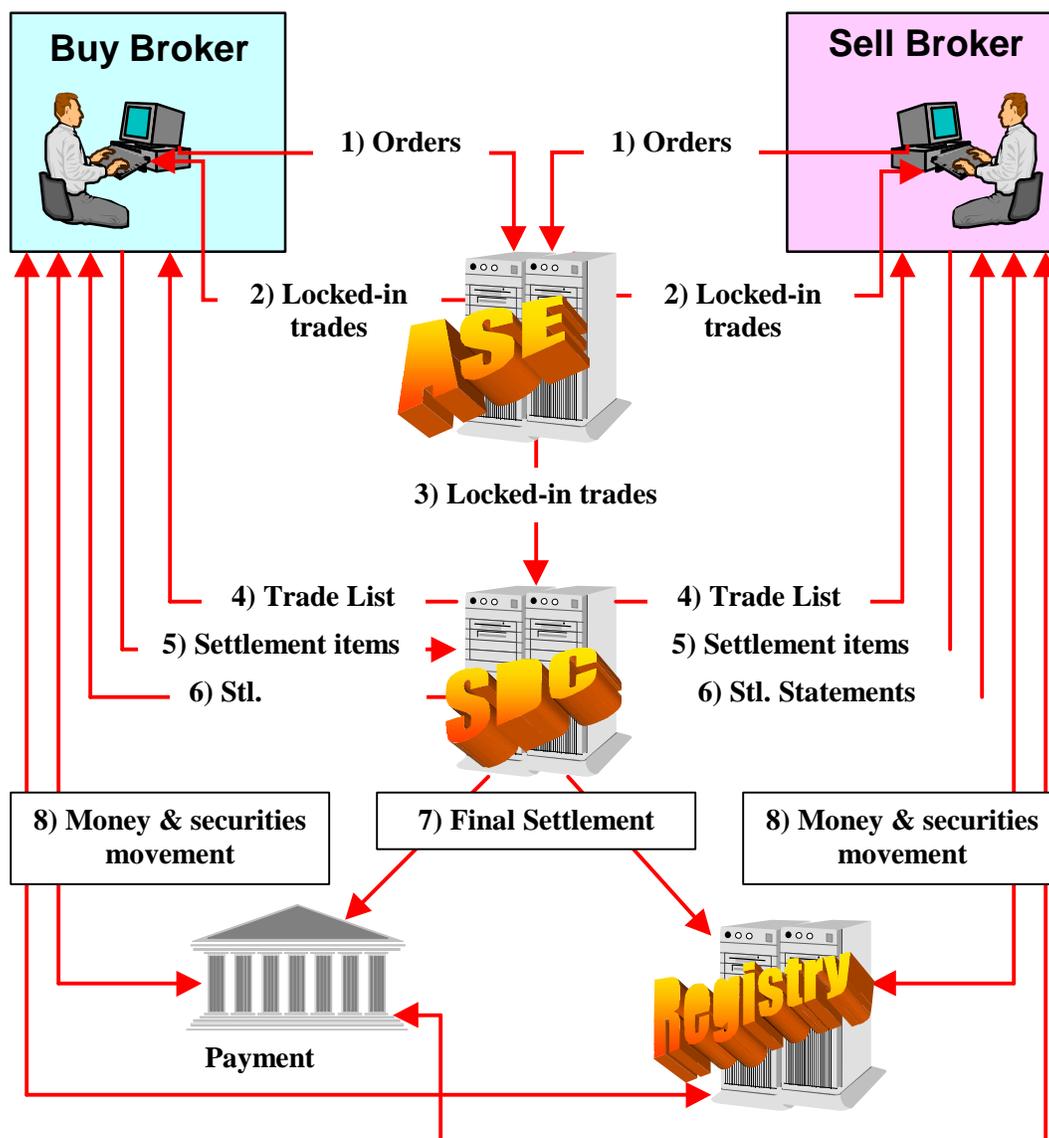


Figure 3. Trading and Settlement Data Flow

Follow the Group of Thirty's Recommendations

The nine recommendations of the Group of Thirty as revised by the International Society of Securities Administrators (ISSA) are as shown below. Following each recommendation are comments as to applicability to the Jordanian environment. These comments are italicized for ready identification.

G30 # 1. Trade Comparison by T+0

All comparisons of trades between direct market participants (i.e. brokers, broker/dealers and other exchange members) should be accomplished by T+0. Matched trade details should be linked to the settlement system.

This recommendation deals with comparison of broker-to-broker transactions (trades). In the US, we call this the “street-side”. Once it is implemented, ASE’s automated trading system will deliver “locked-in” trades on T or trade day.

G30 # 2 Positive Affirmation for Indirect Participants

Indirect market participants (such as institutional investors and other indirect trading counterparties) should achieve positive affirmation of trade details on T+1.

This recommendation is extremely important from a broker's perspective. It deals with the broker-to-client (called "customer-side") transactions. It is aimed at settling the trades of Institutional Investors, who are known as "indirect market participants" in G30 parlance. Properly implemented, it can eliminate the need for brokers to finance settlement of their institutional trades. It is in the interest of both the broker and the client that settlement be through the auspices of the SDC. The result is a dramatic reduction in risk and costs for both parties.

In the absence of a depository, settlement occurs as follows. First the broker settles the trade they executed for their client. They must pay the selling broker for any shares they have purchased or deliver shares to the buying broker for any shares they have sold. Only after they completed the street-side settlement can they settle with their customer. Institutional Investors generally insist on Delivery versus Payment (DVP is discussed under G30 # 5). As a result, brokers are usually obliged to make payment (to the buying contra broker or to the selling client) for their institutional trades before they are themselves paid. Since the broker may not get paid until a day or two after settlement, they are exposed to the cost and risks of financing the settlement. This is why many brokers charge extra for such trades.

Obviously Institutional clients do not want to settle any trades in their name until they have agreed to (affirmed) them. This necessitates a lot of coordination between parties (the broker, the client, the investment advisor, and the custodian). Basically we suggest settling Institutional trades, as visualized by the G30 recommendation #2, in the following manner (*See figure 4*).

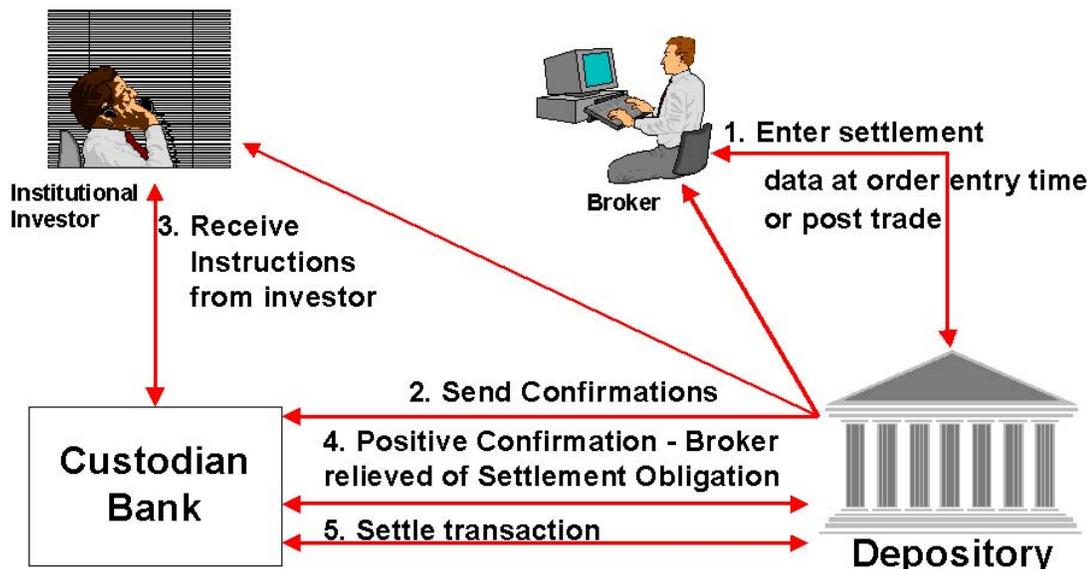


Figure 4. Positive Affirmation of Trades

Brokers would report the details of their institutional trades to the depository (SDC) system using SDC workstations. Remember, the actual trade or trades have already been reported to settlement by the stock exchange's trading system. Also please note, there may not be a direct relationship between the trade(s) performed by the broker

and the customer settlements. For example, one trade may be allocated across several customer accounts (all controlled by a common entity). Correspondingly, several trades may be executed in order to accumulate (or dispose of) the number of shares requested by the client(s). Of course you could also have several trades made which are then distributed across multiple accounts.

SDC would then send (preferably on-line) a confirmation statement of the trade to the various participants who had an interest in the trade. This could be done via computer-to-computer direct transmission, via Telex, fax, SWIFT, Internet, etc. The recipients would include the submitting broker the investment advisor, the custodian, settlement bank, etc. Please note that several intermediaries can be involved (4 to 6 is not unusual), particularly in cross-border trades.

The order's originator (usually the investment advisor) would verify the details of the trade. If satisfied, the advisor would instruct the custodian to settle the trade and provide the custodian with the account names, numbers and other client settlement details. The custodian would then "Affirm" the trade at their SDC workstation. SDC would then settle with the custodian directly, effectively transferring the settlement obligation from the broker to the custodian. Both broker and custodian would gain from this arrangement.

Of course there are a lot of other complications. For example, the custodian must receive the funds needed for settlement from the client. If the client uses a different currency, they have a FOREX transaction to handle. Time zone and holiday differences add somewhat to the complications. Nonetheless, this approach results in fewer "Fails" and reduced risk

G30 # 3 Central Securities Depository

Each country should have in place an effective and fully developed central securities depository, organized and managed to encourage the broadest possible direct and indirect industry participation. The range of depository eligible instruments should be as wide as possible. Immobilization or dematerialization should be achieved to the utmost extent possible. If several CSDs exist in the same market, they should operate under compatible rules and practices, with the aim of reducing settlement risk and enabling efficient use of funds and available cross-collateral.

By its very existence, SDC satisfies this recommendation. Once SDC is fully operational, nearly all settlements will be performed through its services.

G30 # 4 Real Time Gross Settlement or Netting

Each market is encouraged to reduce settlement risk by introducing either Real Time Gross Settlement or a trade netting system the fully meets the "Lamfalussy-Recommendations".

We believe that Real-Time Gross Settlement (RTGS) is a superior settlement method and recommend its use. The banking system in Jordan however, may not support Real-Time money settlement. If so, alternative suitable arrangements will be devised. Our proposed system will enable adoption of RTGS whenever Jordan's banking system can support it.

We recommend settling all transactions on a multilateral net basis (by Novation) provided a Settlement Guarantee mechanism is in place. We recommend Money settlement on a net payment basis.

Settlement obligations have two legs – the seller’s obligation to deliver securities to the buyer, and the buyer’s obligation to pay funds to the seller. These obligations can be settled on a trade-for-trade basis or calculated on a gross, bilateral net, or multilateral net basis.

Netting by Novation replaces the contract between the buying broker and the selling broker with a contract between the buyer and the SDC and another between the seller and the SDC. As transactions are processed, they are netted together. Participant rights and obligations vis-à-vis other participants are then replaced by an obligation or right to deliver or receive a net amount of securities to or from the SDC. A corresponding obligation or right to deliver or receive a net payment is also created. Novation allows a sequence of buyers and sellers to be replaced by an obligation between the "final" buyer in the chain and the SDC and another obligation between the "final seller" in the chain and the SDC.

The main purpose of netting is to reduce the number and value of delivery and payment transactions needed to settle a given number of trades. Netting reduces the volume and value of settlements by 40 to 60 percent on a bilateral basis and 70 to 98 percent on a multilateral basis. This reduces liquidity demands, transaction costs, and, if properly controlled, the risks associated with settlement.

Netting of transactions can address liquidity risks by reducing the size of payments required to complete settlement of a day's transactions. Credit requirements may decrease as a result of netting. This may be partially offset by a requirement to deliver letters of credit or collateral to the SDC as part of its risk protection mechanisms.

G30 # 5 Delivery versus Payment (DvP)

Delivery versus Payment (DVP) should be employed as the method of settling all securities transactions. DVP is defined as follows: Simultaneous, final, irrevocable and immediately available exchange of securities and cash on a continuous basis throughout the day.

Additional systems will be needed to deliver true DVP. A primary function of DVP is to minimize the risks associated with settlement. The Bank for International Settlements (BIS) has identified three broad structural approaches to minimizing those risks. The models are:

Model 1: systems that settle transfer instructions for both securities and funds on a trade-by-trade (gross) basis, with final (unconditional) transfer of securities from the seller to the buyer (delivery) occurring at the same time as final transfer of funds from the buyer to the seller (payment);

Model 2: systems that settle securities transfer instructions on a gross basis with final transfer of securities from the seller to the buyer (delivery) occurring throughout the processing cycle, but settle funds transfer instructions on a net basis, with final transfer of funds from the buyer to the seller (payment) occurring at the end of the processing cycle;

Model 3: systems that settle transfer instructions for both securities and funds on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.

While this taxonomy is useful in identifying sources of risk in different types of systems, the BIS report concluded that the degree of protection against systemic

risk that a system actually provides depends more on the specific risk management safeguards in place than on which model is employed.

G30 # 6 Same Day Funds

Payments associated with the settlement of securities transactions and the servicing of securities portfolios should be consistent across all instruments and markets by adopting the “same day” funds convention.

This is a banking issue and is somewhat beyond the competence of the SDC. Other suitable approaches (e.g. an "Assured Payments" or similar scheme) will be devised in the interim. As noted previously, the system will be functionally able to adopt same day funds at such time as the banking system permits.

G30 # 7 T+3 Rolling Settlement

A rolling settlement system should be adopted by all markets. Final settlement for all trades should occur no later than T+3.

This will be satisfied once the SDC is fully operational.

G30 # 8 Securities Lending and Borrowing

Securities lending and borrowing should be encouraged as a method of expediting the settlement of securities transactions. Existing regulatory and taxation barriers that inhibit the practice of lending securities should be removed.

The Jordanian market does not appear to currently provide for borrowing or lending. Its use will significantly reduce settlement "fails" and the risks associated with them. There are a number of legitimate reasons why a trade might fail. These include such things as time zone and holiday differences between Jordan and foreign investors. In such cases, borrowing /lending will help better manage settlement risks. It will also serve as an income source for large institutional investors. The proposed system supports borrowing /lending. This will be implemented as soon as the legal issues are resolved.

G30 # 9 International Standards

Every country should adopt the standard for securities messages developed by the International Organisation for Standardisation (ISO Standard 7775). In particular countries should adopt the ISIN numbering system for securities issues as defined in the ISO standard 6166.

We are recommending that Jordan, if it has not already done so, establish an ISIN numbering agency and that all securities be assigned an ISIN. We also suggest that international message standards be followed to the degree feasible.

The International Securities Identification Numbering System (ISIN) provides a uniform structure for uniquely identifying specific securities issues. It is intended for use in any application in the trading and administration of securities. The ISIN consists of the following:

- a) **a prefix** which is the alpha-2 country code as found in the ISO 3166 publication titled Codes for the representation of names of countries.
- b) **the basic number**, which is nine character (letters and/or digits) in length. Where the existing national number consists of nine characters, this number

shall be used; where the existing national number consists of fewer than nine characters, this also shall be used, but zeros shall be inserted in front of the national number. Where a national check digit exists, it shall be regarded as part of the basic number within the nine characters;

c) a **check digit**, computed according to the modulus 10 "Double-Add-Double" as described in annex A.

Develop a System for Depositing Certificates in SDC

As previously mentioned, we are recommending the dematerialization of securities held by the depository. This will eliminate the need for SDC to maintain a large vault. If this is done, a key function of the depository will be to dematerialize certificates. Depository Participants (DPs) will deliver shares they receive from their clients to the depository. The depository will then either forward them to the Issuer or Registrar, or if it manages the Registry, process the deposited certificates themselves. When the shares are validated, the depository will transfer them from a scrip-based client holding into a Participant's Settlement Account.

The client will usually deliver certificates and signed transfer instructions to their broker. We suggest that the broker electronically inputs data from those documents into the system. Details of the transfer and the client's scrip will be transmitted to the Registry System.

Develop a system for Rematerializing Securities

SDC should provide certificates for those clients who want them. This means that the SDC /Registry system must maintain certificated and uncertificated accounts.

Establish a Delivery Window

To handle deposits, a secure area for the handling and safekeeping of these certificates while they are in the depository's possession must be established. The secure area should have a small fireproof vault for the temporary storage (mostly overnight) of certificates.

A Delivery Window is also needed. This is the location where members would deposit their certificates and receive depository services. It should be located in a secure area. It may be desirable to provide large lockable mailboxes (next to the delivery window) for depository participants, especially if large quantities of paper (large printed reports, rematerialized certificates, signed documents, notices, etc.) must be delivered to participants on a daily basis. The mailboxes will not be needed if the computer distributes most such material.

Shares in physical form will be deposited with the Registrar prior to trading. Client will deliver certificates and a signed Transfer Deed to their broker. The broker will key the data from those documents onto the SDC computers. Details of the transfer and the client's scrip will be transmitted to the Registry system.

The brokers will then deliver the certificates, transfer deeds and deposit forms in pouches or envelopes. The broker will deliver the pouch to the SDC Delivery Window. Alternatively, the shares could be moved in bulk deliveries from their respective Custodians to the SDC /Registrar. The Registrar will provide immediate credit (or an immediate rejection) for the deposited shares. The goal is to accept or reject deposited scrip within a few days.

All deliveries of certificates to the depository should be scanned and their images stored on non-erasable media such as optical disk (or microfilmed) at their point of entry. Certificates

should also be filmed just before being delivered to the issuer or registrar. These facilities should be in a separate secure area, immediately adjacent to the receiving window.

The SDC will perform a “Good /Bad” delivery check against the deposit. Certificate numbers will be validated against the data base of invalid (i.e. faked, forged, stolen, dematerialize etc.) certificates.

Good shares accepted by the Registrar will be credited to the Depository Account of the Beneficial Owner if he or she has one. Otherwise the shares will be credited to the submitting broker’s SDC Account. This facility will enable the transfer of shares from a certificate based client holding into a broker’s Settlement Account.

Bad deliveries (with the reason for rejection) would be reported immediately and electronically to the broker.

Each trade is considered to have two settlement components:

1. a broker-to-broker component which is locked in and which will be applied against the broker’s clearing account in the Central Depository System, and
2. an investors component which is applied against a depository account.

Trades will be received by SDC at the end of each trading day. Trades will only be accepted for securities that are depository eligible. Trades that settle on a physical basis are not included in the depository, clearing and settlement process. Trades received from the Trading System will include information to tell the SDC System if the trade will settle with the broker directly or with a Custodian Bank acting as a settlement agent.

Develop Broker and Participant Interfaces

Brokers and Custodians need systems to interface with the SDC and to manage the assets over which they have custody. These systems will be a vital link between the exchange, its members and the investors that the brokers and custodians represent. The settlement bank or banks need a system to manage the settlement accounts of brokers and custodians that they represent. These systems should work together in as seamless a manner as possible. Tools for synchronizing trade and settlement records with member records are needed.

Depository participants will access both the SDC and Registry systems from their SDC workstations. This would give depository participants a single point of access to all functions permitted them.

The Depository system will interface with the Share Registry system to process customer name transfers from Direct Participants. The Direct Participant enters a transaction, using the Depository Remote User application, to transfer shares ‘*from street name*’ on behalf of their customers.

After the transfer is submitted to the Registry System for processing, the Registry System (See figure 5.) attaches the status ‘*awaiting registry*’ until the Registry personnel retrieve the transaction. Once the transaction is open, the status updates to ‘*at registry*’, and the transaction data is being verified by Registry personnel. If the data is accepted, the status updates to ‘*completed*’. If for some reason the transaction is rejected, the status updates to ‘*registry rejected*’. If rejected, the Direct User has the option to 1) correct the data and resubmit the transaction or, 2) cancel the transaction. The ‘*awaiting posting*’ status is issued after the transaction has been successfully transferred to the Registry System. The awaiting action is the actual posting of the securities to the individual shareholder.

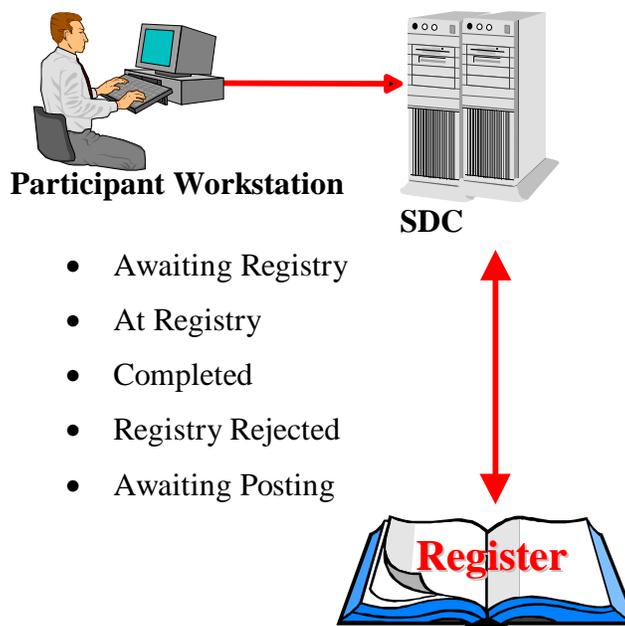


Figure 5. Flow of Information and Status Options

Develop Settlement Bank Interfaces

In settling security transactions SDC will use one or more banks for the payment and receipt of funds. This bank will be referred to as the “Settlement Bank”. All market participants must use the Settlement Bank when settling trades with SDC.

There are two principal issues to be considered in selecting the Settlement Bank:

1. the ability to “clear” funds such that the Central Depository is guaranteed that funds paid on settlement day are irrevocable, “good” funds;
2. the ability of the Settlement Bank to provide sufficient risk management on the market participants such that the payment of settlement funds proceeds smoothly .

A secure electronic interface between the SDC computers and the Settlement Bank computers is required.

Develop a Registry System Interface

A clean, tight interface between the depository modules (clearing and settlement) and the Registry modules must be created.

Establish a Lost, Stolen and Counterfeit Securities Database

We recommend that SDC create an on-line database of lost, stolen and counterfeit securities. This database should be queried whenever physical certificates are introduced into the system.

Develop a Full set of Settlement Reports

We suggest that SDC develop a full set of Settlement Reports. At a minimum, we suggest the following reports:

Trade Detail Report

This report reports the detail of each trade accepted from the ASE Trading System on a given day.

Trade Import Exception Report

This report reflects the details of all trades that failed the trade import cycle.

Actual Bank Settlement Report

This report reports net funds settlements obligations for a given settlement bank.

Participant Settlement Projection

This report reflects details of Trade for Trade settlements. It also reports net figures of anticipated securities and funds settlement.

Billing Detail Report

This report provides the details of all transfer activity within SDC by its Participants for a specified time period. It is used to bill participants for SDC services. It details all transfer, position, trade and information request activity within the depository over a specified period.

Billing Summary Report

This report summarizes the information shown in the Billing Detail.

Depository Account Statement Report (Detail)

This report details the trade transfers in a given SDC account over a specified time period. It consists of two parts; Summary of Account Positions and Detail Information.

Depository Account Statement Report (Summary)

This report generates customer statements by summarizing the positions of a Participant's account over a specified period.

Failed Settlements Report

This report lists all failed securities settlement obligations. This report is used to alert the depository of potential problems prior to settlement date.

Record Date Report

This report identifies the holders of a given issue in all depository accounts on a specific Record Date. This report has two parts; Summary and Detail Information.

Develop tools for synchronizing records

SDC should insist that all participants verify on a daily basis that their internal records exactly match SDC's records.

Develop Risk Management tools for the depository

The stability and financial health of SDC participants is an important indication of potential trouble. SDC should establish standards for participation as a first line of defense against risk. These standards should ensure a minimum capacity within each participant to withstand financial problems. They should include minimum capital requirements plus a certain level of

liquidity requirements and operational capabilities. Unless its participants can withstand shocks, the SDC and its participants will be subject to unacceptable risks transmitted from other, less solid, participants. Since SDC will create a certain amount of risk sharing, participation standards should be established to control the amount of risk they must share.

Participation standards must be monitored on a periodic basis and enforced with sanctions in extreme cases, suspension from the clearing and settlement services. To monitor adherence to standards, SDC will require access to audited financial statements and some of the data filed by participants with the Securities Commission. This data should be reviewed at least quarterly. Participants who have previously failed to maintain certain standards or who are close to falling below a standard would be subject to more frequent reviews.

Enable Remote Access to the Depository

Twelve purpose-built desks have been installed in the new SDC offices. These desks were to be outfitted with depository workstations. These workstations were to be used by SDC members to enter information into the Depository system. We suggest abandoning this plan. To begin with, 12 booths may not be sufficient for 33 brokerage firms. Secondly, in order to use the workstations located on SDC premises, brokers must carry confidential documents and client files to the Hamzeh Building. To add to their aggravation, they may find it necessary to either queue up for usage of the workstations or schedule their use. Finally, we believe that the location of these workstations will act as a disincentive to custodians who might otherwise consider participating in the depository.

We recommend that SDC enable its participants to access directly the depository and registry systems from their offices. The brokers located in the Housing Building should be able to access the depository system using the inter-building network. The remaining brokers could be given dial-up access to the system.

Acquire /Build a Broker Back-Office System

Brokers need a back office system as well. That system should account for customer and firm assets. It should have the ability to track deposits, withdrawals, trades and all other activities associated with a brokerage firm. We recommend that SDC poll its membership to determine their immediate requirements vis-à-vis systems support. We suggest that SDC consider purchasing or developing a modest Back-office system for those members who would be unable to settle through the depository otherwise. Since the benefits would accrue to only a sub-set of members, those members should be charged a fee for the software. Ultimately, it is probable that one or more local firms will develop software for this purpose, thus relieving SDC of responsibility over participant software.

Dematerialize Depository Holdings

Certificates are a fact of life in Jordan and will continue to be used, probably for a very long time. Many investors will want to continue holding certificates. Gradually these investors may move their holdings into the depository. However they need to develop a certain level of comfort with the depository concept first.

However, the depository does not need certificates to identify its holdings. We suggest that SDC's holdings be dematerialized. This could be a relatively straightforward affair. Each register would have two basic accounts, one for certificated holdings and the other for dematerialized holdings. At all times, the total of the two accounts should equal the total number of shares authorized and issued.

Migrate Shareholdings into the Depository

In establishing the depository, SDC must process a mountain of certificates. The sheer magnitude of this task makes it essential that it be done in a planned and orderly way. We suggest the following steps be taken:

Begin with a few selected securities. Choose the securities based on the perceived quality of the existing registers. By beginning with just a few securities, the staff learning curve can be improved and system bugs can be unearthed with minimal disruption.

Audit the existing share Registers for the selected securities. Upon completion of a successful audit make those securities depository eligible. A contract should be executed between the Issuer /Registrar and the SDC on responsibility for errors in the Register passed to SDC.

Transfer the audited Registers to SDC's automated books.

Begin accepting deposits of eligible securities. This first step is to deposit institutional investor holdings into the depository. All holdings in depository eligible scrip should be deposited. Clearly this is the normal preference of the institutional investors.

The process begins with the custodian preparing a list of the holdings they are depositing. The list should be in both electronic and paper form. The custodian would enter at their SDC workstation information about the certificates being deposited. The data supplied should be comprehensive and should include the distinctive numbers of the scrips being deposited. The SDC or the Registrar would compare the data received against its own electronic records.

Discrepancies would be set aside and researched. The Registrar or SDC personnel would then go to the custodian's premises and examine and count the shares in the presence of an auditor. Upon verification of the count, the custodian would endorse a Global Transfer Deed. The Registrar /SDC would deface the certificates (perhaps by drilling holes in them) and take possession. The SDC would immediately credit the custodian's account(s) in the depository for the deposit. It would mark the deposit in the Register database as being in dematerialized (uncertificated) form. The custodian would then verify whether its depository account was correctly updated.

The custodians and Registrars have widely varying systems. It is therefore essential that the electronic list be easy to create. It should be a standard sequential file that is simple for the custodians to generate from their existing records. It should also be in a format that is easy for the Registrars to use in verifying against their own records. This format should be standardized. The formats should be published widely and used by all parties.

The sheer numbers of certificates and transfer deeds makes endorsement of each a monumental task. A single Global Transfer Deed should be used. The program that created the electronic list could be used to create this form. As an alternative, a simple PC program could be created for this purpose. The program would read the diskette and create a standard Global Transfer Deed. All participants could share the program. Small investor holdings would be processed in batches deposited by brokers at the SDC Deposit Window.

Establish an ISIN Numbering Agency

If not already adopted, the ISIN standard should be established in Jordan. There are several tasks, which must be accomplished in order to do this. They are as follows:

- Establish the ISIN Agency of Jordan.
- Apply to the Registration Authority for ISO 6166 for an ISO 6166 country code for Jordan. (I believe the code is JO.)

- Establish the basic number (national numbering system).
- Delegate national numbering system maintenance to the ISIN Agency of Jordan.
- Establish procedures for Issuers to interface with the ISIN Agency for issuance of the national (basic) number.

If not already established, all of the above steps should be performed by the JSC either directly or under its direction immediately or as soon as practicable. I recommend that the ISIN Agency be set up within the SDC. This is a good place to start and the depository has the most at stake in seeing that the job is done well. The Registration Authority address is:

Registration Authority for ISO 6166
 c/o ANNA S.C.
 1. rue de Varente
 CH - 1211 Geneva 20

As soon as the JSC creates the ISIN Agency function and delegates the responsibility to the SDC, they must explain to the depository what they have taken responsibility for. The SDC should create interface procedures between themselves, the issuers and the ISIN Agency.

Train SDC Staff and Users

We recommend that training courses be developed for the training of all SDC participants in the clearing, settlement of securities trades and the registration of ownership through the system. We would conduct intensive training for trainers so as to develop a cadre of personnel fully capable of conducting on-going training of staff and users. We would train the IT staff in maintenance and modification of the system. This would include Oracle training as that is the database system of preference (and in use) to the JSE IT Department.

Develop a disaster recovery program

Loss of the Depository or Registry system or their databases would have unacceptable negative consequences for Jordan's markets. SDC must develop and implement a very robust and comprehensive Disaster Recovery Plan. Several levels of back-up should be provided. Copies of each days starting database, transactions, ending database, software modules, etc. should be recorded on non-erasable media and stored off-site under very secure conditions.

Promote the Depository

A securities depository is a new concept in Jordan. It will provide a very valuable service to the investing community. It will not be used however, if investors are not made aware of its value, We therefore recommend that SDC conduct an extensive and on-going campaign to introduce Jordanians to the depository and its benefits. We suggest the following:

- Provide information and training courses for participating brokers and custodians,
- Provide information and seminars for the investing public,
- Reach-out to international investors to become users,
- Publish a periodic depository bulletin,
- Expand securities that are eligible for depository,
- Expand products that are depository eligible,
- Expand systems to remote locations,
- Process new participants and maintain a profile database on all participants,
- Develop a trade affirmation system for indirect market participants,
- Consider developing an interface with other depositories in the region.

Develop a Share Registry and Accounting System

Background

We interpret Jordan's Securities Law as requiring SDC to maintain a register of ownership of securities traded on the ASE. We base our interpretation on Articles 29, 30 and 76, portions of which are shown below (from an unofficial translation):

Article (29)

- a) A center to be called the Securities Deposit Center shall be established in the Kingdom for the deposit and transfer of ownership of securities traded on the Securities Exchange and settlement of the prices of such securities among financial brokers. It shall be the only agency authorized to carry out such activities in the Kingdom.
- b) The Center's aim shall be the safekeeping of ownership of securities listed on the Securities Exchange.

Article (30)

- a) Registration and transfer of ownership of securities traded on the Securities Exchange and the settlement of trades of such securities among financial brokers shall be made by entries in the Centers records.

Article (76)

All issuers of listed securities shall deliver registers of owners of securities issued by them and any data related to these registers and owners of securities entered in them to the Center or to holders of accounts with the Center, in accordance with instructions issued by the Board of Commissioners in this respect.

Security holder registration component

This component is the process of registering securities ownership (following a sale or transfer of the securities by the holder) on the register (list) of security holders. A few countries have replaced individual share registries with a centralized registry; in some cases, a single institution is both central depository and registry. As previously noted, we interpret Jordanian law as requiring SDC to maintain the Registers of all securities listed on the exchange.

Regardless of the method used to handle registration; SDC is the responsible party under the law for accurate registration of ownership. We therefore recommend that SDC acquire or develop an automated Share Registration and Accounting System. That system should be closely linked to the clearing, settlement and depository system. This is an extremely important task. Creation of a central securities registry that replaces individual issuer registries increases systemic risk. If records of holdings were to fail (for example, a computer malfunction wipes out all records of depositors), the result would be catastrophic. It is therefore imperative to have an audit trail that permits reconstruction of the depository records.

Summary of the Duties of a Securities Registrar

There are (a) certain functions that a share registrar must perform for any enterprise whose register it maintains; (b) other functions it must be capable of performing, although some

enterprises may choose to perform them themselves; and (c) functions that a registrar need not necessarily be capable of performing, but which it is in a unique position to perform.

- (a) For any register it maintains, SDC must perform the following functions in an efficient and effective manner:
1. Maintain accurate security registers. This is the most obvious of its duties.
 2. Be familiar with, and in compliance with, all laws, regulations, or other directives that relate, directly or indirectly, to share register maintenance or to any of the duties of a registrar.
 3. Ensure that all persons with access to information contained in any share register treat such information as confidential to the extent required by laws, regulations, or any other directives.
 4. Ensure that at all times security registers are in balance and that for every share issued, a share is cancelled.
 5. Record transfers of ownership after receipt of all necessary documents. All elements in a capital market rely on the registrar's record of ownership.
 6. Record changes or corrections of information regarding security holders and their securities holdings.
 7. Record and monitor records of pledges, lost certificates, adverse claims, or other transactions, which result in the blocking of securities.
 8. Issue, cancel, and control the inventory and storage of certificates for enterprises that issue materialized securities.
 9. Produce lists of security holders, both security holders of record, and beneficial owners of securities in Nominee name if required by Law or regulation, as required or requested by an enterprise or other authorized body. Such lists may be required to determine which security holders are entitled to receive dividends or interest, to attend and vote at meetings of shareholders, or to participate in other activities of the enterprise.
- (b) SDC should also be able to:
10. Interface the Registry system with the Depository system.
 11. Process dividend and interest payments, including calculation, distribution, and accounting.
 12. Withhold and/or account for taxes on dividend and interest payments, if required by tax laws.
 13. Withhold and/or account for taxes on capital gains, if required by tax laws.
 14. Produce reports of dividend, interest, or capital gains, if required by tax laws.
 15. Notify shareholders, both shareholders of record, and beneficial owners of share held in Nominee name, of shareholder meetings, by mail, publication, or other methods.
 16. Produce, distribute, and calculate proxies or other media for shareholder voting.
 17. Perform operations to reflect ownership of securities when enterprises participate in a merger, a spin-off, or other reorganization.

18. Perform operations to reflect ownership of securities when an enterprise splits or consolidates its shares.
- (c) It is desirable, but not absolutely necessary, that a share registrar be able to:
19. Modify any software used in share register maintenance to reflect changes in law, innovations, or elimination of problems detected. If the registrar cannot perform this work with its internal staff, it should be out-sourced.
 20. Assist enterprises in the planning for, and conduct of, their shareholder meetings.
 21. Educate managers of enterprises and security holders of the rights of shareholders, the responsibilities of management to shareholders, and the relationship between management and shareholders.
 22. Educate managers of enterprises and security holders of laws, regulations, or other directives relating, directly or indirectly, to share register maintenance or to any of the duties of a registrar.

Since a company's shareholders are in constant change it is imperative that the Registry maintain accurate and timely records so that the issuing corporation knows at all times who its owners are and shareholder ownership is safeguarded.

As previously mentioned, the Registers must be audited and verified. Liability for accuracy must be established. Users and staff must be trained.

The same issues of security and disaster recovery planning apply to the Registry system as apply to the SDC itself. Since the Registry is the final evidence of ownership for all securities, it is imperative that it be fully protected and have multiple levels of back-up.

Establish a Settlement Guarantee Fund

The Settlement Guarantee Fund (SGF) is an industry fund used to insure safe settlement and the exchange of script and funds through the depository. Please note, it is not an investor protection fund, it is used to protect the settlement process.

By establishing a SGF, the SDC can guarantee settlement. Thus, when a member/broker cannot meet his trade obligation, be it as buyer or seller, the SGF will assume the obligation of the failing broker to complete settlement.

If the SDC is to be able to guarantee settlement, it must be in a financial position to make good on any defaults in existing settlement obligations. The Settlement Guarantee Fund is intended to provide the required source of funds to make good on settlement defaults. The SGF must be considered the last line of defense in ensuring the orderly settlement of trades. Before going to the Settlement Guarantee Fund the SDC must first make every effort to have the defaulting market participant make good on the default. Only in the event that the market participant is unable to remedy the default will the SDC make use of the Settlement Guarantee Fund to meet its settlement obligations.

The Settlement Guarantee Fund is a pool of cash and collateral placed under the control of the SDC by its participants. The fund is drawn upon to obtain funds needed to settle obligations when those funds are not provided as required by the SDC participant.

The level of contribution to the Settlement Guarantee Fund should reflect the size and normal settlement obligations for each market participant. The actual formula for determining the level of required contributions to the Settlement Guarantee Fund and the procedures for management and use of the fund will be determined by the Board of Directors of the SDC.

Contributions to the SGF should be mandatory for all depository members.

The fund exists to insure all investors are guaranteed that their trades will settle on settlement day and also to protect the clearing, settlement and depository operations from financial loss. Assuming settlements are guaranteed, the additional risk that the depository is assuming is to cover any shortfall generated in its buy-in/sell-out procedures.

SDC should maintain a Settlement Guaranty Fund to be used in the event of Member settlement defaults and certain other losses. SDC should establish a contribution percentage applicable to all Members based on the aggregate contract value of the Members' trades during the previous month. The Directors may adjust the percentage from time to time to reflect actual experience with losses. A Member's initial contribution should be based on the Directors' estimate of anticipated trading and risk levels. Each Member shall make required deposits in cash on demand. Initial deposits shall be made at the time a Member's application for membership is approved.

Neither SDC participants nor their creditors may make claims against amounts the participants have deposited in the Guaranty Fund except in the event of liquidation of the SDC or termination of their Participation in the depository. Furthermore such claims may be made only following satisfaction of the entire Members' obligations to the SDC and the Exchange. The Directors' determination of contribution amounts is final. SDC may invest the funds only in certain selected securities such as Treasury Bills. All earnings from the fund will accrue to the SDC.

SDC must continually monitor two key factors in establishing and managing a successful fund. These are contributions and administration.

Contributions:

1. Insure that all depository participants are fund participants and are meeting their financial requirements.
2. Review each participant's financial requirements on a daily basis and distribute billing statements as necessary.

Administration:

1. Review and adjust financial requirements annually.
2. Interact with Surveillance to review each participant's financial capabilities and adjust funding requirements if necessary.

Participant contributions may be inadequate to establish a robust Guarantee Fund. We suggest that a small fractional assessment be charged against each settlement. This assessment would be charged against each trade until such time as a suitably large corpus of funds has been acquired. This assessment approach could also be used to build up an Investor Protection Fund.

Establish an efficient Surveillance and Regulatory System

Regulatory component

The securities market must be well regulated. Securities markets may exist without securities regulation, but they will not succeed in fulfilling their basic functions if investors perceive fraud and manipulation to be the prevalent market practices. In a global environment where capital is scarce, investment will be attracted to those markets where risk/reward ratios are the most favorable. Unregulated and under-regulated markets present infrastructure risks in addition to investment risk. The higher level of uncertainty associated with such markets, the more they will discourage capital investment. Even when such investment is made, the costs of capital formation will be higher because investors will demand a risk premium for uncertainty. One of the principal functions of securities regulation is to eliminate this risk premium by creating a market environment in which securities transactions may be effected fairly and efficiently. Capital also will not be committed to markets where there is insufficient information to evaluate investment risks.

We understand that the JSC has developed a set of disclosure requirements. We are unfamiliar with those requirements. If these do not exist, we recommend that the Commission establish disclosure requirements for issuers whose securities are publicly offered or publicly traded, or who have more than a specified amount of total assets and number of security holders. They should be required to make public all information that would be material to an investment decision. We further recommend that the information disclosed be made available in electronic form, preferably through the Internet. This would enable easy access by all market participants.

Surveillance Component

To develop local investor confidence and entice foreign investments into the Jordanian Capital Markets and to further develop trust in using the exchange and the depository, rules that protect all investors must be established and enforced.

The ASE and the SDC are Self-Regulatory organizations (SROs). As such, they should establish their own Surveillance and Compliance Departments. These would, of course, be subject to oversight by the JSC.

ASE Surveillance Requirements

ASE's automated trading system should include the following capabilities:

- Real-time price, volume and other Alerts. The computer for statistically unusual movements in its price or volume should continuously monitor each security. Any unusual activity should generate alert messages to surveillance personnel for review and possible investigation. Surveillance personnel should have real-time access (read only) to all orders and transactions in the system. They should have on-call access to all historical files. Surveillance officials should be able to set surveillance and market control parameters (e.g. price movement limits) on demand.
- Online, real-time reviews of the various order books. This should include an ability to review all activity including order entry, execution, modification and deletion. Date and time information for each activity and step should be appended to each transaction.

- Online access to current and historical market activity. This should include an ability to replay (reconstruct) the market for any time period.
- Monitoring of participant market positions and risk exposure.
- Online and offline access to the system's audit trail.
- Monitoring of user logons, including invalid password attempts.

Market Surveillance personnel should be provided tools that enable them to reconstruct the market (by security, by sector or by market) as it existed at any point in time. They should be able to trace the flow of trading (including trader identification) over any period of time and at any level of detail. All of these tools should be available to JSC personnel and to exchange Surveillance. Member firms should have access to the audit trails of those trades in which they participated.

The Price Watch, Volume Watch and Block Watch modules will monitor unusual intra-day and inter-day price and volume fluctuations and signal unusual changes.

The trading system coupled with the depository system will enable the identification of trade participants and will have the ability to detect certain insider trades

SDC Surveillance Requirements

SDC's major needs are to monitor participant records and financial standings. Part of their concern is risk management. SDC should therefore monitor all settlements, even if the securities are not depository eligible. Participant positions should be continuously monitored (i.e. daily). Both gross and net positions should be monitored. If a participant poses a risk to the system at large, it should be immediately suspended and its positions closed out.

Develop a Corporate Disclosure System

Listed companies should be required to promptly advise the exchange of any news that might have an effect on the price of their listed shares. At that time, the exchange will halt trading for a designated period of time, following which it will release the news in electronic form. Trading will remain halted for a sufficient period of time to enable members with orders in the book, to adjust or cancel those orders.

Listed Companies must also report to the exchange, the depository certain key information such as dividend announcements, rights offerings, annual reports, etc. We suggest that the companies be encouraged to submit this information electronically as well as on paper. This information should be stored on the exchange and depository information databases. We suggest that it be made available over the Internet.

Establish Comprehensive Audit Trails and Historical Files

We recommend that all of the computer systems used by the ASE, the SDC and the JSC should maintain comprehensive Audit Trails and Historical files.

An **Audit Trail** is essential ingredient in market regulation. It should be available to both the ASE and the JSC. It should enable either party to review all trading activity in terms of the participants' identity, the time and price at which individual orders to buy and sell securities were entered and the time and price at which they were executed. The Audit trail is one of the tools used to deter fraud and market manipulation. It would be ideal if the Audit Trail were usable to reconstruct /replay the market. This would necessitate indicating on each Audit Trail file the version of the software that created the file.

A comprehensive **Historical File** of trading activity should be maintained on-line. We recommend keeping a minimum of 12 months of trading and settlement activity on-line.

JSC Needs

The JSC collects an enormous amount of information each month. This information can serve as an informational, analytical and advisory resource on the capital markets for the Jordanian government and, in the case of public information, for participants in the market. We suggest that the JSC develop a Monitoring and Research Unit to handle this information. That Department would have the following tasks:

- establish procedures for collecting, tracking and analyzing financial, statistical and trading information,
- develop and install a database system for collecting and tracking data,
- develop a methodology for producing periodic reports on the trends, issues and problems in the securities industry,
- develop compliance examination guidelines and techniques, as well as related training materials, and
- train local professionals for substantive roles in the JSC.

We recommend that the JSC develop a comprehensive database system that manages JSC data and organizes it in a usable form. The primary database would include information on all licensed market participants including, brokers, dealers, underwriters, securities consultants, investment funds, exchanges, their managers, registrars and depositaries. Regular reports would be generated based on information from the database and additional facts and data gathered by the Department staff. A corresponding procedure should be worked out as well for special information inquiries and reports.

Department staff should regularly collect information for the database from all available sources including the ASE, the SDC. It should collect information from the applications and forms for licenses and filings and reports submitted by market participants.

We recommend that the Department develop a software program for establishing a Regulatory database. The primary database will include information on all licensed market participants including, brokers, dealers, underwriters, securities consultants, investment funds, exchanges, their managers, registrars and depositaries.

The Department should support the JSC in developing forms, procedures and methodology for the preparation of quarterly and annual reports by market participants.

The Department should assist in the preparation of recommendations regarding compliance issues, including developing a procedure of instructing and reminding market participants of their responsibility to submit required reports to the JSC on a timely basis.

It should also assist in developing inspection techniques and inspection manuals for brokers, dealers, exchanges and investment funds to determine their compliance with the securities laws regulations.

Use the Internet to Develop the Market Internationally

It is currently estimated that the Internet is used worldwide by approximately 130 million people. The Internet provides an ideal environment for the Jordanian market to access a worldwide customer base, and to provide potential investors with large quantities of detailed information quickly and inexpensively.

We recommend that Web Sites be developed for the ASE, the SDC and the JSC. This can take the form of a shared Web Site or linked sites. We recommend that both English and Arabic Web pages be established.

Advertise the Jordanian securities market globally

Use the Internet to bring the Jordanian Securities Market to the World and the World to the Jordanian Market. Use it to distribute public information (e.g. trading and settlement rules, company reports, member names and addresses, research reports, etc.).

We suggest using including a map of Jordan as well of photographs of the Royal Family and key sites. It may be useful to have some short video and/or audio clips (perhaps of the old chalkboards metamorphosing into video displays of the electronic book). The key is to make the site speedy, attractive, informative and easy to use.

- Disseminate end-of-day prices, quotes and other market information via the Internet. End-of day data should be free of charge. We recommend that the exchange charge for real-time market information.
 - Provide bids and offers in Euros, Dollars and other currencies as well as in JDs. Publish the currency rates used and identify the data source (in the future, provide automated currency conversions). Provide links to the member that published each bid or offer.
 - When market conditions warrant, publish open, high, low, last, and hourly price and volume updates, 52 week high and low, Turnover value, Top Ten performers, Market capitalization, Daily market indices (sensitive, all shares, sector, etc.), Daily interest rates (deposit and lending), and short term, long term and Central Bank lending rates).
 - Disseminate Market News (e.g. Corporate Announcements, Monthly, quarterly and annual bulletins, Monthly, quarterly and annual company reports, Press Releases, etc.).
- Identify each exchange member and each depository member

Provide their names, addresses, telephone numbers, and other details on how to contact them. Provide each member one Web Page (charge a fee for additional pages). Provide dynamic links to the member Web pages.

- Enable brokers to publish their research and periodic commentary. Enable both public and private (i.e. only for specific clients) publication.
- Enable brokers and underwriters to identify potential direct investments to investors

Provide e-mail for all market intermediaries. Provide forms for communications between participants and investors.

- Publish a list of the securities of all traded Companies.

- Provide links to additional information on each quoted security or company. Offer listed companies web pages (for a fee) which they can use for public relations purposes.

Publish a daily Market Bulletin

- Include information on how to trade Jordanian Securities, as well as the trading rules, clearing and settlement rules and practices, depository rules, Registry rules, etc.
- Publish trading and settlement calendars

System Financing

We suggest that basic services be offered free of charge. Each exchange and depository member would be listed in the Web Site and provided one page for identifying themselves and how they can be reached. Basic information about each traded company would be included. Participant to Participant e-mail would be provided free of charge. Access to ASE surveillance and the JSC would be provided as a free service.

We suggest fees be charged for certain value-added services. This would include the Web pages provided to Brokers, Underwriters, Venture Capital firms and other market participants for advertising themselves. It would include the distribution of private research.

We suggest that ASE Brokers and custodians be provided fee-based, value-added e-mail services including:

- Secure client communications
- Electronic facilities whereby a potential client can contact a participating broker. This could be direct, through a correspondent broker or bank in another country, etc. – Note “Know your Client” remains an absolute rule
- Forms through which a client can identify themselves to a participating broker
- Standard Forms (e.g. client order, client settlement instruction, etc.)

Listed Companies should be offered advertising pages for which they would pay a fee. Internet users should be given facilities for retrieving electronic copies of corporate filings, and similar special reports for a fee. These fees would be charged against the requestor’s credit card using a secure, external service. Other services for which a fee might be charged are requests by clients for special research such as dividend queries and research into other corporate benefits.

Develop an Expanded Automation Program

The ASE, the SDC and the JSC have embarked on a very ambitious automation program. Because of various developments such as changes in the law and perceptions of market participants, the process has become more complex. We believe that it is essential that the three organizations take a comprehensive view of the entire automation process. We believe that automation can contribute significantly to expansion of the market. However, this expansion cannot be achieved without planning. The key things to remember in developing the plan are to keep it stable, simple and adaptable.

Develop a Formal Project Plan

The first step is to develop a formal Project Plan. Begin by defining what each organization wants and needs. Then analyze what resources are available. Select those resources are usable. Write the Project Plan and implement it. The plan should have clear easily understood and razor sharp milestones. These milestones should be usable by management and the three Boards of Governors to readily measure progress or the lack of progress. Some of the key tasks are:

- Assessment of Requirements
- Site Preparation, Installation and Testing
- Implementation Planning and Project Management
- Definition of Organisation Policies and Procedures
- Package Adaptation, Modifications and Testing
- User and Technical Training
- File Creation
- Acceptance Testing and Cut-Over
- Monitoring of Live Running

Project Timeframe

Building an efficient infrastructure for automated trading, clearing and settlement is a difficult and time-consuming task. It requires coordination between multiple constituencies including brokers (front and back office), the exchange, the depository, custodians, banks, the regulator, etc. Each of these entities needs computer systems that manage their part of the settlement process.

A large number of ancillary tasks (e.g. making securities depository eligible, auditing those securities' registers, training staff and users, writing trading and settlement rules, writing job descriptions, establishing the dial-up network, organizing a deposit window, etc., etc.) must be accomplished in the same period of time. Management and personnel from the three organizations must perform most of these tasks.