# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE OF CONTENTS</td>
<td>1</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>v</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>vi</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Internationalization of Securities Markets</td>
<td>1</td>
</tr>
<tr>
<td>Institutional Investors</td>
<td>1</td>
</tr>
<tr>
<td>Technological Developments</td>
<td>2</td>
</tr>
<tr>
<td>Growth Opportunities in Developing Countries</td>
<td>2</td>
</tr>
<tr>
<td>Deregulation of financial markets</td>
<td>3</td>
</tr>
<tr>
<td>Central Clearing and Settlement in Hong Kong</td>
<td>4</td>
</tr>
<tr>
<td>Objective of Study</td>
<td>5</td>
</tr>
<tr>
<td>METHODOLOGY</td>
<td>6</td>
</tr>
<tr>
<td>Data Collection</td>
<td>6</td>
</tr>
<tr>
<td>Sampling</td>
<td>7</td>
</tr>
<tr>
<td>WORLD-WIDE TREND IN THE DEVELOPMENT OF CLEARING AND SETTLEMENT OF SECURITIES</td>
<td>8</td>
</tr>
<tr>
<td>October Stock Market Crash of 1987</td>
<td>8</td>
</tr>
<tr>
<td>Current Trend in the Clearing and Settlement System</td>
<td>9</td>
</tr>
<tr>
<td>Development of the Clearing and Settlement Systems in Asian Countries</td>
<td>11</td>
</tr>
<tr>
<td>Implications for Hong Kong Stock Market</td>
<td>13</td>
</tr>
<tr>
<td>Rebuilding of a Good Image as an Efficient Market</td>
<td>13</td>
</tr>
<tr>
<td>Competition from Other Markets Trading Hong Kong Listed Stocks</td>
<td>14</td>
</tr>
<tr>
<td>Competition from Other Asian Stock Markets</td>
<td>15</td>
</tr>
<tr>
<td>Prerequisite to Becoming a Regional Exchange in Long Run</td>
<td>17</td>
</tr>
<tr>
<td>Possible Directions for the Future Development of Central Clearing and Settlement System in Hong Kong</td>
<td>18</td>
</tr>
</tbody>
</table>
Allowing the investors (especially the institutional investors) to be the direct participants of CCASS .......................................................... 19
Linking CCASS to the settlement systems of other national markets .......................................................... 19
Issuing global certificates with the consensus of the issuers of the stocks ........................................ 20

DEVELOPMENT OF THE CLEARING AND SETTLEMENT SYSTEM IN HONG KONG .......................................................... 21

History of CCASS ........................................................................... 21
Current Issues ............................................................................ 25
Cost Issue .................................................................................. 25
Legislation Issues ........................................................................ 27
Current Clearing and Settlement System .................................................................................. 28
How a Trade is Settled .................................................................... 28
Issues of the Existing System .......................................................... 30
Too short settlement ...................................................................... 30
Physical settlement ........................................................................ 30
Exposures to counterparty risk ....................................................... 31
Chain reaction of settlement risks .................................................. 31
Risks for loss of scrips .................................................................... 31

Central Clearing and Settlement System (CCASS) ........................................................................ 32
Overview of CCASS Operation ........................................................ 32
Advantages of CCASS ..................................................................... 34
Minimizing the need for physical delivery of share certificates .......................................................... 34
Eliminate the chance of losing scrips ................................................ 34
Extended settlement period .............................................................. 34
Minimizing counterparty risk .......................................................... 35
Enhancing market development ...................................................... 35
Ability to handle huge amount of daily turnover ............................................................................... 36

Implications .................................................................................. 36
System Design .............................................................................. 36
Managing of Conflicts of Interest ..................................................... 40
Registrars ..................................................................................... 40
Brokers ......................................................................................... 41
Custodians .................................................................................... 43

CONCLUSION ............................................................................. 44

The Role of Government in the Development of CCASS ......................................................... 44
Current Task of SFC concerning CCASS .................................................................................. 49
The rapidly growing volume of international securities trading creates burden for the clearing and settlement systems for many national markets. As a consequence of the October crash in 1987, several parties (e.g. FIBV, G30) have proposed international standards of clearing and settlement system for solving issues inherent in domestic and international securities settlements. Furthermore, many countries (e.g. Singapore, Taiwan, Thailand, etc.) have made significant progresses in improving their clearing systems.

Being an important exchange in Asia, the Stock Exchange of Hong Kong has an urgent need to upgrade its traditional paper-based clearing system to a computerized central clearing and settlement system, which can fulfil four different objectives: i) rebuilding a good image of SEHK to foreign investors as an efficient market; ii) coping with the competition from other markets trading in Hong Kong listed securities; iii) coping with competition from other Asian stock markets; iv) becoming a regional exchange in the long run.

From the development of Central Clearing And Settlement System (CCASS) in Hong Kong, we conclude that establishing such a system will involve three different types of issues: i) system design; ii) managing conflicts of interest; iii) legal protection for the clearing.
Legal issues related to CCASS is very complicated and will not be covered in this paper.

Concerning the system design aspect, although CCASS is not the perfect or the most advanced system in the region, it is still an acceptable system which can greatly improve the settlement efficiency and reduce settlement risk. Registrars, brokers and custodians all have different vested interest in the settlement system. A great deal of time have been devoted to search for acceptable solutions among various parties.

Finally, as optimizing the benefits of investors rather than the interest of intermediaries is the ultimate goal of a market, the Hong Kong government and the Securities and Futures Commission should play a more active role in the time being to represent the interest of investors, to ensure that the CCASS will be adopted by a significant portion of market participants and to make the Hong Kong securities market to proceed towards dematerialization of scrips.
LIST OF TABLES

TABLE 1 Summary of Clearing and Settlement Standards Proposed by Various Parties

TABLE 2 Comparison of Clearing and Settlement System in Asian Countries

TABLE 3 Lists of Major Events concerning CCASS

ANNEX - ITEM 1 Overview of CCASS Operations

ANNEX - ITEM 2 Overview of Risk Management Measures of CCASS

ANNEX - ITEM 3 CCASS Processing Schedule

ANNEX - ITEM 4 Tariff Structure Under CCASS

ANNEX - ITEM 5 Interviews
ACKNOWLEDGEMENTS

Completing this project is by no means my efforts only, I have received immense help from many knowledgeable and respectable people.

My appreciation and thanks are due to Mr. Albert Tam of Fair Eagle Ltd., Miss Jessica Chan (Officer of Corporate Communication Division of HKSCC), Mr. Chan and Mr. Sin. They provided time for the interviews that give the the real value of this project. I am most grateful both for their time and for their insights.

I also wish to thank Shuh-Tzy Hsu, Deputy Director, Research Department of Taiwan Stock Exchange and Mrs Patricia Lim, Research Officer of Stock Exchange of Singapore Ltd, for the information about the central clearing systems of their respective exchanges.

Lastly, but not the least, I especially acknowledge my adviser, Dr. Patrick Lau for his sincere help in this project and his reviewing of my manuscript.
CHAPTER I

INTRODUCTION

Internationalization of Securities Markets

The international trading of corporate securities has been blooming in the past decade. In just several years, the volume of this international trade has increased tenfold. The massive international securities trading have been driven by a number of factors as follows:

Institutional Investors

Institutional investors (i.e. pension funds, unit trust/ mutual funds, corporate investors etc.) are playing an important role in many major exchanges. Hong Kong is Asia’s largest offshore center for fund management: management of institutional funds such as unit trust funds is a major activity.

The total amount of money controlled by institutional investors increase constantly. With a large sum of capital at their disposal, institutional investors become dominant players in many national markets. Institutional investors invest their money internationally to take advantage of the differentials in rates of

---

return among different markets and also to gain the benefits of international diversification.

Technological Developments

The developments of communication technology enhance securities trading in overseas markets as the investors can communicate with overseas brokers more efficiently in making informed investment decision. The technological improvements also help the investors to transmit the funds electronically all over the world. Therefore, it is possible for the international investors to spot profitable opportunities in a global dimension.

Modern information technology has triggered a process of dramatic changes of the securities markets. More efficient trading systems will boost the trading volume and hence create burden for inefficient clearing and settlement system.

Growth Opportunities in Developing Countries

Investors' capital will flow to areas where the most promising returns for investment can be generated. For example, given the advantages of low labour cost and land cost, Asian countries are producing an significant portion of manufactured goods for USA and European markets, generating large amount of export revenue. The economic bloom of Asian countries due to export surpluses in turn attracts a lot of foreign investment.

---

Economic growth also generates the demand and supply of financial services. With the growth of the economy, a country has to develop its financial market and financial services industry to support further economic growth. The growth of the financial services industry will in turn enhance the ability of the financial market to interact with other mature markets.\(^4\) The process is evident in major business centers around the world. For example, the economic success of Hong Kong due to manufacturing has contributed to attract foreign investment and also make Hong Kong an international financial center.

\textit{Deregulation of financial markets}

In recent years, deregulation has been a major trend for many financial markets all over the world. For example, the Korean policymakers realized that it is important to let foreign investors to come in order to maintain open markets for its goods and direct investments in overseas markets.\(^5\) The Ministry of Finance of Korea in 1988 announced plans for gradual liberalization over the period 1989-1992. On December 1990, the ROC (Republic of China) Executive Yuan promulgated the regulations for investments in securities by overseas Chinese and foreign nationals, permitting foreign institutional investors to invest directly in Taiwan securities. The ROC government considers that opening its securities market to large foreign institutional investors will make the domestic market become

\(^4\) same as above.
more mature and help to develop local expertise. Deregulation stimulates cross-border capital flows and hence intensifies the international involvement in securities markets.

The Stock Exchange of Hong Kong is already an international market with a lot of multinational brokerage firms participating in the local securities market. Although no data is available concerning the extent of involvement of international investors in Hong Kong securities market, it is believed that they account for at least half of the daily turnover. The blooming of international securities trading stimulates both changes in the internal environment and also competitive environment of the Hong Kong securities market. As a result, it is essential for Hong Kong to develop the securities market in a way that conforms to the international standards. Central clearing and settlement is a major trend for securities markets all over the world.

Central Clearing and Settlement in Hong Kong

The idea of central clearing and settlement was first proposed by Hongkong Bank in 1983. However, the Stock Exchange of Hong Kong and the Hong Kong government were not aware of the urgent need for such a system until the October stock market crash of 1987. A few months after the crash, an ad hoc project team was appointed by the Exchange to study the development of central clearing and settlement system. The report of Securities Committee Review published in May 1988

pinpointed the settlement issues and recommended that a central clearing and settlement system must be introduced. Having gone through a time consuming process for designing a system which can cater for the needs of various participants, the Central Clearing And Settlement System (CCASS) is going to launch in June 1992.

**Objective of Study**

An efficient and reliable clearing and settlement system is essential for both satisfying the domestic settlement needs and maintaining the Stock Exchange of Hong Kong as an important exchange in Asia.

In this paper, the development of central clearing settlement will be examined from both the international perspective and domestic perspective. By reviewing the world wide trend in development of clearing and settlement system, the importance of CCASS for Hong Kong stock market will be highlighted so as to identify the possible directions for future development of CCASS. Furthermore, by reviewing the development of CCASS in Hong Kong, the difficulties in developing such a system will be analyzed so as to identify some possible solutions.
CHAPTER II

METHODOLOGY

This paper aims at analyzing the significance and the difficulties in developing a central clearing and settlement system in Hong Kong. Therefore, the objective of this study is qualitative in nature. Quantitative analysis is not required.

Data Collection

This study required information about the world wide trend of development of clearing and settlement system and also the information about the development of CCASS in Hong Kong. The information concerning settlement systems in other markets and the international standards of securities clearing and settlement was collected from books and published periodicals. Information concerning the history of CCASS, its latest development and the issues related to CCASS was collected from newspaper, published periodicals and interviews with market participants.
Sampling

As three different parties will be involved in the daily operation of CCASS, i.e. Hong Kong Securities Clearing Company (HKSCC), brokers and custodians, interviews with people from these three parties were arranged. Furthermore, local brokers and international brokers have different concerns about CCASS, therefore, interviews with both a local broker and an international broker were arranged. Due to the limited time and manpower, only four interviews could be conducted: one with an officer of the corporate communication division of HKSCC, one with a medium size local broker, one with an operations manager of an international broker and one with an assistant manager of custodian operation of a custodian bank.
CHAPTER III

WORLD-WIDE TREND IN THE DEVELOPMENT OF CLEARING AND SETTLEMENT OF SECURITIES

October Stock Market Crash of 1987

The problems of international securities clearing and settlement were not fully recognized until the October stock market crash of 1987. The Review of Federal Reserve of Bank of Cleveland\(^7\) comments that

"The stock market crash of October 1987 highlighted the inefficiency, economic cost, and risk inherent in the current securities clearing settlements in international securities trading as well as domestic trading. Fully 40 per cent of all transactions failed to settle by the contract date at the time of crash."

Despite the crash, it is still expected that the volume of international securities trading will continue to expand. More standardized clearance and settlement procedures become essential for most of the national securities markets to minimize the risks inherent in international securities trading. In the meantime, each market has to operate under its own settlement procedures.

\(^7\) Review of Federal Reserve of Bank of Cleveland, 1990 April.
Current Trend in the Clearing and Settlement System

In recent years, there have been increasing attention and concerns about the settlements in securities trading. In many cases, efforts have been put on solving the settlement problems affecting the local investors and market participants. Nevertheless, it has also been recognized that, with the rapid increase in international capital flows, the settlement arrangements have to focus more on the needs of international securities settlement.\(^8\)

The two main objectives in recent reviews of settlement are: i) to enhance efficiency and lower costs; ii) to identify, and then either reduce or manage more efficiently, the risks inherent in the settlement process.\(^9\)

Four different parties have presented their views about the ideal settlement systems: International Society of Securities Administration (ISSA), Dr J.R. Kessler, Group of Thirty (a group of distinguished international financial officials, academics and practitioners), the Federation Internationale des Bourses de Valeurs (FIBV). Table 1 shows the recommendations suggested by these parities.

All four parties suggest that: i) settlement time should be no more than T+5 and more ideally T+3; ii) rolling netting settlement should be used; iii) each country should have a Central Securities Depository so as to immobilize the securities and realize the book-entry transfer of securities; vi) delivery and payment should

---

9 same as above.
happen simultaneously, i.e. Delivery versus Payment (PDV), to minimize credit risks; v) international communication standards should be adopted.

The recommendations by G-30 and FIVB have been adopted as the principle guidelines by the major exchanges and exchanges in emerging markets. However, different exchanges may need to cater to their specific needs and come up with somewhat different settlement procedures.\(^{10}\)

Currently, most of the national stock markets can not achieve all the recommendations set by G-30. The goal of cross-border trading in a real sense seems to be a very distant goal which is not likely to be accomplished in the near future, as different countries do have different regulations and procedures concerning the settlement process. However, some countries do have more profound progresses than the others in upgrading their clearing and settlement systems. For example, France, Germany, Spain and Denmark have immobilized the share trading by shifting to a fully electronic basis.\(^ {11}\) The Italian stock market is considering to change to more advanced system as it has been notorious for its inefficient settlement system, which may require even up to six to eight month to settle a deal\(^ {12}\). The paper-based settlement system (i.e. Talisman) of London stock exchange will be replaced by a new system, namely TAURUS, in 1993. TAURUS goes beyond the G-30 proposals in one key respect: stock certificates will be dematerialized, no physical stock certificates will be

---

\(^{10}\) same as above.


issued. Generally, the clearance and settlement systems in U.S. are considered to be quite efficient and reliable while sheeely diverse clearing and settlement system, ranging from the traditional paper-based system to advanced paperless system, are in use by different countries in Asia and Europe.

Development of the Clearing and Settlement Systems in Asian Countries.

A survey of Asian markets showed that the settlement systems employed could be broken down into three development stages: i) Introductory stage -- Indonesia, Philippines; ii) Development stage -- Hong Kong, Malaysia; iii) More Mature Stage -- Japan, Korea, Singapore, Taiwan, Thailand.

Many Asian countries have already adopted computerized central clearing systems which provide settlement services on a daily net basis or rolling net basis by book entry transfer to members' accounts.

Dematerialization is the ultimate goal for many of these systems, although some countries may be satisfied with immobilization of a large portion of scrips. Different countries have different schedules in immobilizing the stocks. For example, Singapore expects that it takes about two to three years to immobilize all the stocks on the main broad, whereas Japan expects that it takes a much loner period of 8 years to immobilize,

---

100% of the stocks by 2000. It is interesting that those countries with more active support and involvement by the government can implement the central clearing and settlement system in a shorter period. The emerging markets (e.g. Thailand) start from nothing to develop the settlement can adopt the most advanced system from the very beginning and skip all the development stages that the older markets have to go through, while the more mature markets like Japan and Hong Kong, the introduction of computerized central clearing system is going to affect many different vested interests and, therefore, have a very slow progress in improvement of settlement systems.

The Group of Thirty proposal suggests that all stock markets should have a central depository system in place by 1992. Most Asian countries except Indonesia and Philippines could meet this target. Right now, Singapore, Taiwan, Thailand, Korea, Japan have already adopted the computerized clearing and settlement systems. Malaysia are planning to implement central clearing system in July of 1992, just one month later than the scheduled date of launch of CCASS in Hong Kong. Even Jakarta exchange of Indonesia is planning to launch the state-of-art clearing system within one year, which may be so efficient as to settle the deals by the same trading day, i.e. T+0, according to the proposal suggested by Price Waterhouse.

---

16 Sargent, Sarah, "Settlement breaks new ground". *Asiamoney*, October 1991, p.34.
Implications for Hong Kong Stock Market

Hong Kong has been an important financial center in Asia. From the international perspective, the importance of the central clearing and settlement system to Hong Kong can be evaluated in four aspects: i) re-building a good image of Hong Kong stock market to the foreign investors; ii) competition from other markets in trading Hong Kong listed stocks; iii) competition from other Asian markets; iv) prerequisite to becoming a regional stock market in long run.

Rebuilding of a Good Image as an Efficient Market

The four days closure of the Stock Exchange of Hong Kong during the October crash of 1987 due to the inability of the Exchange to handle the paper crunch do hurt the image of the Hong Kong stock market as a well developed market. A lot of foreign investors lost money due to the inefficiency of the clearing system. There were a great deal of complaints concerning the settlement system and the management of the Stock Exchange of Hong Kong. Many foreign articles have cited the settlement system in Hong Kong as an example of inefficiency. Therefore, both the Hong Kong government and the Exchange realize that there is an urgent need to upgrade the system to a more efficient one.
Competition from Other Markets Trading Hong Kong Listed Stocks

If a stock can be traded in several exchanges, it is expected that the exchange with the greatest efficiency and lowest transaction cost will attract most of the trading volume for the stock. Therefore, advanced clearing and settlement system is important in the sense that it helps to improve the efficiency of the market and also lower the transaction costs.

For the trading of Hong Kong listed stock, the Stock Exchange of Hong Kong is facing several different competitors: i) SEAQ international of London Stock Exchange -- all SEHK listed issues can be traded in SEAQ; ii) CLOB International of Singapore -- Singapore creates the CLOB broad and provides generous incentives for Hong Kong company to be listed in Singapore. For example, Golden Peak (GP) is listed in Singapore; iii) Australian Stock Exchange -- only 4 Hong Kong listed blue chips can be traded; iv) American Depository Receipts (ADRS) -- 35 Hong Kong listed stocks can be traded in United States.17

Currently, over 82% of trades for Hong Kong listed stocks are carried out in the Stock Exchange of Hong Kong. SEAQ is the major competitor who captures about 17% share. The remaining three markets account for only less than 1% share.18 Although scripless system is used in CLOB, the liquidity for Hong Kong listed stocks in CLOB is low.

Some people are concerned that when TAURUS is in operation next year, SEAQ will attract even more trading volume.

18 same as above.
away from Hong Kong as the settlement efficiency can be increased and the transaction costs can be reduced in the long run with TAURUS.

The transaction cost for trading securities in Hong Kong amount to only 0.5% of the value of the transaction, including both the brokerage commission of 0.25% and the stamp duty of 0.25%, and is relatively low compared with other markets.\(^\text{19}\) The launch of TUARUS will attract significant trading volume from SEHK to SEAQ only if Hong Kong cannot introduce CCASS in time.

However, the simultaneous improvements of clearing systems in both SEHK and SEAQ can possibly stimulate round the clock trading and boost trading volume in each market.\(^\text{20}\) Efficient clearing and settlement systems in both markets enable international investors to spot arbitrage opportunities on a 24 hour basis without being exposed to significant settlement risks.

**Competition from Other Asian Stock Markets**

The exchanges in the region realize that they are all competing for the same international investor money. They are competing in two ways: i) more efficient systems to facilitate trading and clearing of a transaction; ii) deregulation. They also know that fund managers will be kept away from the markets which are operated with inefficient settlement system causing potential risks and loss due to failure of trades and loss of scrips. Furthermore, as the Asian stock markets have grown significantly

---

\(^{19}\) From interview two, please refer to annex-item 5.
\(^{20}\) same as above.
over the past few years, all exchanges experienced capacity constraints in settlement system.\textsuperscript{21} Therefore, many of the exchanges have made great progresses in improving their clearing and settlement system over the past two years.

An efficient trading and settlement system can significantly reduce the settlement risks for the international investors but may not attract international money.\textsuperscript{22} Investors are mainly attracted by the monetary returns provided by the markets.

Even though there have been wide spread attempts for liberalization of financial markets in Asian countries like Korea, Taiwan, Malaysia, Thailand and Indonesia, these emerging markets are not likely to attract much international investors' money away from Hong Kong in the short run either because the policymakers of these countries do not want to fully open their markets at the present moment or because the liquidity in these markets are currently low. For example, although the foreign investors complaint that the settlement period of the new paperless settlement system of Taiwan Stock Exchange (TSE) is too short that they are prevented from doing trades,\textsuperscript{23} the Taiwan Stock Exchange (TSE) does not intend to extend the settlement period as foreign investors are the minority investors in the Taiwan stock market, owning only 1% of the shares of the market.

A lot of Asian countries have very promising growth opportunities and many of them have been equipped with efficient trading and settlement system. Once these countries further open their markets to the international investors and are

\textsuperscript{21} Sargent, Sarah, "Settlement breaks new ground". \textit{Asiamoney}, October 1991, p.34.
\textsuperscript{22} From interview three, please refer to annex-item 5.
\textsuperscript{23} Foster, Angus, "Speed up or be banned", \textit{Asiamoney}, March 1991, p. 29-33.
successful in developing more mature markets, they may be even effective than Hong Kong in attracting international money in the long run.

Therefore, the continuous improvements of clearance and settlement systems in these markets are putting pressure for Hong Kong to make corresponding improvements.

**Prerequisite to Becoming a Regional Exchange in Long Run**

Many countries (e.g. Singapore, Thailand and Hong Kong) in the region aim at establishing regional exchanges in their own markets. With the sheer diversity in regulations and settlement systems across different countries in the region, cross-border trades in a real sense are not likely to happen in the near future. Therefore, it is currently not possible to have a regional exchange which can access to all the national exchanges in the region and provide the most efficient trading and settlement facilities at the lowest transaction costs so as to attract trading on all major stocks listed in the countries of the region.

In the long run, the technological advances and the continuous changes in the regulations of different countries will make truly global securities trading viable, exchanges will then be forced to compete with costs. An efficient clearing and settlement is certainly one of the important prerequisites to becoming a regional exchange.
Possible Directions for the Future Development of Central Clearing and Settlement System in Hong Kong

In order to rebuild a good image for the Hong Kong stock market, it is essential to introduce a central clearing and settlement system which confirms to the international standards and also is reliable and efficient in terms of the system design. The proposed central clearing and settlement system (CCASS) will be discussed in more details in the next section. Basically, CCASS is expected to be able to achieve this objective.

Hong Kong is strategically located at the center of the North East-Asia, one of the most rapidly growing areas in the world. Therefore, Hong Kong is at a good position to promote herself as the most important financial center in the region. The development of CCASS in Hong Kong should also fulfill the needs of Hong Kong stock market in this aspect. To further internationalize the Hong Kong stock market, more efficient and convenient ways should be available for the international investors to access to the market. CCASS can improve the efficiency of the market and reduce the settlement risks that the international investors may encounter. Furthermore, it can also provide more efficient ways for international investors to access to Hong Kong stock market in the long run. Three different alternatives are available:
Allowing the investors (especially the institutional investors) to be the direct participants of CCASS

Although it has been scheduled that investors will be participants of CCASS by 1993, HKSCC has not yet decided exactly how the investors will access to the CCASS. It is suggested that investors (especially institutional investors) should be given the alternatives of opening direct accounts with CCASS, or opening sub-accounts under broker participants or both. It may be costly for the investors to set up the computer facilities to access the CCASS. However, if those investors are very active in the market, it may be more economical and efficient for them to employ their own facilities.

Linking CCASS to the settlement systems of other national markets

CCASS can be first linked to other markets which are currently trading Hong Kong listed securities, e.g. SAEQ.24

The former chief executive of HKSCC and the existing chief executive of the Stock Exchange of Hong Kong, Paul Chow, have mentioned that CCASS will be linked to other exchanges in the future. The design of the CCASS have accommodated the required features for linking to other markets. However, HKSCC will look into this possibility after real time DVP and extending CCASS services to investors have achieved.

24 From interview two, please refer to annex-item 5.
Issuing global certificates with the consensus of the issuers of the stocks.

In U.S. the recent immobilization efforts have focused on the use of global certificates to eliminate distribution of securities to investors. Global certificates (or Global Depository Receipt, GDR) are single certificates reflecting an entire securities issue that is registered on the issuer's books and records in the nominee name of a clearing agency (i.e. CCASS) as the sole security holder of the issue. Owners of the issue must maintain accounts at the clearing agency, or the participants of the clearing agency.

As CCASS is still a new concept in Hong Kong, it takes time for both the investors and the issuers to accept CCASS and hence the concept of global certificates.

The first alternative is more likely to be achieved in the near future while it may take a long time to facilitate the remaining two alternatives. Currently, the policy of HKSCC is to cope with the changes in demand but not to initiate changes to create demand. However, as the worldwide securities markets are changing rapidly to reshape the competitive environment and international clearing houses such as Cedel and Euroclear are developing scripless market for international securities trading, HKSCC may have to adopt more proactive approach in the long term development of CCASS in order to cope with the changing environment.

History of CCASS

In 1983, the Hong Kong Bank proposed a computerized settlement-cum-depository system to the Committee of Unified Exchange. In 1984, the idea of central clearing in stock market was also proposed by an operation manager of the Far East stock exchange of Hong Kong but was not approved by the members. At that time, a centralized clearing system was not accepted for two reasons: i) the daily turnover of Hong Kong stock market was only HK$150 million, which was not large enough to support a costly but advanced centralized clearing system; ii) Computer was not popular at that time. It was a problem for the brokers, especially small brokers, to employ the settlement staff who had sufficient knowledge to operate the computerized system. As a result, no real progress had been made in upgrading the clearing and settlement system during the following a few years.

In 1987, the securities market was blooming and the trading volume in Hong Kong stock market was boosted to the capacity

27 From interview two, please refer to annex-item 5.
limit that could be handled by the back offices of the brokers. Serious settlements backlogs happened. Brokers increased their settlement staff by 2 to 4 times. Banks also doubled their staff. Excess overtime work was necessary for the settlement staff to settle the deals. However, no one really had time to care about how to upgrade the clearing and settlement system. The October crash was a great disaster for both the investors and brokers. The four days closure of the Stock Exchange of Hong Kong was partly due to the paper crunch built up by the extraordinary trading volume on the day of crash. Due to the settlements backlogs, brokers could not know their outstanding stock positions as they could not identify whether the trades were delayed or their clients defaulted. All market participants were exposed to significant settlement risks. Although only two small brokers subsequently defaulted, the October crash drew the public's concerns to the problems of the existing clearing system. The government then realized the urgency for the reform of the securities market in Hong Kong. An ad hoc committee, namely Securities Review Committee chaired by Ian Davison, was then appointed to review and investigate the securities industry of Hong Kong.

After the crash, brokers (especially the small brokers) were frustrated by the significantly declined trading volume and not interested in an expensive new clearing system. However, the Stock Exchange of Hong Kong did realized the need for such a

30 From interview two, please refer to annex-item 5.
system and established an ad hoc project team on central clearing and depository project in January of 1988. Furthermore, the Securities Review Committee published its report in May 1988, which laid down the basic directions and guidelines for future reform of Hong Kong stock market. The report pointed out that the settlement was one of the most important issues of the Hong Kong stock market. Therefore, the report proposed a central clearing and settlement system. At that time, the Exchange restructured its organization by adding a new compliance division and strengthening the operation division.

The Securities and Futures Commission was established in May 1989 as the main securities regulator, which was also responsible for foreseeing the development of clearing and settlement system in Hong Kong. The establishment of the Hong Kong Securities Clearing Company (HKSCC) indicated the determination of the Exchange to introduce a central clearing and settlement system but also began a time consuming process to resolve the conflicts of interest of various market participants involved in the central clearing and settlement system. The first consultative paper by HKSCC was published and distributed to the members of the Exchange in October of 1989. It was expected that the facility for centralized net physical settlement would be completed by September 30, 1990 with the final system fully operational by Jun 30, 1991.\footnote{Chan, K.W. * A Central Clearing and Depository System for HK*. The Securities Bulletin (Oct 1988): 29.} However, there were many issues that must be sorted out and the needs of a number of parties — brokers, registrars, custodian banks, investors must be catered
for. Three additional consultative papers had been issued during July 1990 to March 1991. The following issues, for example, had been raised during the development of the Central Clearing And Settlement System (CCASS) : i) how to prevent HKSCC from committing the same mistake that the Future Exchange did in October crash when the Future Exchange could not fulfil its obligation as a central guarantor; ii) whether the optimal settlement period should be T+1, T+3 or T+5; iii) how the changes in registration process under CCASS would affect the ownership of shares; vi) how much guarantee fund should be contributed by the brokers; vi) how to finance the CCASS project, etc.. In the mean time, international brokers were disappointed about the slow progress in the development of CCASS and hence tried to settle their deals in a more efficient way. There were only about thirty international brokers in Hong Kong. Each of them had both custody account and checking account in the Hong Kong Bank. Therefore, Hong Kong Bank could act as their clearing center in which the deals among themselves could be settled without physical transfers of share certificates.32

With the great effort made by HKSCC to get the compromises from various parties and the demand by SFC for the CCASS, the system design of CCASS was finally completed in the middle of 1991. The report on system design was then published In June 1991. The CCASS was scheduled to launch on Dec 18, 1991.

Unfortunately, as the concept of central clearing (especially the netting settlement) was new to the newly elected members of the Legislative Council, the required changes in the legislation for

32 From interview two, please refer to annex-item 5.
CCASS were not approved by the Council. Furthermore, SFC disagreed with the risk management arrangements for CCASS and also requested HKSCC to change the composition of its board of directors.\textsuperscript{33} As a result, the target launch date of CCASS was postponed.

Now, in order to put the system in operation as soon as possible, the HKSCC decides to launch the CCASS in two phases: trades for trades settlement in phase one; netting settlement in phase two. It is expected that CCASS can be in operation with trade for trade settlement in early June. The continuous netting settlement system will be used once the required legislative changes are approved by the Legislative Council.

\section*{Current Issues}

\subsection*{Cost Issue}

Despite HKSCC's efforts in satisfying the request of market participants, some market participants still have some concerns about the CCASS based on interviews with a few market participants. The most predominant issue, from the participant's perspective, seems to be the services tariff structure of CCASS.

Some international brokers consider that the charges for the settlement services provided by CCASS are too expensive.\textsuperscript{34} Since the costs for setting the computer facilities to access to CCASS, the charges for CCASS services and admission fee for CCASS are

\textsuperscript{33} Hong Kong Economic Journal, 1 February 1992.
\textsuperscript{34} From interview two, please refer to annex-item 5.
additional costs for them, they are considering either requesting HKSCC to reduce the charges or increasing the broker's commission fees. Furthermore, they also consider that they can settle the deals among international brokers by using Hongkong Bank as a clearing center as they did before.

It is expected that the higher than expected charges of CCASS services are due to the amortization of the development cost of CCASS over the past few years. The development cost of CCASS will be amortized over seven years, assuming that the daily turnover is HK$ 150 million.

From the interviews with market participants, it was found that both large brokers and small brokers expect that the operation costs will be increased rather than decreased after the launch of CCASS. They probably have to employ extra staff to operate the new computer system for accessing to the CCASS. They have to pay for the broker's indemnity scheme, bank guarantee for money settlement. Since only some of the stocks will be immobilized in the initial period, they may not be able to reduce their settlement staff at least in the short run.

From interviews with a medium size local broker and an international broker, it was found that the local broker did not have much concern about the additional costs imposed by the use of CCASS but the international broker did have concern. The international broker may think that less costly but still efficient way to settle deals is available among international brokers while the local broker may think that it is worth paying more to minimize the counterparty risks.

35 From interviews one and two, please refer to annex-item 5.
Certainly, 5.6% of brokerage commission may represent a significant portion of brokers' profits. Those brokers who are currently earning thin profits may have problems in absorbing the clearing fee. Therefore, it is expected that the brokerage commission fee will be eventually increased so as to absorb the clearing fee, even though some brokers are worried whether their customers will accept such an increase.

Furthermore, HKSCC is considering to lower the charges for its settlement services by 30% if an alternative amortization schedule is accepted by the board of directors and the creditors of HKSCC. In the new amortization schedule, the development cost of CCASS will be amortized over ten years, assuming that the daily turnover is HK$ 180 million.

As custodians do not perceived themselves as the direct beneficiaries of the new clearing system. It is reasonable to see that they complaint about the charges related to custodian services provided by CCASS. A custodian bank expects that the use of CCASS will increase its expenses by 40%.

*Legislation Issues*

At this stage, HKSCC is seeking statutory provisions to protect the clearing system and its operational integrity. Although the legislation for protecting HKSCC in the event of a participant's insolvency was published in Gazette in February of 1992, the Law society of Hong Kong and the Accountant Society of Hong Kong argue that the legislation concerning this aspect violates the
Insolvency Law. It is still uncertain whether there will be changes to legislation concerning this issue.

**Current Clearing and Settlement System**

*How a Trade is Settled*

After a deal is executed, that means, both the seller and buyer agree on the deal, a series of steps will be carried out in order to settle the deal.

The first step in the settlement process is comparison (or matching) which is the verification or confirmation of the terms of a deal, ensuring that both the seller and buyer parities are trading with each other on the same terms. If some of the terms are unmatched, corrected information should be resubmitted for matching or the deal can be cancelled with the consensus of both parities. Matching may be undertaken bilaterally (e.g. over the phone) or by a central agency. The second step is clearing which is the process of accounting for the deals in preparation for settlement of payment and securities delivery obligations. The third step is settlement which is the delivery of securities by the seller and the payment of the securities by the buyer.36

Currently, a deal has to be settled within 24 hours of the transactions according to the regulations of Stock Exchange of Hong Kong. Each deal must be settled by 3.45 p.m. on the following day after the deal. That means a selling broker acting as

---

an agent of his customer has to finish the whole settlement process in 24 hours. To settle a deal, the seller has to deliver his share certificates physically to his broker. The shares certificates will then be counted, booked in and out, stamped, batched against a delivery note. The deal is settled when the share certificates are delivered to the buyer in exchange for the receipt of cheques or transfer of funds through bank accounts. On the buyer side, the above procedure is reversed. The buying broker will issue cheques or transfer funds through bank accounts against receipt of the share certificates. However, the order from the customer may be so large that the buying broker has to buy the same stock from a number of selling brokers (say 10 different brokers), then settlement problem may arise if one of the selling brokers fail to deliver the share certificates before the deadline of the settlement period. In this case, the buying broker will bear the interest cost of the cheques issued or funds transferred until the deal is settled.

Now suppose broker B only serve as an middleman who buy 1000 shares of ABC Co. from broker A and then sell the 1000 shares to broker C in the same trading day. Under the present settlement system, the share certificates has to be physically delivered by broker A to broker B in exchange of the cheque issued by broker B. Then broker B will physically deliver the share certificates to broker C in exchange for the receipt of cheque issued by broker C. However, if any one of these three parties fail to fulfill his own obligation, the settlement for these two deals will be delayed and the other two parties will be exposed to unnecessary risks.
Issues of the Existing System

Too short settlement

As mentioned above, the settlement process is basically a manual system that involves a number of time-consuming steps and a lot of paper documents. It was an efficient system in the past because the trading volume was not large.\(^{37}\)

As the trading volume has been increasing year after year, partly because of the involvement of international investors, the existing manual clearing and settlement is becoming unable to handle the increased volume. According to the SEHK's record, 69% of trades can be settled by T+1, 89% by T+2, 97% by T+3.\(^{38}\)

Therefore a good percent of trades cannot be settled in time.

Furthermore, T+1 settlement period is actually too short for international investors to facilitate effective and reliable communication with local partners so as to invest in the Hong Kong stock market, especially, when these investors are located in different time zones, supervised under different legal and regulatory jurisdictions, and possibly use different currencies.

Physical settlement

As we can see from above examples, the settlement process involves physical deliveries of share certificates from one place to another. If many different parties are involved in the same deal


(for example, a selling broker sells shares to many different selling brokers on behalf of his customer) or the parties involved are located far away from each other, the travel time and time required for handling share certificates will be enormous and result in delays in settlement.

**Exposures to counterparty risk**

Presently, the brokers are exposed to significant counterparty risks. Each time a securities transaction occurs, the broker parties to the trade must make a case-by-case credit assessment of the counterparty.

**Chain reaction of settlement risks**

If the shares change hands several times on the same day, any delay on the part of one party will cause a chain reaction of delays to the subsequent parties. Similarly, if any one party defaults, all the subsequent parties are exposed to potential loss.

**Risks for loss of scrips**

For example, in the Lo and Lo case, Shares are stolen and traded in the market. The result was that brokers suffered losses.\(^{40}\)


\(^{40}\) "Without Favour or Fear". *Securities Journal* (Nov 1990).
Central Clearing and Settlement System (CCASS)

Overview of CCASS Operation

CCASS is a depository system in which settlement of transactions in SEHK listed securities between CCASS participants (including brokers, custodians, stock lenders and stock pledgees) can be effected by book-entry. Securities deposited by a participant into the system will be reflected in the stock accounts in CCASS designated by the participant. Investors are not direct participants to the system, they must deposit their shares into the system through brokers or custodians. It is a two-tier system in which a market participant (i.e. a broker or a custodian) will serve as a mini-clearing house to handle the settlements between its clients and itself while the HKSCC will serve as a clearing house for transactions between participants. Securities under the CCASS will be treated fungible, that means, these securities will be registered with CCASS as the common nominee and can not be identified for particular participants or transactions.

Although SEHK is planning to change the regulation and make it an obligation for all broker members of the exchange to be the participants of the CCASS, it is not compulsory for the participants to deposit shares in the CCASS Depository. Shares can be moved in or out of CCASS depending on the decisions of the shareholders.

The settlement period of T+1 will be extended to T+2 after the launch of CCASS. The system will be launched in two phases. In the first phase, the clearing and settlement services will be
provided on a trade-for-trade basis in which settlement is effected directly between the trading counterparty broker participants. In the second phase, the continuous netting settlement (CNS) will be launched. HKSCC will become the settlement counterparty and settlement will be effected between broker participants and HKSCC. Therefore, the selling broker and buying broker of the same transaction will settle the deal with HKSCC respectively. In the second phase, brokers' trades on SEHK listed securities could be settled in CCASS either through continuous netting system (CNS) or isolated trades system (i.e. trade-for-trade settlement).

Besides clearing and settlement services, CCASS also provides other services. The CCASS Depository can act as a centralized custodian who provides common nominee services. Furthermore, CCASS will provide electronic money settlement services, issuing payment instructions.

As a lot of important information will be stored and processed in the computer system, there will be two back-up systems for preventing system failure.

Stocks will be immobilized in four phases. The most active traded blue chips will be accepted by the Depository from the very beginning. It is expected that it takes about 52 weeks for Depository to accept all Hong Kong listed stocks to be eligible stocks to be deposited in CCASS Depository. It is expected that about 40% of the stock certificates of all stocks in Hong Kong will be deposited in CCASS Depository by the end of first year of operation of CCASS.
Advantages of CCASS

Minimizing the need for physical delivery of share certificates

Central securities depository enable the transfer of securities inside the CCASS to be effected by crediting the buyer's account and debiting the seller's account.

Continuous netting settlement, where all trades in a particular stock plus failed trades are continuously netted to a final long or short position, greatly simplifies the settlement procedures for brokers who trade actively on the same stocks in the same day.

Eliminate the chance of losing scrips

The problems with losing scrips or defective scrips can be minimized and managed properly.

Extended settlement period

Extended settlement period give more time for the international investors to settle their deals. Although T+2 is a tight limit for international investors, it is still possible to settle the deals in time if the brokers are doing their jobs properly.

42 From interview two, please refer to annex-item 5.
Minimizing counterparty risk

Two main types of counterparty risk are involved in the settlement process i.e. capital risk and market risk. Capital risk is the risk that the counterparty defaults during the processes of exchanging securities for money, so that the other counterparty delivers security without receiving money, or vice versa. Market risk is the possibility of a deal having to be replaced at a different price because one or other counterparty fails before the exchange of securities for money take place. When a broker-to-broker trade is settled on continuous netting settlement basis, HKSCC acts as the counterparty for both the seller broker and the buyer broker and hence minimize the counterparty risk of the brokers.

Enhancing market development

The current trading system gives no priority to orders at same price and the two trading counterparties in the exchange floor may sometimes be required to contact face to face so as to execute the order. Automated trading is a much more efficient trading system in the sense that it provides auto-matching and hence is expected to boost the trading volume.

The introduction of central clearing and settlement system does not immediately boost the trading volume but makes way for the introduction of automated trading system and the creation of an options market.

---

Ability to handle huge amount of daily turnover

It is expected that CCASS can handle daily turnover up to HK$ 5 to 8 billion without significant increase in manpower and cost.

Implications

From the development of CCASS, we conclude that developing a central clearing and settlement system will involve three types of issues: i) system design issues concerning design of computer network and settlement procedures to ensure efficiency and risk management for the system; ii) issue on managing conflicts of interest; iii) issues for acquiring legal protection for the system and legislative changes to facilitate the clearing system and improve the efficiency of its operation. These three types of issues are not independent but, to a certain extent, inter-relate with each other. The legal issues related to CCASS are quite complicated and so go beyond the scope of this paper.

System Design

G-30 has already laid down the principles for an efficient and reliable clearing and settlement system. Therefore, the system design of CCASS can be evaluated based on the G-30 recommendations. CCASS has achieved the following G-30 recommendations: i) comparisons of trades by T+1; ii)
establishment of CCASS Depository to effect book-entry transfer of shares; iii) continuous netting system, which will be launched in the second phase of CCASS; iv) delivery versus payment (DVP), however, with a time lag of half day; v) rolling settlement with T+2; vi) securities lending and borrowing.

The recommendations that CCASS has not yet achieved include: i) allowing indirect market participants (such as institutional investors and non-broker counterparties) to access to the trade comparison system so as to achieve positive affirmation of trade details; ii) payments in "same day" funds; iii) applying international communication standards for securities messages.

Basically, CCASS has achieved all the important steps for guaranteeing an efficient clearing and settlement system. It should not be an issue that CCASS employs settlement period of T+2 rather than T+3 suggested by G-30. Unfortunately, settlement on a netting basis can not be employed without the approval of Legislative Council. The netting settlement is important in the sense that it greatly reduces the counterparty risk of the brokers with HKSCC as the central risk taker. Without netting settlement, the use of CCASS still can improve the settlement efficiency greatly and hence improve the risk management to a certain extent. Another issue of CCASS is a lack of real time DVP which is expected to be achieved in 1993. In the mean time, HKSCC will be exposed to some additional risk.

HKSCC considers that as many investors (including small investors) currently deposit their shares in the brokers with their shares registered under the brokers' name or street name, it will not be a problem for brokers to act as mini-clearing houses in the
new system and issue the shares receipts to the investors. However, it may be sometimes possible for a few immoral brokers or some immoral staff of the brokers to issue unreliable receipts to cheat their customers when their customers adopt paperless settlement. Therefore, the protection for the settlements between participants and their customers should be strengthened later.

By adopting the recommendations by G-30, CCASS can reduce the settlement risk for a great deal by improving the settlement efficiency. Furthermore, there is a risk management guarantee system to monitor and control HKSCC’s risk as the central risk taker to all broker to broker trades locked in the CCASS and settled on CNS basis. The pending CNS positions of a broker will be marked to market every day. Whenever, the daily aggregate value of a brokers' CNS trades exceeds his settlement cap which is equal to eight times a broker's net capital, he is required to pay net unfavorable marks on the day's CNS trades.45

If a broker defaults, full compensation will be paid in respects of a broker’s continuous netting settlement (CNS) trades by the Guarantee Fund and a limited compensation of not more than HK$8 million per seat held by the defaulting broker will be given for all broker to broker trades settled on trade for trade (TFT) basis.46 Temporarily, the compensation for trades settled on TFT basis will be provided by the Fidelity Fund of the SEHK until the netting settlement service is launched.

46 same as above.
Besides the Guarantee Fund of HK$ 200 million contributed by brokers to guarantee the broker to broker trades which have been locked in CCASS, there are three additional indemnity schemes: i) Professional indemnity insurance for brokers provides some protection in cases where innocent brokers find scrips that they have been trading to be defective or their staff have committed commercial crimes; ii) Insurance purchased by the custodians; vi) Insurance purchased by HKSCC to provide protection in cases where HKSCC finds that it has received defective scrips or is exposed to losses due to commercial and computer crimes. Therefore, there are already sufficient measures and funds for risk management.

CCASS is similar to JASDEC in Japan in the sense that both are two tier systems with no mandatory participation. However, CCASS is better than JASDEC in some respects: For JASDEC, money settlement is not covered; multiple cash settlement agents are involved; phone confirmation is required prior to delivery.47

However, the Central Depository in Singapore seems to be more advanced than CCASS in the sense that it allows the investors to open direct accounts with the CDP or indirect accounts through the brokers or custodians and that there is a linkage between Japan Securities Clearing Corporation (JSCC) and CDP, enabling Singaporean investors to settle transactions in Japanese securities listed on the Singapore Stock Exchange (SES) by CDP book entry.48 Furthermore, SES is now in liaison with the ISIN (i.e. International Securities Identification Number) numbering agency.

---

47 Asian Finance, 15 November 1990.
for the standardization of international communication code. The ISIN number consists of a country code, a security's domestic code number, and a check digit to validate the code.

Therefore, CCASS is a reliable and acceptable system but not necessarily the most advanced system in the region. Immediate effort should be given to facilitate netting settlement and enforce real time DVP. Real time DVP is a very important step to minimize the capital risk and market risk for HKSCC. As real DVP requires the banks to increase their end-of-day settlement capability and some banks may have to invest in real-time payment system such as CHATS, it may still a time consuming process to gain the support from banks.

Managing of Conflicts of Interest

The introduction of Central Clearing and Settlement System will fundamentally change the way how a trade is done. As many different market participants are involved during a trade, such a change is going to affect various parties with vested interest.

Registrars

Under the new system, all participants in CCASS will appoint CCASS as the registered holder (i.e. common nominee) of all their shares under CCASS. The movement of shares within the system would not affect legal ownership of the shares. Therefore, registrars will not get any business for the ownership transfers of shares inside the CCASS. Unlike the situation of registrars in Korea
and Thailand where the registration is performed by the central clearing system, registrars in Hong Kong do not lose all their business after the launch of CCASS. The investors can only access to the CCASS through intermediaries like brokers and custodians. When the shareholders want to withdraw their shares from CCASS and register their shares under their own names they will still employ the services of registrars.

Brokers

Among registrars, custodian banks and brokers, only brokers have the incentives to promote a central clearing and settlement system as they can reduce their counterparty risks significantly under the new system. Therefore, brokers (including both local brokers and international brokers) are looking forward to the CCASS. The issue is only how the system should be designed to suit for the diverse needs for both the local small brokers and the international brokers.

Davison's report propose that the settlement period should be extended from T+1 to T+3, otherwise overseas investor will find it difficult to settle the deals in time. However, as the great majority of brokers in Hong Kong are small brokers who make deals with their customers on trust, they are concerned that extended settlement period will increase their risk exposure as it gives more time for their clients to change their minds and refuse to fulfill their obligations, especially when the stock prices are changing rapidly in a short period. Since a very significant portion

---

of customers of local small brokers are individual investors with various amounts of investment, it is difficult for the small brokers to access the financial positions of these customers. Unlike the small brokers, large brokers (especially international brokerages) serve mainly corporate accounts and institutional investors which will provide publicly available financial information for accessing their financial positions and also have lesser risk of default. As a compromise of the interest of the small local brokers and the brokers serving international clients, the settlement period for the CCASS will be T+2, i.e. in between T+1 favoured by local brokers and T+3 favoured by international brokers.

Small brokers are also concerned that the costs for building up computerized systems to interface with the CCASS will be a financial burden for them. Concerning this issue, CCASS has been designed in a way that a broker only has to install a PC to access to the CCASS. HKSCC also provides the required software at a reasonable price. It is expected that it will cost a broker HK$30000 - 40000 for installing the computer facilities to interface with CCASS.

Some small brokers worry that their clients (small investors) will still demand physical share certificates. In that case, the brokers are not going to realize significant cost savings expected from the use of computerized system because they still have to maintain intensive labour and office space to handle the settlement of physical certificates.
Custodians

Under the present physical delivery system, custodian revenue from handling shares, dividend collection and other charges are high. The bigger the trade, the greater the custodian's revenue. However, under the system of immobilizing share certificates, custodian will have to share their revenue in handling share certificates with the CCASS Depository. Actually, the CCASS Depository is like a centralized custodian which provides common nominee services for safe keeping of stocks, collection and distribution of dividends, etc.. The profits for custodian will be squeezed under the new system. The major concern for custodian is, therefore, the cost for using CCASS depository's services.

Furthermore, custodian will favour longer settlement period as their clients are mainly international investors.
CHAPTER FIVE

CONCLUSION

Technically, it is not be a difficult problem to establish the computerized facilities and the network to facilitate central clearing and settlement of securities. However, similar to the situations in U.K. and Japan, the introduction of central clearing and settlement system represents conflicts of interest among various parties. As the securities industry in Hong Kong has different characteristics from other markets, Hong Kong comes up with different solutions to the conflicts and hence somewhat different features for the CCASS.

The Role of Government in Development of CCASS

The Securities and Futures Commission emphasizes on the principle of self-regulation and has not followed its counterparts in Singapore or Thailand to impose changes in the securities market. The Stock Exchange of Hong Kong and later HKSCC have been given the full responsibility to design the central clearing and settlement system. As one of the major objectives of SEHK is "to maintain an appropriate balance between the interests of all participants within the securities industry so as to ensure an
efficient, effective, orderly and fair securities market", 50 it is not surprising that a lot of time and efforts have been used to solicit compromises among various participants on CCASS.

The benefits provided by CCASS are essentially long term benefits: enhance market efficiency, reduce settlement risks and reduce the transaction costs in the long run. Being worried about the costs of developing and establishing CCASS, people tend to overlook the costs for potential losses due to an inefficient clearing and settlement system when some serious settlement problems arise (e.g. during another stock crash), which may be even much more costly than the costs for developing an efficient system. Unfortunately, a lot of market participants may have too much concern about their own benefits and the tangible costs that they have to pay for a more efficient system. Furthermore, the use of a more efficient system is going to eliminate some jobs that are currently done by some intermediaries and the interest of these parties is hurt. Among various intermediaries, only brokers have strong incentives to promote the central and clearing system, even though some of them also are concerned about the costs for such a system. As a result, the progress on the development of CCASS have been slow over the past years.

The primary goal of a market is to provide a place for both the seller and buyer to do business with each other at the lowest transaction costs and smallest risk. Therefore, for a stock market, optimizing the benefits of the investors (i.e. the buyers and the sellers) should be the top priority. In an ideal world, the seller

and the buyer can make deals with each other without any settlement risks and transaction costs. However, in reality, a market structure consisting of various types of intermediaries exists to facilitate the transactions between a seller and a buyer so as to minimize the settlement risks and transaction costs inherent in transactions. Therefore, the benefits of intermediaries should also be considered in the sense that they should be given sufficient incentives (i.e. profits) for facilitating transactions. If any type of intermediaries is severely hurt, the market structure may be disrupted and can not function properly. However, as optimizing the benefits of the investors is the ultimate goal, changes which are favorable to the investors should be introduced even at the expense of the benefits of the intermediaries. The question is only how to initiate the changes in such a way that they will not bring disastrous impacts to all intermediaries and disrupt the market structure. With the rapid technological advances taking place and the rapidly changing economic and political environments, a securities market should change continuously to accommodate these changes. It is expected that more and more jobs of the intermediaries can be replaced by centralized computer system. Some types of intermediaries may even eventually disappear in the future. Since this is an inevitable trend, what the intermediaries can do is not to try to maintain the existing situation but to look forward to opportunities for providing added values for their services. The introduction of more efficient system may even mean opportunities for the intermediaries who can continuously upgrade their own facilities.

51 please refer to Internationalization of Securities Markets in Chapter I.
and provide innovative products so as to succeed in an increasingly competitive environment.

In the situation of Hong Kong stock market, the government and the governing body of the securities industry should play a very important role to promote the central clearing and settlement system. It is doubtful whether the project of CCASS could have achieved the launch stage if the Securities and Futures Commission had not given strong support for the project. The board of directors of the Stock Exchange of Hong Kong mainly consists of brokers' representatives and so may be more or less biased to the interest of brokers. The purpose of the consultative papers concerning CCASS is to invite the opinions from the market participants (i.e. brokers, registrars, and custodian banks). As a result, it is the responsibility of the government to represent the interest of the investors.

Looking at what were proposed by the first consultative paper published in Oct 1988, it is found that the design of CCASS do not deviate very much from the basic design proposed in the first consultative paper: a two tier system which will accommodate two types of participants (i.e. brokers and custodians). Investors, including individual and institutional investors, will have to clear and settle through brokers or custodians. In principle, all ordinary shares and warrants listed in the Exchange will be eligible in the system. Shares must be first deposited into the system with settlement being done through book-entry. Investors are allowed to withdraw shares from the

---

system through their brokers or custodians in the form of physical certificates. Broker to broker transactions settled on a net basis will be locked in the system and guaranteed by HKSCC. Broker to custodian transactions will be done on trade for trade basis without settlement guarantee from HKSCC.

The major differences between the two design seems to be the following: i) settlement period and the schedule of settlement operation: the original design proposed settlement period of T+5 while CCASS employs settlement period of T+2; ii) information reporting: the original design proposed the concept of declared shares account to reveal share holding information for both the investors and the issuers while CCASS abandons this concept but provides Segregated Accounts for brokers. Furthermore, the original design did not cover very much about the registration under the proposed system and the guarantee system.

A lot of time may have been used to accommodate some controversial issues concerning CCASS as many important features of CCASS were already proposed in Oct 1988. The original target date of launch of the system was April 1990. However, the design system could not be finalized until May 1991.

Definitely, CCASS is such an important system that we must make sure every thing is right with the design of the system. Otherwise, both the investors and the market participants will be hurt. Moreover, CCASS is also a very complicated system that affect every aspect concerning securities settlements. Is it possible to design a perfect system without testing it in the real situation? Some issues (e.g. settlement period) can sometimes be very controversial and consume a lot of time for reaching compromises.
Different parties may insist on their own views. Nevertheless, no one can know exactly what will actually happen after the system is in operation. It is expected that there may be a learning period for such a system. Possibly, some minor issues will be discovered after the CCASS is operational. These issues should be rectified promptly. Therefore, it is expected that more active governmental involvement could have speeded up the development of CCASS without sacrificing much of the ability of the system to cater to the needs of various parities.

**Current Task of SFC concerning CCASS**

The use of central clearing and settlement system is an inevitable trend in world wide securities market. During the development of CCASS, a lot of time has been devoted to solicit the opinions from the market participants and so CCASS should be expected to fulfil the needs of most participants. CCASS is expected to be an acceptable system. Furthermore, the longer it takes to put CCASS in operation, the more it will cost the market participants and eventually the investors. The originally budget for the development of CCASS was HK$300 million. As the launch of CCASS has been delayed from Dec 1991 to June 1992, additional $20 million is required for funding HKSCC. Therefore, obviously, the immediate task of both the HKSCC and the SFC is to put CCASS in operation as soon as possible.

The legislative process in Hong Kong is time consuming and independent of the administrative control of the government. Therefore, the only thing that the HKSCC can do is to communicate
more effectively with both the Legislative Council and the SFC so as to acquire the legal protection for the clearing system.

However, the tasks of SEHK, HKSCC and SFC do not end with the launch of CCASS. It may not be realistic to assume that such a new system is already perfect when it is operational. The success of the system seems to rest on the ability of the HKSCC to resolve the problems which arise during the operation of CCASS. For technical problems appearing in the back offices of participants, the technology services division of HKSCC can provide immediate help. It is expected that the board of directors of HKSCC will handle the controversial issues arising from the operation of CCASS. Therefore, the ability of the board of directors of HKSCC to handle conflicts fairly and promptly are critical.

SFC's attempt to change the composition of board of directors of HKSCC protected the interest of the investors, even though SFC's proposal caused delay in launch of CCASS. In the original board of directors of HKSCC, either the representatives from brokers or custodian banks would be the chairman and the majority of the directors were brokers and custodian banks. The revised composition of the board of directors consists of 22 members, of which 11 will come from the Exchange. Five independent members will be appointed by the Financial Secretary and another five will represent those banks which have provided establishment loans to the HKSCC. The chief executive of HKSCC will also be a member. Although more independent directors are appointed and the majority needed for the approval of proposals has been dropped from 75 percent to 51 percent, it is still uncertain whether the board can come to quick and fair
responses to the issues arising in the operation of CCASS. In the short run, it is suggested that SFC should closely monitor the issues concerning CCASS and, if necessary, exercise power to solve the issues promptly. Furthermore, SFC should ensure the system to be adopted by a significant amount of market participants by effectively communicating the features and benefits of the system to them, and if necessary, by some mandatory measures. Obviously, if CCASS can not be successful because some market participants have too much concern about their own interest, the Hong Kong securities market as a whole (including both investors and market participants) will be hurt. However, in the long run, all the issues concerning CCASS should be resolved by the market participants themselves to avoid the problem of over-regulation.

If a significant amount of market participants adopt CCASS, it will be an inevitable trend for the rest of market participants to accept the system sooner or later. For example, a broker to broker trades involves two parties, if one of the parties already adopt paperless settlement, it is impossible for the another party not to adopt the paperless settlement and maintain the old practice. It is expected that the more efficient settlement system, i.e. CCASS, will certainly replace the old system.

After gaining the supports from market participants, both HKSCC and SFC have to allocate more resources to promote the system to the public and to let the investors (especially small investors) to understand the system. The support from the investors is certainly the key to success of CCASS. Finally, more legal protection may be required for small investors to ensure
their confidence of using the CCASS and the process towards dematerialization of scrips can be speeded up.
<table>
<thead>
<tr>
<th>Settlement</th>
<th>ISSA (May 1988)</th>
<th>Kessler (July 1988)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>as short as possible, not more than T+5 for settlement</td>
<td>* no particular timetable proposed * should be standardized across Europe * Generally supports G30</td>
</tr>
</tbody>
</table>

| System features     | * rolling, continuously netted clearing * dematerialisation where possible in a Central Securities Depository and clearing organization controlled by users (one per country) * minimization of risk e.g. by DVP (delivery versus payment) and careful participant criteria | * rolling settlement * one Central Securities Depository in each country * immobilization and book-entry transfer * registered securities via central nominee to ensure good delivery * CSD should be independent supervised, financially sound, non-profit making with participant criteria |

| Payment features    | DVP: simultaneous final payment | * strong emphasis on simultaneous DVP * links with payment system but CSD processes payments through members (CSD) cash accounts |

| International features | * each country's central organization to link, with reciprocity and harmonization of facilities * international dealings should be settled in home country * adoption of international communication standards | * concentration on harmonization with EC * standard bilateral to cooperative agreements between CSDs * immobilization in a lead (usually home) country * CSDs hold cash accounts with each other to achieve DVP across borders * adoption of international communications standards |

Table 1 Summary of clearing and settlement standards proposed by various parties
<table>
<thead>
<tr>
<th>Settlement Timetable</th>
<th>G 30 (March 1989)</th>
<th>FIBV (June 1989)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* T+1 trade confirmation (inc. resolution) for market-side by 1990</td>
<td>supports ISSA, Kessler, G30</td>
</tr>
<tr>
<td></td>
<td>*T+3 settlement, or T+5 interim by 1992</td>
<td></td>
</tr>
</tbody>
</table>

| System features | * rolling settlement by 1992  | * each country has a Central Securities Depository |
|                 | * trade comparison for investors by 1992  | * immobilization or dematerialization and book-entry transfer |
|                 | * Central Securities Depository with broadest coverage of securities by by 1992  | |
|                 | * immobilization or dematerialization and book-entry transfer by 1992 | |
|                 | * consider trade netting  | |
|                 | * registered securities via central nominee  | |
|                 | * lending encouraged to ensure prompt settlement | |

| Payment features | * simultaneous DVP preferably same-day by payments by 1992  | *DVP linked to book-entry transfer in CSD for domestic trades |
|                 | * payments system may be separate from CSD  | * describes three models for cross border settlement with and without DVP |
|                 | * consistent payments arrangements between markets | |

| International features | * concentrates on improving domestic systems as pre-requisite for cross-border developments  | * links between each country's CSD |
|                        | * adoption of international communications standards | * immobilization (or dematerialisation) of securities in home country |

Table 1 (cont.) Summary of clearance and settlement standards proposed by various party

Quoted from: Systemic Risks in Securities Markets
<table>
<thead>
<tr>
<th></th>
<th>Japan</th>
<th>Singapore</th>
<th>Taiwan</th>
<th>Korea</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automated Price</strong></td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Dissemination</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Automated</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Matching</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>only for trade in</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>largest stocks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clearing Body</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Japanese Securities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clearing Corporation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Securities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clearing &amp; Computer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Services (PTE LTD (SCCS)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>The Taiwan Securities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Depository Co Ltd (TSCD)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Clearing</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Central Depository</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>JSCC &amp; JASDEC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Depository</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(PTE LTD (CDP)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TSCD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Physical Depository</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Share Depository Center, SET</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Method of</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clearing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>net book entry</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>system</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Daily netting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clearing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>net computerized</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>clearing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>on the basis of net</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>balance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Method of</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Registration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Registered in the name of beneficial owner or his nominee</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Beneficial owner</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>or his nominee</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Share deposited with CDP are registered in the name of CDP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Registered in the name of the beneficial owner or his nominee</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>general nominee</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Registration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Registered in the name of beneficial owner or his nominee</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Beneficial owner</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>or his nominee</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Settlement period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T+3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T+5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T+1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T+2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T+3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transfer of fund</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net cash payment through TSE's banks account</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net cash settlement through SCSS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net payment through TSCD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net payment through KSSC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net payment through SET</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Guarantee fund</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>contributed by member firms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clearing and settlement fund contributed by TSE's members</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>contributed by KSE members</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>not available</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Comparison of clearing and settlement systems in Asian Countries

iii) some of the information concerning settlement systems in Hong Kong, Thailand, Japan, Indonesia and Malaysia has been updated with information available from the newspaper and various issues of The Securities Journal.
<table>
<thead>
<tr>
<th>Automation of Price Dissemination</th>
<th>Hong Kong</th>
<th>Malaysia</th>
<th>Indonesia</th>
<th>Philippines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automated Matching</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>plan to implement by the end of 1992</td>
<td>Yes, manual intervention in matching process</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Clearing Body</td>
<td>Hong Kong Securities Clearing Company</td>
<td>Securities Clearing Automated Network Services (SCANS)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Central Clearing</td>
<td>No, but plan to implement in June of 1992</td>
<td>No, but plan to implement in July of 1992</td>
<td>No, but plan to implement in one year</td>
<td>No</td>
</tr>
<tr>
<td>Central Depository</td>
<td>No, plan to implement in May of 1992</td>
<td>No, plan to implement in July of 1992</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Method of Clearing</td>
<td>presently physical delivery trade for trade, but will change to central clearing in two phase, phase 1: trade for trade book-entry system; phase 2: continuous net book-entry system</td>
<td>Physical delivery on daily net basis, but will change to net book-entry system</td>
<td>Physical delivery on daily net basis</td>
<td>broker to broker physical clearing</td>
</tr>
<tr>
<td>Central Registration</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Method of Registration</td>
<td>Registered in the name of beneficial owner or his nominee. Shares deposited with CCASS are registered in the name of CCASS</td>
<td>Registered in the name of beneficial owner or his nominee.</td>
<td>Registered in the name of beneficial owner or his nominee</td>
<td>Registered in the name of beneficial owner or his nominee</td>
</tr>
<tr>
<td>Settlement Period</td>
<td>T+1, but will change to T+2 after launch of CCASS</td>
<td>T+6</td>
<td>T+4</td>
<td>T+4</td>
</tr>
<tr>
<td>Transfer of Fund</td>
<td>broker to broker delivery, but will change to electronic payment through</td>
<td>Cash payment through SCANS</td>
<td>broker to broker delivery</td>
<td>broker to broker delivery</td>
</tr>
<tr>
<td>Guarantee Fund</td>
<td>contributed by participants</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 2 (cont.) Comparison of clearing and settlement system in Asian countries
<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>Hong Kong and Shanghai Bank proposed a computerized settlement-cum-depository system to the Committee of the unified Exchange</td>
</tr>
<tr>
<td>1986</td>
<td>Establishment of unified Stock Exchange of Hong Kong</td>
</tr>
<tr>
<td>1987</td>
<td>The stock market was blooming. Serious backlog problems appeared</td>
</tr>
<tr>
<td>1987 Oct</td>
<td>The Exchange was closed for four days due to the paper backlog in securities settlements.</td>
</tr>
<tr>
<td>1988 Jan</td>
<td>Ad hoc steering committee for the central clearing and depository project was formed by HKSE</td>
</tr>
<tr>
<td>1988 May</td>
<td>Davison's report was published which point out the clearing and settlement was the key issue in Hong Kong Stock Market</td>
</tr>
<tr>
<td>1988 Jun</td>
<td>Establishment of Securities and Futures Commission (SFC) Reorganization of HKSE. Compliance division was established and more people are recruited for the operation division.</td>
</tr>
<tr>
<td>1989 Mar</td>
<td>It was announced that the Clearing Company would be incorporated and limited by guarantee</td>
</tr>
<tr>
<td>1989 Jun</td>
<td>The board of directors of Hong Kong Securities Company (HKSCC) had been formed</td>
</tr>
<tr>
<td>1989 Oct</td>
<td>HKSCC issued Circular to member detailing the features and funding arrangements for the central clearing and settlement system and invited comments from members of HKSE The Exchange Council resolved to adopt the proposal on central clearing including the adoption of T+2 as the settlement period for the proposed system.</td>
</tr>
<tr>
<td>1990 Jan</td>
<td>Mr. Paul Chow succeeded Mr. Felix Chow as the Chief Executive of HKSCC.</td>
</tr>
</tbody>
</table>
1990 Apr  The Exchange Council resolved that Council members representing on the Board of HKSCC should be broker members and that the Chairman and the Deputy Chairman of the Board of HKSCC must be a broker or banker member of the Board.

1990 Jul  HKSCC published consultative paper on the share registration system under CCASS

1990 Aug  Federation of Share Registrars criticized the new proposed registration system that it could fundamentally change the relationship between the company and its shareholders and impose tasks and responsibilities on brokers which they are not equipped to handle efficiently and which will reduce efficiency and increase costs.
Top brokers backed the proposed registration system

1990 Oct  HKSCC decided that book-entry settlement between participants within the CCASS would be achieved by immobilizing shares in Central Securities Depository

1991 Jan  HKSCC issued consultative paper on risk management and guarantee system under CCASS

1991 Mar  HKSCC issued consultative paper on business operations and system design of CCASS

1991 Jun  HKSCC published report on system design of CCASS and targeted to implement CCASS on Dec 18 of 1992

1991 Aug  HKSCC announced the fee structure for CCASS

1991 Dec  SFC disagreed with the arrangements for risk management under CCASS, composition of the board of directors of HKSCC
The launch of CCASS was delayed due to lack of legal protection for HKSCC's status as a clearing house.
1992 Feb  SFC and HKSE came to agreement on revised arrangements for risk management and the composition of board of directors of HKSCC. The launch date was targeted to be April of 1992.

1992 Mar  The Lawyer Society of Hong Kong and Accountant Society of Hong Kong criticized that the procedures for handling bankrupt brokers' transactions in CCASS violated company law.

1992 Apr  The launch date of CCASS was scheduled to be early June of 1992.

Source: various issues of The Securities Journal and the newspapers
OVERVIEW OF CCASS OPERATIONS

Source: Report on the System Design of CCASS

Legend:
- ATI — Account Transfer Instruction
- HKAB — The Hong Kong Association of Banks
- CNS — Continuous Net Settlement
- DI — Delivery Instruction
- PCS — Provisional Clearing Statement
- SEHK — The Stock Exchange of Hong Kong
- FCS — Final Clearing Statement

Note:
1. Cleared through The Hong Kong Association of Banks’ clearing system
2. If settlement efficiency on T+2 is not satisfactory, HKSCC may consider implementing appropriate measures such as compulsory stock borrowing and fines.
OVERVIEW OF RISK MANAGEMENT MEASURES

SEHK

Brokers' trades in eligible securities to be settled in CCASS

CCASS

Trades to be settled on a CNS basis with HKSCC as counterparty (CNS System)

CNS trades to be guaranteed by HKSCC

Trades to be settled on a trade-for-trade basis between the original counterparty brokers (Isolated Trades System)

<table>
<thead>
<tr>
<th>STATUS</th>
<th>RISK</th>
<th>RISK MANAGEMENT MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pending CNS positions</td>
<td>Market</td>
<td>• Collect net unfavourable marks if:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(i) aggregate value of CNS trades &gt; settlement cap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii) excessive risks are created i.e. net unfavourable marks &gt; collateral</td>
</tr>
<tr>
<td>Outstanding CNS positions</td>
<td>Market</td>
<td>• Collect net unfavourable marks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Generate buy-in orders by the end of T+3 for execution on T+4 morning</td>
</tr>
<tr>
<td>Money settlement positions</td>
<td>Credit</td>
<td>• Bank guarantee and/or holding of shares allocated to broker under CNS as collateral</td>
</tr>
</tbody>
</table>

Source: Report on the System Design of CCASS
Annex — Item 3
CCASS PROCESSING SCHEDULE

<table>
<thead>
<tr>
<th>Daily CCASS Services</th>
<th>Processing Schedule for Settlement of SEHK Trades</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monday—Friday.</strong></td>
<td><strong>T</strong></td>
</tr>
<tr>
<td>8:00 am</td>
<td>CCASS services commence</td>
</tr>
<tr>
<td>9:00 am</td>
<td></td>
</tr>
<tr>
<td>10:00 am</td>
<td></td>
</tr>
<tr>
<td>11:00 am</td>
<td></td>
</tr>
<tr>
<td>12:00 noon</td>
<td></td>
</tr>
<tr>
<td>1:00 pm</td>
<td></td>
</tr>
<tr>
<td>2:00 pm</td>
<td></td>
</tr>
<tr>
<td>3:00 pm</td>
<td></td>
</tr>
<tr>
<td>4:00 pm</td>
<td></td>
</tr>
<tr>
<td>5:00 pm</td>
<td></td>
</tr>
<tr>
<td>6:00 pm</td>
<td></td>
</tr>
<tr>
<td>7:00 pm</td>
<td>CCASS services close</td>
</tr>
</tbody>
</table>

**Legend:**
- CCASS processing
- CCASS output
- Batch settlement run
- Money settlement (outside CCASS)
- Preliminary confirmation of doubtful payment before 9:30 am
- Final confirmation of doubtful payment before 11:00 am

**Note:**
1. Services available to all CCASS participants.
2. Settlement processing schedule applicable to broker participants only.
3. Settlement Report gives details of all CNS trades, isolated trades, and SI transactions due and/or overdue on the settlement day.
4. HKSCC's guarantee of settlement on CNS trades starts.
5. Position Report gives details of both stock and money positions on CNS trades, isolated trades, and SI transactions due and/or overdue on the settlement day.

**Source:** Report on the System Design of CCASS
<table>
<thead>
<tr>
<th>Fee Nature</th>
<th>Broker-broker trade</th>
<th>Clearing fee</th>
<th>SI transaction</th>
<th>SI Input</th>
<th>Fee Amount</th>
<th>Due and Debit Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nil</td>
<td>SI transaction</td>
<td>SI amendment or revocation</td>
<td>HK$2.5 per Instruction</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HK$10 per Instruction</td>
<td>Input date</td>
</tr>
<tr>
<td>Stock settlement fee</td>
<td>Broker-broker trade</td>
<td>Stock settlement fee</td>
<td>SI transaction</td>
<td>Broker-custodian transaction (with trade value data input)</td>
<td>0.014% of gross trade values, subject to a minimum fee of HK$3 and maximum fee of HK$400 per transaction</td>
<td>T + 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Broker-custodian transaction (in the absence of trade value data input)</td>
<td>0.014% of stock market values on settlement date, subject to a minimum fee of HK$3 and maximum fee of HK$400 per transaction</td>
<td>On completion of settlement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Other SI transactions e.g. stock borrowing/lending, stock pledging and portfolio movement</td>
<td>Subject to further negotiations with HKSCC's banker, the fees will probably be in line with standards set by the Hong Kong Association of Banks</td>
<td>Value date</td>
</tr>
<tr>
<td>Stock transfer between a participant's own stock accounts (effected by ATI)</td>
<td>Broker-broker trade</td>
<td>N/A</td>
<td></td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Money settlement fee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
<td>Subject to further negotiations with HKSCC's banker, the fees will probably be in line with standards set by the Hong Kong Association of Banks</td>
</tr>
</tbody>
</table>

**Source:** Report on the System Design of CCASS

**Bureau Facilities Provided by HKSCC**

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
<th>Fee</th>
<th>Due and Debit Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction input service fee</td>
<td>HK$3 per instruction for the first 3 months of the launch of CCASS and HK$15 per instruction thereafter</td>
<td>Due and debited on service date</td>
<td></td>
</tr>
<tr>
<td>Report printing service fee</td>
<td>HK$2.5 per page for daily or periodic reports printed by HKSCC, HK$10 per page for lost copies or reports at participants' requests (printed by HKSCC)</td>
<td>Due and debited on service date</td>
<td></td>
</tr>
</tbody>
</table>
I am indebted to those people who have interviewed with me and shared their insights about the CCASS. However, as some of them consider that they only represent their personal views about CCASS but not the views of the financial institutions that they are working with, they are not willing to reveal their names in this paper.

For the successful completion of this paper, four interviews were conducted:

2 April 1992  Interview one: Tam, Albert, Fair Eagle Ltd, Hong Kong.

6 April 1992  Interview two: an operations manager of an international brokerage house

8 April 1992  Interview three: an assistant manager of a custodian bank

9 April 1992  Interview four: Chan, Jessica, Officer – Corporate Communications, Hong Kong Securities Clearing Company, Hong Kong
REFERENCES


Sargent, Sarah, "Settlement breaks new ground", Asiamoney, October 1991, p.34.


Foster, Angus, "Speed up or be banned", Asiamoney, March 1991, p.29-33.


