Treasury-Federal Reserve Study of
the U. S. Government Securities Market

AUTOMATING GOVERNMENT SECURITIES MARKET OPERATIONS

Staff study prepared by
F. T. Davis and M. J. Hoey
Federal Reserve Bank of New York
December 1966 (Rev. June 1969)

CONTENTS

I - Introduction

The market in securities of the United States Government as we know it today, so important both to fiscal policy and to the well-being of our economy, had its beginnings in the expansion of trading that characterized the Liberty Loan Bonds issued during the First World War. With the exception of the Federal Reserve System's telegraphic securities transfer facilities, introduced in 1921, the five intervening decades since World War I have seen few changes in the cumbersome and time-consuming practices observed in issuing, receiving, and delivering Government securities. Considering that the purchases and sales made by the primary dealers in U. S. Governments frequently number in the thousands on a single day, it is apparent that an enormous amount of time and effort is expended, unnecessarily, in completing all these individual transactions by physical delivery of the securities concerned.

In mid-1965 a beginning was made toward reducing the need for individual "Street" deliveries of Government securities by the creation of an experimental clearing arrangement applicable to securities transfers between two New York City member banks and banks in other Federal Reserve Districts through the Federal Reserve System's telegraphic transfer facilities. This paper describes that new clearing arrangement, which has since been expanded to include eight of the eleven New York City member banks whose operations in the Government bond market, either directly or as clearing agent for nonbank dealers, are sufficiently broad to warrant their participation in such an arrangement. Of even greater importance, the clearing concept now encompasses local transfers of Government securities among the New York City participants, in addition to the inter-District transfers for which it was originally designed. A brief illustrated description of the various types of Government securities transfers eligible for inclusion in the clearing arrangement appears in the accompanying charts.

During the same years that the securities clearing arrangement was being developed in New York, plans were also being formulated within the Federal Reserve System for the establishment of a book-entry procedure in connection with the issuance and custody of U. S. Government securities held by the Reserve Banks for member banks and certain other parties that maintain securities accounts with the Reserve Banks. Among other things, the book-entry procedure will ultimately contribute to the further development of the securities clearing arrangement by eliminating the present need to settle the daily net clearing balances by the delivery of definitive securities. This prospect, and other important implications of the book-entry concept, are also discussed in this paper.

II - Securities Clearing Arrangement

CLEARING TELEGRAPHIC TRANSFERS OF GOVERNMENT SECURITIES From time to time over recent years the Federal Reserve Bank of New York has considered various proposals designed to reduce the substantial volume of Government securities that are daily delivered to and from this Bank, as fiscal agent of the United States, in connection with inter-District telegraphic transfers of such securities between Federal Reserve cities. Early in 1965 the Bank formulated a proposal designed to achieve this objective.

In essence, the proposal contemplated a clearing arrangement between this Bank and seven of the major New York City member banks,[1] providing for the establishment of securities clearing accounts at this Bank in the name of each participating bank; in lieu of the physical deliveries of securities by or to the New York City member banks then being made in connection with each individual telegraphic transfer, appropriate entries would be made in the clearing accounts, predicated on closed-circuit teletype notification to or from the bank concerned. Settlement of the securities owing at the close of business each day, based on the net balances developed in the securities clearing accounts of each participant, would be made by deliveries of securities at this Bank, in the amounts indicated by such balances, at or after the close of business. It was estimated

---

1 Bankers Trust Company, Chase Manhattan Bank, Chemical Bank New York Trust Company, First National City Bank, Irving Trust Company, Manufacturers Hanover Trust Company, and Morgan Guaranty Trust Company.

that, overall, this clearing process should result in reducing by about 80 per cent the burden of physical securities handling associated with these transactions.

Following discussion of this proposal with the Treasury Department, this Bank received early in 1965 Treasury approval to conduct a pilot test operation of such a clearing arrangement with Morgan Guaranty Trust Company. The pilot test was commenced in July of that year and was extended in August to include Irving Trust Company. On the basis of the successful test experience Bankers Trust Company and Manufacturers Hanover Trust Company were invited to join the arrangement in mid-1966, followed successively by First National City Bank, Chemical Bank New York Trust Company, Chase Manhattan Bank, and the Bank of New York. With these additions the clearing arrangement grew to include as active participants eight of the eleven[2] New York City banks whose operations in the Government bond market, either directly or as clearing agent for nonbank dealers, are on a scale broad enough to make participation in a local clearing arrangement attractive and efficient. It is, of course, entirely possible that other banks may elect to take advantage of the clearing concept as the scope of its activities grows wider.

During the initial stages of the clearing arrangement questions necessarily arose as to the limitations that should be established regarding participation therein. For example, while it was originally contemplated that the arrangement would extend only to the seven largest member banks in New York City, and through them to the principal dealers in

---

2 Franklin National Bank will become the ninth active participant in June 1969. Marine Midland Grace Trust Company and United States Trust Company joined in signing the clearing agreement but have no immediate plans for active participation.

Government securities, a number of exploratory inquiries were received regarding direct nonbank dealer participation. It appeared that it would not be necessary or appropriate for this Bank to enter into such direct arrangements with nonbank dealers so long as their clearing needs are adequately served by the member banks in the clearing group. Similarly, this Bank believes that dealer banks located in other Districts can and should participate in the clearing arrangement through the facilities offered by participating member banks in this city.

DEVELOPMENT OF A FULL-SCALE GOVERNMENT SECURITIES CLEARING ARRANGEMENT

This Bank's experience in conducting the clearing arrangement in its initial stages soon established that (1) there was a considerable and increasing volume of transactions between the principal local banks involving the physical delivery and receipt of Government securities, other than those related to inter-District transfers, and, (2) there was also considerable interest on the part of the New York City banks and the larger nonbank dealers in Government securities in the development of an effective mechanism for clearing these intra-city member bank transactions in such securities. On the basis of this knowledge, the Bank initiated in January 1966 a series of discussions with members of The New York Clearing House Association aimed at the development of a workable arrangement for clearing all transactions in Government securities that in any way involved the larger New York City banks. In support of its view that the present "clearance and payment facilities underlying the market for U.S. Government securities are less than adequate", the Clearing House prepared a paper stating in some detail the deficiences existing in the available market mechanism and the steps it believed ought to be taken to remedy that condition.

The paper included the observation that the development of a central clearing arrangement could substantially relieve the strain on present facilities, would be in the public interest, and would facilitate the implementation of monetary and debt management policies in a growing economy. Comments in the "Highlights of Replies to Dealer Questionnaire" and "Highlights of Dealer Consultations", based on material developed for the Treasury/Federal Reserve Study of the U.S. Government Securities Market, also make reference to the need for a central clearing arrangement, accompanied by automated procedures for centrally recording the ownership of Government securities.

In the course of discussions with the Clearing House banks, it became quite evident that a clearing arrangement to include intra-city transactions in Government securities could be developed only through the temporary daily use, in connection with the daily clearing settlements, of the stock of unissued Government securities held at this Bank as fiscal agent of the United States. Proceeding on this premise, counsel to this Bank drafted an agreement embracing both inter-District and intra-city transfers which, following approval by the ten New York Clearing House banks, became effective in August 1967, superseding previous letter agreements. The clearing of intra-city transfers had earlier been approved in principle by the Treasury Department, with the understanding that any additional costs incurred by this Bank due to processing the local transactions would be shared by the participating banks and would not be borne by the Treasury Department.

While all inbound inter-District transfers, whether "free"[3]

---

3 A "free" transfer occurs when the payment associated with the sale of the securities has been effected separately from the transfer itself; payment is not required as a condition to the delivery of the securities.

or against payment, were eligible for clearing through the arrangement, outbound transfers were limited at the outset to those made against payment. Subsequently, provision was made for the inclusion of outbound as well as inbound "free" transfers, either inter-District or intra-city, predicated on an agreement under which the participating banks undertook to indemnify this Bank against loss in the event of non-delivery of balances owing to this Bank.

The processing of intra-city transfers through the clearing arrangement has proved valuable to the participating New York City member banks and to the nonbank dealers they serve, even though it has been necessary to limit the total volume of these transactions until such time as suitable electronic data processing equipment can be put into operation by this Bank. Such equipment, which is scheduled for installation by year-end 1969, will have the capability of switching transfer instructions automatically, and at the same time capturing all pertinent information for clearing and accounting purposes, including the development of net securities balances of the various participants, and the entry of debits and credits, representing payments for the securities transferred, to the reserve accounts of the member banks concerned. Pending the installation of this electronic equipment, messages must be relayed and settlement positions developed by manual methods. Accordingly, it has been necessary to keep the volume of intra-city transactions within manageable limits by establishing relatively high dollar amounts per transaction (currently $250,000) as the minimum amount eligible for handling through the clearing arrangement.

OTHER TRANSACTIONS PROCESSABLE THROUGH CLEARINGS There is a substantial amount of daily traffic between this Bank and the New York City banks and dealers in connection with the "splitting", or denominational exchange, of Government securities, the rapid completion of which can often be a critical factor in completing physical deliveries on a timely basis. In order to expedite these denominational exchanges the clearing arrangement was broadened, effective in January 1969, to allow the participants to request the "change" they require over the clearing teletype facilities, deferring the surrender of the larger denominated certificates for inclusion as a part of the day's net settlement of balances.

As another means of encouraging the maximum use of the clearing arrangement, banks and other institutions subscribing to new issues of Government securities, such as the weekly Treasury Bill offerings, are permitted to take "delivery" of those securities, in whole or in part, as a credit to their clearing account for the issue in question. Inasmuch as a considerable portion of such newly issued securities are destined for wire transfer to other local clearing banks, or to other Federal Reserve Banks and Branches, on the issue date, this use of the clearing arrangement can eliminate a great deal of unnecessary physical handling for all parties concerned.

Looking forward to the time when most of the transactions in Government securities involving the principal dealers therein are being accommodated by the clearing arrangement, it would seem possible to broaden the scope of the clearings to include securities issued by Agencies of the United States. This possibility is further discussed in Section V.

The principle of clearing and settling for valuables on a net balance basis is not a novel one, nor is the use of telegraphically communicated information to effect the transfer of securities between a seller and a purchaser. However, the combination of these two established concepts in the current clearing arrangement, supported by the high-speed switching and data-processing capabilities offered by today's electronic computers, can provide much-needed assistance in coping with the rapidly growing physical burden already taxing the resources of large-volume handlers of Government securities.

III - Book-Entry Procedure

In June of 1963 the Board of Governors of the Federal Reserve System suggested that the Conference of Presidents of the Federal Reserve Banks consider the merits of adopting a book-entry arrangement for Government securities held in custody for member banks, as a means of freeing vault space, reducing the burden of cutting and collecting coupon interest, and minimizing the risk of misplacing securities of high value. Following a study of this proposal by the various Reserve Banks, discussions were held with officials of the Treasury Department and performance tests were conducted at selected Reserve Banks. Meanwhile, counsel to the Reserve Banks, in association with counsel to the Treasury Department, continued to review the legal implications of the proposed book-entry procedure, which was thereafter approved in principle by the Conference of Presidents in December 1965.

As approved by the Conference of Presidents, the book-entry procedure permits the Reserve Banks to discontinue issuing definitive securities and placing such securities in the custody accounts affected, relying instead on a computer-based system of book-entry securities. Originally, the book-entry procedure applied only to Government securities held for member banks (1) as free safekeeping deposits, (2) as collateral to Reserve Bank advances, and (3) as collateral to Treasury Tax and Loan Accounts and other public deposits. Pursuant to specific regulations governing book-entry accounts formulated by the Treasury Department, the program was put into effect at the various Federal Reserve offices commencing January 1, 1968, and all holdings of Government securities for the types of accounts mentioned above at such offices were converted to a book-entry basis by the end of that year. In addition, a number of custody accounts maintained by the Federal Reserve Bank of New York for the Treasury Department and for various international organizations were also converted.

While not expressed in the approval of the Conference of Presidents, adoption of the book-entry procedure for safekeeping accounts effectively brought to an end the long-standing policy of the Reserve Banks against the acceptance of safekeeping deposits from banks located in the central financial districts of their respective cities, which policy was based primarily on the limited vault facilities available at the Reserve Banks. However, because the book-entry procedure as initially promulgated was in effect confined to the investment holdings of member banks, and since a considerable amount of movement occurs between such securities and those held by "city" banks as custodians for their correspondent banks, trust accounts, and others, including pledged accounts, there was little response from such banks to the offer of this new service. In addition, such banks have been reluctant to put any of these securities under the book-entry system because of the requirements of existing Internal Revenue Service rulings regarding the identification of such book-entry securities for tax purposes.

A major step toward overcoming some of the obstacles now impeding the full-scale use of the book-entry procedure is currently in progress, under which the applicable Treasury Department regulations are being revised and broadened to permit the conversion of certain "third-party" accounts to a book-entry basis. This revision, though applicable at the outset to pledged accounts of the types currently in effect at the

Federal Reserve Banks and Branches, nevertheless opens the door to the inclusion of additional categories of accounts maintained by member banks subject to the orders of others, such as correspondent banks, trust accounts, and nonbank dealers in Government securities. Coincidentally, attempts are being made to bring about a modification of the current Internal Revenue Service regulation on book-entry securities which, if successful, should simplify the carrying out of transactions in these accounts.

Although large-scale adoption of the book-entry procedure by banks in the central financial districts would present no difficulties in terms of the maintenance by this Bank of the required book-entry records, it could well generate a substantial amount of daily traffic caused by requests from these depositors for physical delivery of securities to their representatives, or to others for their account. As discussed under the next topic, however, the effects of this increased activity, at least in the Federal Reserve Bank of New York, will be appreciably reduced to the extent that the securities can be transferred through the existing securities clearing arrangement, necessitating only teletype notification, rather than physical delivery, to effect a transfer between participating banks.

Plans are now being made to convert the securities in the System Open Market Account to a book-entry procedure. At some future date, discussions will be held with foreign central banks with a view to converting their holdings to a book-entry system also. The inclusion of the Open Market Account and this Bank's foreign accounts would greatly facilitate the movement of securities resulting from the purchase and sale transactions that occur so frequently between these accounts and member banks.

Still further in the future may be the extension of book-entry arrangements at one or more Reserve Banks to accommodate virtually all owners of Government securities, including nonbanking institutions and individuals, through member banks. Once the principle of relatively unlimited computer storage capacity is accepted, there appear to be no insurmountable barriers to the furnishing of book-entry custody service to all types of holders, with appropriate identification on the books of the Reserve Banks.

IV - Effecting Clearing Settlements Through Book-Entry

As discussed in the preceding section, the book-entry procedure adopted by the Federal Reserve Banks in January 1968, was restricted to Government securities owned by member banks and deposited with their Reserve Banks to be held either in free safekeeping, or as collateral to Reserve Bank advances, Treasury Tax and Loan Accounts, or public deposits. Within a short time, however, the book-entry concept will be extended to apply to all Government securities held by member banks for their own or other accounts, thereby encompassing a number of additional categories of holdings, including pledge arrangements, not provided for under the present system.

The development of the Government securities clearing arrangement has been accompanied by a gradual broadening of the types of transactions covered. For example, while inter-District transfers of securities between Federal Reserve Banks and Branches are restricted to bona fide sale transactions, or the borrowing or return of securities by a primary securities dealer, no such limitation has been applied to the intra-city transfer arrangement. As a consequence the local transfer activity will increasingly be expanded to include transfers involving pledged, or "third-party" accounts, collateral to dealer loans and loans to others, and similar transactions. Thus the net settlements of the clearing balances at the end of each day will involve a broad cross-section of the kinds of accounts maintained by any one participating bank.

Under the book-entry procedure as it exists at this moment, these diverse types of accounts are not included among those that are eligible, and it is therefore not possible to settle the clearing account balances through entry to such book-entry accounts. However, once the enabling steps have been taken to permit relatively unrestricted Government security custody services to member banks on a book-entry basis, the way will be cleared to permit a fully automated Government securities clearing arrangement, free of the present need to transport large dollar amounts of securities to and from this Bank in settlement of net balances at the close of business each day. In lieu of such physical settlements it will be necessary for this Bank merely to credit or debit the respective book-entry accounts of the clearing banks with the par amounts of the Government securities issues owing to or from each bank as a result of the netting process. To permit accurate accounting to their depositors, the member banks would be expected to maintain adequate internal records indicating the exact interests of each of their dealer or custody accounts in the net clearing settlements, and in the resulting book-entry account balances. Normally the clearing settlements would involve only one debit or credit entry for each affected securities issue in a bank's book-entry account, but in certain cases it is contemplated that a limited number of sub-accounts would be maintained for individual banks corresponding to the general categories of account (investment, trust, etc.) on the books of the bank.

One area of expansion of the clearing arrangement that should be greatly assisted by the use of book-entry facilities relates to the movement of securities as collateral to overnight loans made by banks to nonbank dealers in Government securities. Normally negotiated well after mid-day, when the dealers have tallied up their total receipts and deliveries of securities and assessed their cash requirements, these loans call for the physical movement of a large volume of Governments, amounting in the aggregate to hundreds of millions of dollars, from the banks where the securities are lodged to the banks which are extending the loans. The labor involved in the counting, examining, and movement of this collateral causes delays that normally defer the delivery of the pledged securities to the lending banks until a fairly late hour in the afternoon. Under a combined book-entry and clearing procedure it would be posssible to effect these transfers simply by making entries in the accounts affected at this Bank, confirmed by appropriate teletype notification, which should accelerate the "deposit" of loan collateral substantially. The proceeds of the loan would be debited to the reserve account of the lending bank and credited to the borrowing dealer, through the reserve account of its clearing bank, at the same time that the securities are transferred in the book-entry accounts. All entries would then be reversed on the following day when the loan is liquidated. Such an arrangement, in addition to saving a considerable amount of time, would also eliminate the present risks attending the exposure of large dollar amounts of securities in the streets.

V - Clearing and Book-Entry Applied to Agency Securities

There has been a rapid growth during recent years in the volume of securities offered by the various Agencies of the United States Government. The attractive rates afforded by these securities, which are virtually indistinguishable from Governments from the standpoint of safety, have generated considerable interest on the part of all investor classes, resulting in a steadily rising trading pace for such securities in the major financial markets.

Up to the present time, with few exceptions, all securities of Agencies of the United States have been issued and paid for solely through the Federal Reserve Bank of New York. Since most of these issues are not eligible for telegraphic transfer through the leased wire facilities of the Federal Reserve System,[4] purchasers located in other parts of the country are obligated to lodge their holdings with correspondents in New York City or incur substantial costs incident to shipment to their own city.[5]

In a number of instances, however, arrangements have been made whereby subscribers in New York City to certain bearer issues of the Federal National Mortgage Association and the Export-Import Bank of the United States may transfer their allotments, through Federal Reserve System

---

4 Telegraphic transfer between Reserve Banks and Branches is possible only where stocks of unissued securities are maintained at such banks in connection with the original issue and related fiscal services.

5 Shipment by registered mail will be made at the expense of the issuer at the time of original issue only.

telegraphic facilities, to either the Chicago or the San Francisco Federal Reserve Bank, which will complete delivery from a supply of unissued stock maintained for that purpose. In addition, telegraphic transfers resulting from subsequent transactions in these securities may be effected between these three Federal Reserve Banks by means of the same facilities.

The further development and expansion of the securities clearing arrangement discussed in this paper must of necessity extend, in time, to include obligations of Agencies of the United States, if the arrangement is to furnish complete service to the financial community. To the extent that these non-Government securities may become eligible for telegraphic transfer through Federal Reserve facilities, there will be an increasing need to include them among the issues represented in the clearings. In any event, the anticipated continuing expansion of the clearing arrangement may ultimately necessitate the use of this mechanism to simplify the local delivery of Agency securities, whether or not these issues become eligible for telegraphic transfer between Federal Reserve cities. As noted earlier, any costs incurred by the Federal Reserve Bank of New York in providing an intra-city clearing service, whether for Government or non-Government securities, would be absorbed by the participants in such an arrangement rather than by the Treasury Department.

It is likely that the establishment of book-entry custody arrangements at the Reserve Banks, applicable initially to Government securities owned by their member banks, and later to securities owned by the depositors and customers of these banks, will ultimately lead to the inclusion of securities of Government Agencies as well. The resulting expansion of the clearing arrangement and the book-entry procedure by roughly one hundred per cent, in terms of the number of individual issues involved in each category at the present time, should present no administrative problem given the immense record-keeping capability of the sophisticated data processing equipment now available. Since the Reserve Banks have long accepted the deposit for custody of all types of securities, including Agencies, from their member banks, neither does any question of policy arise in this connection.

VI - Conclusion

The fifty years that have elapsed since the start of World War I have seen remarkable changes affecting almost every aspect of the economy. The myriad benefits of a computer-oriented society appear on all sides, and the adoption of sophisticated labor and time saving devices has become prevalent in practically all areas of financial and industrial activity. Nevertheless, the streets of Manhattan and other financial centers through the country are still filled with hundreds of messengers making thousands of trips each day, delivering individual lots of securities back and forth between the banks and dealers that comprise the Government bond market, exactly as they did when the first offering of Liberty Loan bonds was made five decades ago. The failure to complete any one such delivery by the appointed time can cause the cancellation of trades involving millions of dollars, result in unanticipated and unnecessary interest costs, and create operational problems that may affect a number of parties to these transactions.

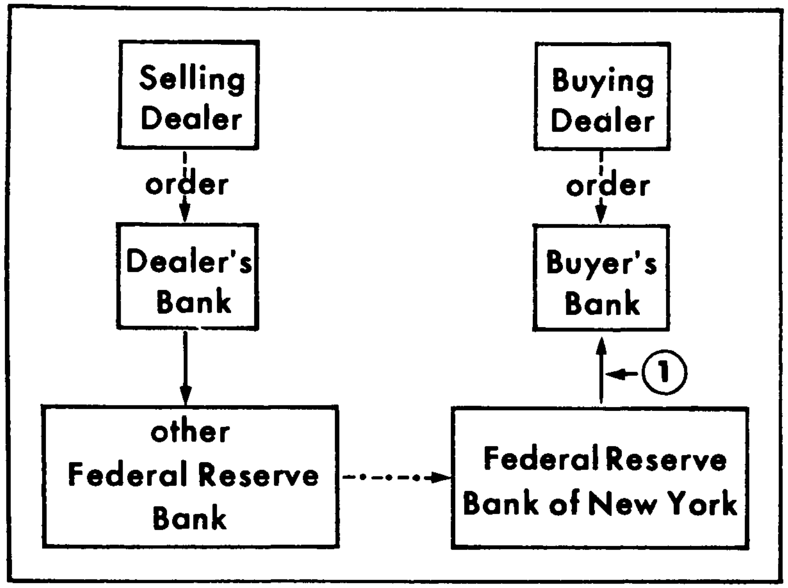
It is apparent that it is now essential to change these cumbersome delivery methods and allow the traders in Government securities to function free of the limitations that antiquated physical delivery methods impose. Now that transactions in securities can be finally consummated in seconds by means of teletype, and painfully slow individual deliveries can be replaced by end-of-day settlement on a book-entry basis, the means are at hand for radically improving the market mechanism. The savings in time and labor resulting from the elimination of most physical securities-handling tasks must of necessity result in more economical operations on the part of all Government bond dealers, their clearing banks, the Treasury Department, and the Federal Reserve Bank of New York as well.

The combination of teletype delivery techniques, clearing procedures, and book-entry arrangements, conducted with the aid of relatively unlimited computer switching and data storage capability, can now broaden the scope of Government trading activities to a degree never before thought possible. Instantaneous completion of transactions, with immediate payment in Federal Funds, will become commonplace and markets throughout the country will be as accessible as those across the street. Further, the need to issue, receive, deliver, or store physical securities will diminish rapidly, in direct proportion to the increase in the number of banks and other parties covered by the new arrangements. In a period when extreme time pressures, heavy work loads, and shortages of skilled manpower have become--and will continue to be--crucial factors in all securities operations, these new techniques offer the promise of solutions to many of the growing problems that are being faced by banks, dealers, and others involved in Government securities operations.

Charts of Typical Clearing Transactions

CPD Transfer

PHYSICAL DELIVERY

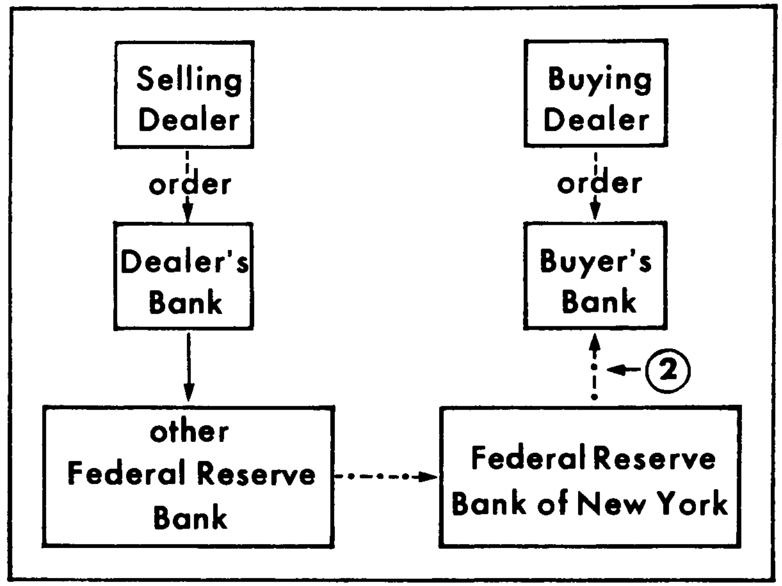


TIME: 1¾ Hrs.

In a typical CPD transfer, a seller in San Francisco, for example, delivers Government securities to the Reserve Bank in that city, which "retires" the securities surrendered and sends teletype instructions to the Reserve Bank in New York City to "issue" a like amount of the same securities to the purchaser. Upon receipt of the telegraphic order, the New York Reserve Bank normally withdraws the securities from its unissued stock and delivers them to the purchaser or its clearing bank over the counter (see 1 on chart). This involves several counting and examining operations by the Reserve Bank as well as by the bank or dealer accepting delivery of the securities, which must be individually transported to their offices. In effecting this physical delivery approximately 1 hour and 45 minutes will elapse from the receipt of the teletype message by the Reserve Bank until receipt and final processing of the securities at the office of the New York bank or dealer.

Teletype —·—·—·
Telephone or Messenger -------
Messenger ————

CLEARING ARRANGEMENT

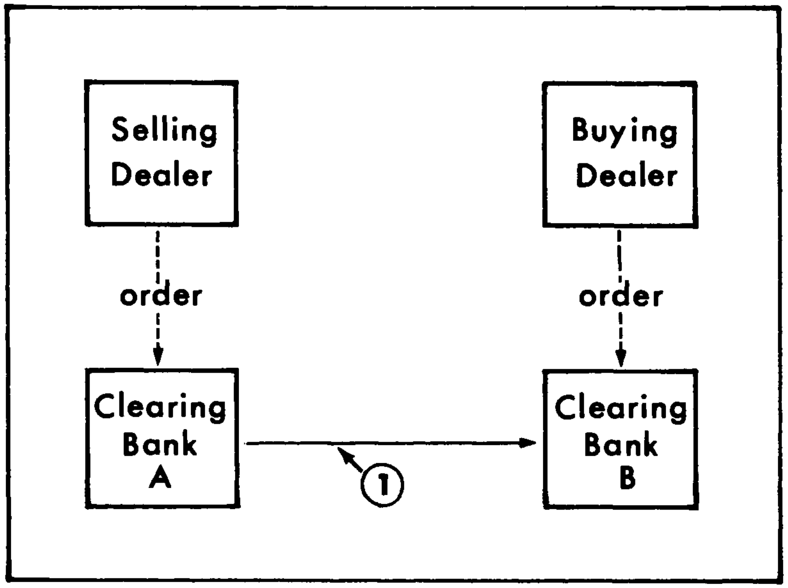


TIME: 2 Min.

By comparison to the present procedure, the same delivery of securities involved in telegraphic transfers can be accomplished by a teletype notification from the New York Reserve Bank to the New York City participant (see 2 on chart). Such notification includes all the particulars of the transfer and permits the recipient to readdress the securities, in whole or in part, to any other participant in the arrangement where necessary. Since physical handling of the securities is eliminated at this stage, no more than 2 minutes elapsed time is required to complete an incoming telegraphic transfer as compared to nearly 2 hours where physical delivery is made. At the end of the day, of course, physical settlement is made by the Reserve Bank with each participant based on the net amounts of securities of each issue in which transfers took place that day.

Local New York City Transfer

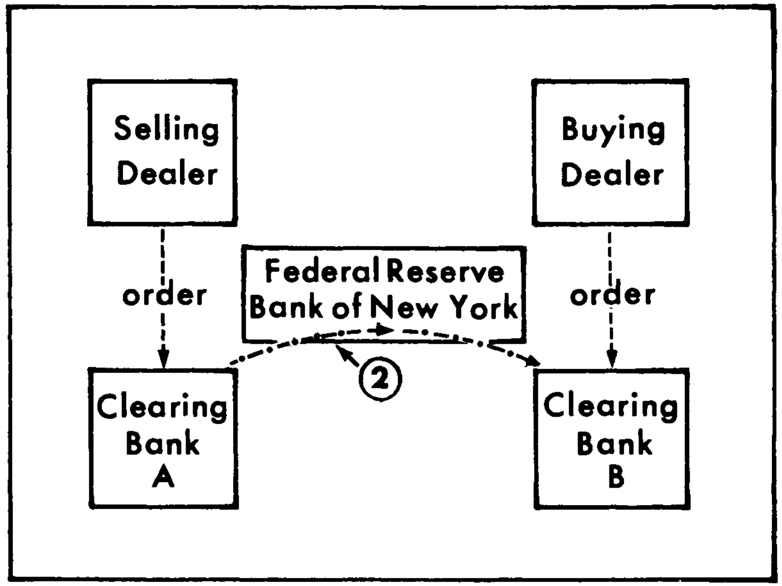
PHYSICAL DELIVERY



TIME: 1¾ Hrs.

In fulfilling a typical sale of Government securities by one dealer to another located in the same city, the seller will order his clearing bank to deliver a stated amount and issue of securities to the other dealer, usually through the clearing bank of the latter, against a stated payment. Completion of such a transaction necessarily involves withdrawal of the securities from a vault or other repository at Bank A, several counting and examining operations at that bank, and finally delivery by messenger to Bank B (see 1 on chart) where the counting and examining process is repeated and the securities are ultimately deposited in custody for the account of the buying dealer. Not until the receiving bank has verified the correctness of the securities it received is payment for the transaction effected, usually by sending a Federal Funds payment through the wire transfer facilities of the Federal Reserve Bank. On average, such a transaction requires at least 1 hour and 45 minutes for completion.

CLEARING ARRANGEMENT



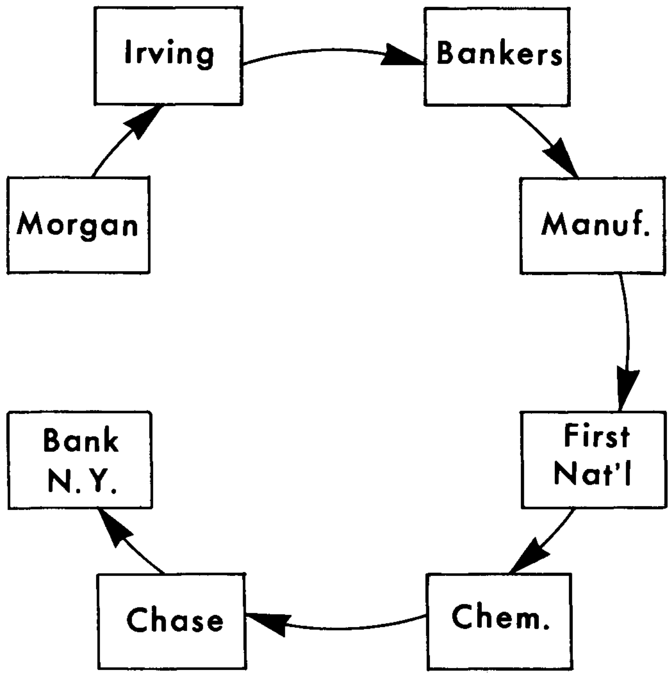
TIME: 2 Min.

By comparison to the present procedure, the same delivery of securities can be accomplished through the Federal Reserve clearing arrangement by means of a simple teletype message from Bank A addressed to Bank B (see 2 on chart). Such message includes pertinent information concerning both the selling dealer and the purchasing dealer, and results in adjustments in the securities clearings accounts of the two participating banks concerned, on the books of the Reserve Bank. No movement of securities is required for individual transactions, settlement being made on a net balance basis at the end of the day, and payment for the transaction is debited and credited to the reserve accounts of the respective banks coincident with the transfer of securities.

Teletype —•—•—•
Telephone or Messenger ------
Messenger ————

Multiple Transfer
Involving All Participants

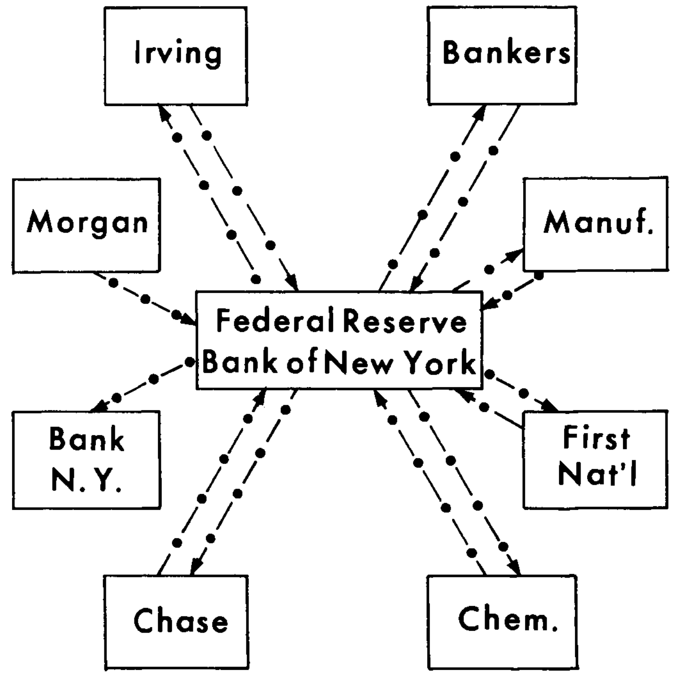
PHYSICAL DELIVERY



TIME: 5Hrs.

In a hypothetical case, if a given lot of securities were sold by one bank (or dealer) to another, then resold by the buyer to a third bank, and so on, it is estimated that the various withdrawal, counting, and delivering operations necessary to move the securities through the series of banks would require at least 5 hours to complete. In addition, there would be serious doubt whether the last one or two banks in the series would be willing to accept delivery considering the established closing hours for the receipt of Government securities.

CLEARING ARRANGMENT



TIME: 50Min.

Under a clearing arrangement, whereby deliveries of Government securities are effected by teletype notification through the Reserve Bank, it is merely necessary for the first bank to send teletype instructions to Federal, which relays them to the bank addressed, which in turn sends a teletype order to the third bank, and so on. The only time required under this arrangement to complete all the hypothetical transactions is that involved in receiving and retransmitting tape messages, which should not exceed an aggregate of 50 minutes. Physical settlement for these transfers would be effected by the net amounts of securities received or delivered at the end of the day and, in the hypothetical case described, the first bank in the series would owe us the securities which we would deliver to the last bank in the series.

Teletype —•—•—•
Messenger ————