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Pricing Fedwire Daylight Overdrafts

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This document is a Federal Reserve staff discussion paper. The issues covered have not been reviewed by the Board of Governors. While the paper presents a discussion of a particular framework for pricing overdrafts, this is only illustrative and other pricing methodologies are possible. The document is being circulated to assist interested parties in formulating their comments on a Board request for public comment on the concept of pricing Fedwire daylight overdrafts.

I. Summary.

Pricing Fedwire daylight overdrafts could provide depository institutions (DIs) with additional incentives to develop and implement changes that may reduce further the level of overdrafts and Reserve Bank credit exposure. In addition, it might help redistribute risks toward those DIs with sufficient capital to more safely assume them. Such a pricing policy could take place within the existing policy framework of cross-system and network-specific caps. Pricing may also be viewed as a complement to the proposal, currently out for public comment, that cross-system sender net debit caps be reduced by 25 percent. Caps seek to limit maximum daylight overdrafts while pricing would discourage overdrafts which occur within the lowered caps.

Experience indicates that current operational differences between Fedwire and CHIPS (such as standard CHIPS message formats which allow for greater automation) are more important than price differences when choosing between networks. Thus pricing Fedwire overdrafts need not significantly shift payment risks from one network to the other. In addition, the existing system of bilateral net credit limits and network-specific caps may limit any increases in CHIPS systemic risk as a result of Fedwire pricing.

If pricing were implemented in the future, a low initial price might be advisable. This could give DIs an opportunity to adopt institutional changes which reduce overdrafts in an environment which provides these incentives but minimizes potential disruption. For example, an initial price of 10 basis points (annual rate) could be applied to each day's maximum Fedwire daylight overdraft. If the duration of Fedwire overdrafts by a DI during a day exceeded 3 hours (the current average duration of Fedwire overdrafts), the charge applied to the maximum overdraft could be raised to some higher amount, say to 20 basis points.

The illustrative 10 basis point price is much less than the 100 to 125 basis point (annual rate) price that might develop if a private market in intraday funds were to be established. Over time as experience is gained, Reserve Banks could raise the overdraft price up to or above what might otherwise exist in a private market. The private sector could then take over the function of providing intraday credit to fund remaining overdrafts. In any case, pricing Fedwire overdrafts would not be considered to be a priced service giving DIs the "right" to incur overdrafts because they pay for them. Rather, such pricing may be viewed as a penalty fee on a practice which is being discouraged and DIs would still be expected to operate within their existing net debit cap.

If the initial Fedwire price for current funds only daylight overdrafts were 10 basis points, the cost incurred by all DIs at existing levels of overdrafts would today total \$34.7 million annually or \$708 per million of overdrafts per year. On a daily basis, overdrafting DIs could be paying an aggregate total amount of \$136,000 per business day. For those 25 institutions with the largest average Fedwire overdrafts, a price or penalty fee of 10 basis points could initially cost between \$1,150 to \$16,900 per working day. Such a charge could provide an incentive for institutions to adopt less costly changes in intraday

funding operations which would reduce overdrafts and hence the cost of incurring them on Fedwire.

In charging for overdrafts, it may be difficult for Reserve Banks always accurately to determine the effects that their computer outages and other operational problems may have on the daylight overdraft values computed. While some improvements in monitoring accuracy are possible and are to be implemented soon, it may not be cost effective to obtain 100 percent accuracy. As an alternative, guidelines could be developed to assure uniformity in DI overdraft treatment when Reserve Bank outages occur so that DIs are not unfairly charged. Yet another possibility would be not to charge for Fedwire overdrafts that are less than 25 percent of a DI's capital if it can be reasonably shown that such an exclusion approximates the average effect of Reserve Bank operational problems on DIs over time. An exclusion of this type would, on average, compensate DIs for overdraft charges associated with inaccurate Federal Reserve overdraft measurements and/or overdrafts caused by computer outages. It would also reduce the number of DIs charged by 95 percent because only 136 institutions, who account for 87 percent of all Fedwire overdrafts, regularly incur overdrafts larger than one fourth of their capital.

II. Background.

Market Pricing Of Daylight Overdrafts. Cross-system sender net debit caps have been adopted by depository institutions (DIs) on a voluntary basis. In addition, network-specific net debit caps as well as bilateral net credit limits are required on privately operated large dollar networks that settle on a Reserve Bank's books. To date, no intraday funds market that would permit DIs to avoid daylight overdrafts has developed, and overdrafts have not been explicitly priced. This is not surprising because the current system of caps

was designed initially to constrain only those DIs with the largest overdrafts and to reduce the aggregate dollar value of daylight overdrafts by only 5 to 7 percent. For the vast majority of institutions, therefore, caps have not been binding, nor will they be under the Board's revised caps now out for public comment. A second factor is that less costly alternatives to purchasing intraday funds have been available, especially rearranging the timing of nonessential customer payments during the day to reduce overdrafts. This has lowered overdrafts from what they might otherwise have been, based solely on the growth of the value of payments sent over large dollar networks.¹

Two areas in the banking industry do, however, exhibit some characteristics of an intraday market. These are:

- (1) Day loans to security broker/dealers; and,
- (2) Intraday funding associated with the market for overnight funds.

Day loans are advanced by banks to securities dealers and brokers in order to permit payment by certified check to sellers at the time of delivery. Such loans are granted for periods less than a day (six hours or less), are expected to be repaid by the close of business, and typically cost 100 basis points (annual rate). Although collateralized by the underlying securities so that a perfected security interest is obtained through the loan agreement, day loans are typically regarded as unsecured due to the difficulty of obtaining control over the securities. Day loans developed because of: (a) statutes prohibiting the certification of checks drawn on accounts containing insufficient funds; (b) the lag between the time broker/dealers pay for securities, subsequently deliver

¹Earlier analysis suggested that the ratio of daylight overdraft value to total value of payments sent was constant, so both could be expected to grow at about the same annual rate.

them to customers, and receive payment from them; and (c) the large securities purchases involved exceed broker/dealer working capital. An appendix provides more information on this market, which is largely restricted to New York.

The overnight market for federal funds experiences rate fluctuations throughout the day. Even if a DI starts the day with good information on its funding requirements, it is often necessary to enter the market several times during the day to deal with contingencies that had not been anticipated. Institutions may purchase funds in the morning only to find, later in the day, they are not needed overnight and must be sold in the afternoon. It is in this restricted sense that an intraday interbank market already exists, but to our knowledge it is not yet being used specifically to fund interbank daylight overdrafts.¹

Industry Position On Pricing Daylight Overdrafts. The banking industry has not as yet given pricing of daylight overdrafts with their customers or Reserve Banks a great deal of thought and analysis. The pricing of daylight overdrafts was a collateral issue raised in an Association of Reserve City Bankers (ARCB) report on payments risk reduction issues. In this report,² the ARCB stated the following about the possibility of pricing funds transfer daylight overdrafts above a cap:

¹The average opening federal funds rate over 1984-85 was 9.137 percent while the average (early) closing rate was slightly lower at 9.117 percent. On average, borrowing in the morning and reselling the funds in the afternoon could cost 2.0 basis points, neglecting transactions costs. If borrowing in the morning is paired with reselling of funds at the end of the day, when the market is thin, the average difference in rates turns negative, to -14.62 basis points. The spread between opening and closing rates would likely be positive, however, if such an approach to intraday funding of daylight overdrafts were attempted by more than just a few DIs.

²Association of Reserve City Bankers, Risks in the Electronic Payments System, October 1983.

Intra-day Funding ... If the participant requires amounts in excess of its normal intraday overdraft limit at the Fed ... it could obtain funds by borrowing from the Federal Reserve and collateralizing that borrowing [p. 25].

A second ARCB report¹ concerning U.S. government book-entry security transfer daylight overdrafts concluded that collateralization was the preferred alternative but if the choice were between caps and pricing all securities overdrafts then:

Fed pricing of overdrafts is preferable to a caps system. It provides a more reliable and more easily managed source of funding, and avoids the artificial and meaningless exercise of setting a high capital multiplier so that book-entry transactions could continue at desired levels. Pricing would provide a general incentive to minimize all overdrafts rather than those over a cap. Pricing is a more flexible and equitable tool than caps, and it does not preclude the development of an intraday market in funds at a rate below the Fed price [p. 6, emphasis added].

Fed pricing should start with a low price, say 10 basis points, which could be adjusted gradually over time. [As an offset to this price,] the Treasury should consider improving the terms for clearing banks on Tax and Loan accounts [p. 7].

Earlier Board Positions On Pricing Fedwire Daylight Overdrafts. While pricing represents a potentially effective way to induce reductions in daylight overdrafts, it was previously rejected by the Board in favor of a system of caps that would constrain overdrafts across all payment networks. The reasons for rejection were: (a) there was no clear method to use in setting the price for intraday credit on Fedwire; and (b), the exact effects of particular prices charged for overdrafts are uncertain since the slope of the "demand curve" for overdrafts is unknown.² In particular, it was felt that payments risk would merely shift between networks and not be reduced. In a later analysis, these concerns were summarized as:

¹ Association of Reserve City Bankers, Report of the Working Group of the Association of Reserve City Bankers on Book-Entry Daylight Overdraft, June 1986.

² Board of Governors of the Federal Reserve System, "Risk on Large Dollar Transfer Systems", February 1984, pp. 64-6.

charging for intraday credit was tentatively rejected because of the difficulties of determining a price and, if one could be determined, the difficulties of requiring that it be imposed by private wire systems.

At the time, it was important to impose the same type of controls over the use of Fedwire and alternative wire transfer networks. Pricing Fedwire overdrafts but not those on CHIPS could shift Federal Reserve credit risk to CHIPS, increase CHIPS overdrafts, and thus increase overall systemic risk. The existence of binding sender net debit caps on CHIPS today reduces the likelihood that payments risks will be shifted from one network to another.

III. Pricing Daylight Overdrafts.

Currently, daylight overdrafts are not priced on Fedwire. And, as far as is known, participants using CHIPS do not charge one another to receive payments which may exceed a receiver's established bilateral net credit limit. Under the cross-system caps now in place, however, an indirect or "shadow" price does exist for overdrafts over a certain level.² The shadow price is the cost incurred when caps are actually or would otherwise be exceeded. This cost can involve not only being counseled for incurring overdrafts that exceed the cap, but also the expectation of more stringent action if excessive overdrafts are incurred regularly. Alternatively, the cost may equal the out-of-pocket expenses associated with adopting institutional changes that reduce overdrafts. For example, in order to avoid excess overdrafts DIs may use rollovers of overnight funding or else shift from overnight funding to term or continuing

¹Board of Governors of the Federal Reserve System, "Reducing Risk on Large Dollar Transfer Systems", May 1985, p. 22.

²DIs may directly or indirectly charge customers for extensions of daylight credit provided to them but are not themselves directly charged for interbank daylight extensions of credit.

contracts. The shadow price increases as overdrafts approach the caps, necessitating closer monitoring. In addition, if caps are reduced, more overdrafts would become subject to the shadow price.

Today, the extent to which DIs have adopted institutional change to reduce overdrafts is largely determined by the costs associated with being counseled, along with moral suasion from regulatory authorities and the desire by an institution's management to reduce risk. If in the Board's opinion institutional changes that reduce overdrafts should be further encouraged, one of three basic approaches could be followed. First, the cross-system cap could be reduced to markedly lower levels. Second, caps could be abolished and replaced by pricing all daylight overdrafts. Finally, caps can remain at current or lower levels and augmented with direct pricing of all daylight overdrafts covered by caps.

Unless caps are dropped sharply, the first possibility would likely reduce overdrafts by only modest amounts since caps are only fully used by a few institutions and the amount of overdrafts above even a sharply reduced cap are relatively small. Thus, even large reductions in caps would provide little incentive to further limit those overdrafts within the boundaries of the caps. The second possibility, where pricing replaces caps, could make all overdrafts costly but would seemingly permit any level of overdrafts so long as the price were paid. Such a policy could give users the incorrect impression that the current level of daylight overdrafts is acceptable while the Board's policy is that overdrafts should be reduced significantly.¹

The final possibility, which combines pricing with caps, provides for strict limits on overdrafts within the caps while making all overdrafts within the caps

¹"Reduction of Payments System Risk: A Manual for Depository Institutions," November 1985, p. C-3.

costly to those who incur them. The combination of caps and pricing suggests that direct pricing of overdrafts can serve as either a substitute for or complement to future cap reductions in the sense that both pricing and caps provide inducements to reduce overdraft levels.

Pricing Fedwire overdrafts cannot be considered in isolation from its effect on CHIPS. Pricing on Fedwire alone, without bilateral credit limits or caps on CHIPS, could have resulted in a significant shift of Federal Reserve credit risk to CHIPS, increasing systemic risk. Because bilateral credit limits and caps are now in place, however, it should now be possible to price Fedwire overdrafts without materially increasing systemic risk on CHIPS. In addition, experience indicates that current operational differences between Fedwire and CHIPS, such as standard CHIPS message formats which allow for greater automation, appear to dominate price differences when choosing networks.

Arguments For Pricing Fedwire Daylight Overdrafts. The major benefits from pricing Fedwire daylight overdrafts can be summarized as:

- (1) Pricing creates additional incentives for users to reduce overdrafts through continued operational improvements (such as real time monitoring systems and reduced computer downtime) and institutional change (such as funds rollovers, shifts to continuing contracts, and netting of underlying obligations by novation);
- (2) Pricing provides participants more flexibility in making payments than does an equivalent incentive brought about by a reduction in caps;
- (3) Pricing generates revenues to compensate for the credit risk and related expenses faced by Reserve Banks. These costs, which can include some bank examination expenses which also serve to reduce Reserve Bank risk exposure, are not now included in the current Fedwire price; and,
- (4) Pricing enhances equity by placing costs on those who generate the risks and enjoy the benefits of the payments system.

The first benefit is the most important since it could provide additional incentives for Fedwire users to continue to implement changes that reduce their overdrafts, a clear long-run solution to the payment risk problem. The second

benefit accrues mainly to Fedwire users. While similar incentives to reduce overdrafts can in principle be achieved by reducing caps to some lower level, the pricing alternative provides more flexibility for participants.¹ If the overdraft price is not prohibitively high, the least costly alternative for DIs under such a policy may initially be to pay the cost of incurring an overdraft within the current cap while working to reduce them in the future. In contrast, the costs of implementing procedures to reduce overdrafts immediately to meet a lower cap level may be much larger compared to a policy of pricing that allows an institution to choose the least costly option.

The last two arguments for pricing are consistent with comments made earlier by the Justice Department² which suggested that the Federal Reserve attempt to price its provision of payments finality on Fedwire. Provision of payments finality provides value to users since Reserve Banks absorb the credit risk of Fedwire overdrafts. The Justice Department noted that:

...the Federal Reserve in effect guarantees FedWire funds transfers without charging for this valuable insurance feature. Were the private wire networks to provide a similar insurance service, perhaps in the form of settlement insurance or fees for intra-day extensions of credit, the cost of that service would presumably be included in the fees charged the networks. Thus, while we are aware that the service may be a difficult one to price, the Department urges the Board to give serious consideration to pricing the competitively important insurance service it provides on all FedWire transfers [p. 35].

Problems With Pricing. It is difficult to determine the "right" price to charge for Fedwire daylight overdrafts. If the price is set too low, little

¹This is true as long as the perceived cost of exceeding the caps, such as the likelihood that the system of voluntary caps would be replaced with regulatorily set mandatory caps if current voluntary cap levels were consistently exceeded, is significant.

²U.S. Department of Justice, "Comments on Proposals to Reduce Risk on Large-Dollar Transfer Systems", Docket No. R-0515, November 15, 1984, pp. 34-5.

incentive is generated for DIs to limit overdrafts, although it is hard to understand how a price could have no effect at all. If the price is set too high, then institutions may be "overconstrained", and payments and financial markets disrupted just as they would be if caps were set too low. The solution may be to phase in a pricing program starting with a low price (say 10 basis points) and then raise it over time until the desired effect is obtained.

In order to ensure that the burden of a daylight overdraft fee is borne by those who generate risks, the fee should be a percentage of the overdraft incurred rather than a simple markup blended into the price of a Fedwire transaction. Otherwise, there would be little if any incentive to reduce overdrafts. In addition, a choice should be made between a flat fee based on the maximum overdraft incurred that day,¹ regardless of the duration of the overdraft, and a fee that varies with the duration of the intraday credit exposure, like a per hour price. A flat fee may be less complex to implement but would do little to encourage DIs to reduce the duration of their overdrafts. Alternatively, if an hourly charge were used, institutions would have incentives to cover overdrafts as soon as possible. Given current operational capabilities discussed below, however, a one hour time period might be too short to start with.

A compromise solution which incorporates the above concepts but remains simple to administer and understand could be:

¹There are two reasons why it may be better to price overdrafts on their maximum value rather than their average size during the day. First, two DIs with the same average overdraft can present quite different risks to the payments system. A DI which incurs an average overdraft of 1.0 times capital based on a relatively constant overdraft over the day is less risky than a DI having the same average overdraft but with a fluctuation during the day between 2.0 and 0.5 times capital. Use of the average overdraft approach rather than using the maximum value neglects these differences in risk. Second, the focus of the current counseling effort is on the daily maximum overdraft, not the average during the day. Even the two-week average cap calculation involves the average of daily maximum values.

- (a) Standard Price: the overdraft price is based on the maximum Fedwire daylight overdraft incurred during the day; and,
- (b) Duration Adjustment: if the total time an institution is in any overdraft during the day exceeds three hours, which is the average duration of a Fedwire overdraft, the price is raised to double the initial fee.

With this pricing approach, only two elements need to be known--the maximum overdraft incurred each day and the total time the institution was in any overdraft. If the total time of a DI's overdrafts during the day was less than three hours, there would be no duration adjustment and the standard price could apply. And, since the total value of the maximum daily overdraft would be subject to a charge, prices need not distinguish between overdrafts which are below or above the daily cap. This distinction should continue to be enforced by the cap.¹

A second potential problem with pricing Fedwire overdrafts is that it involves adverse selection problems common to insurance. According to this argument, pricing overdrafts could lead less risky DIs to seek out lower cost alternate suppliers of intraday funds while more risky DIs continue to pay the price at Reserve Banks. This can result in a group of overdrafting DIs on Fedwire that are more risky on average than before. It does not appear that this problem would be serious, however. First, if some DIs refrain from overdrafting, the overall level of risk to the system should fall from what it is today, even if the more risky DIs continue to overdraft and pay the Fedwire charges. If overdrafts are not priced, risky DIs will still overdraft at least as much or more within the caps as they would in a priced system. Thus the adverse selection problem associated with pricing should not be very

¹There is no reason to apply additional charges to overdrafts measured over two weeks since a DI would already be charged for daily overdrafts over the same time period.

significant. Second, DIs that present more risk should have lower caps if they have in fact followed the guidelines set out in the self-assessment program which determines cap selection. If the more risky DIs remain on Fedwire after pricing, they should also have lower caps and overdrafts, on average, than existed previously. This may be a good reason to combine caps with pricing, rather than use either one alone.

A third objection to pricing is that caps are more likely to constrain overdrafts than is pricing. Since caps contemplate overdrafts up to a limit but no further, they should only be preferred to pricing if the sole objective of the risk control program is to limit the level of overdrafts. If in addition the total costs to all parties in the payments system should be minimized as overdrafts are being reduced, then pricing along with caps may be preferred because of the choice given to the overdrafting DI--to incur costly overdrafts or to incur costs to reduce them.

A corollary to the argument that caps are more likely than pricing to constrain overdrafts is that pricing might create an atmosphere of entitlement to daylight overdrafts and therefore act to condone them. This argument is valid if pricing is compared to a policy that totally forbids overdrafts. The choice implicit in this paper, however, is between a policy that places a penalty or disincentive fee on overdrafts within a cap and a policy that permits unpriced overdrafts within a cap. Since the former policy places higher costs on overdrafters than does the latter, and contains the same restrictions as the latter, pricing would appear to create less of an entitlement than does the alternative. Further, under pricing the option of additional moral suasion or cap reductions would still be available. Thus the pricing of daylight overdrafts on Fedwire need not connote a "right" to such overdrafts even if the price were paid. Instead, such pricing could be viewed as a penalty fee intended to discourage an undesirable practice.

Finally, pricing as well as binding caps may lead to some redistribution of payments volume among institutions. Binding caps could cause a redistribution from some institutions with no excess cap capacity to others with sufficient capital or unused cap capacity to accommodate the volume. Similarly, pricing could redistribute payments volume from DIs on whom overdraft charges are a significant burden toward those who may have excess cap capacity or have reduced overdrafts through earlier adoption of institutional changes. Redistribution of payments volume may have both negative and positive aspects. On the negative side, the payments system may seemingly become more "fragmented" in that payments may be spread among a larger number of originating institutions. On the positive side, by redistributing payments volume toward DIs that have sufficient capital or excess cap capacity or are able to avoid overdrafts by implementing institutional changes, and away from those who have in the past relied heavily on overdrafts, overall payments system risk should decrease.

Effects Of Pricing. Pricing of Fedwire overdrafts could apply to any overdraft subject to what can be regarded as the Fedwire cap. Currently the Fedwire cap is an institution's cross-system cap less any net debit position on private wire systems, and covers all funds transfer daylight overdrafts in its reserve or clearing account. Overdrafts can arise from wire transfers of funds, ACH, and checks presented by Reserve Banks, plus net settlement entries for payments processed outside the Federal Reserve but settled using reserve or clearing accounts. Pricing could also apply to uncollateralized U.S. government book-entry securities daylight overdrafts (plus any discount or "haircut" applied to securities used for securities overdraft collateral) if they were to be made subject to the cap in the future, as suggested in a proposal now out for public comment. Alternatively, pricing could apply to all overdrafts, both funds transfer and all security-related overdrafts, perhaps using differential fees for security overdrafts that are collateralized.

Pricing all Fedwire overdrafts would provide incentives for DIs to develop and take further actions that reduce overdrafts. These actions are relatively well-known and involve both a reduction in the value of daily payments sent over wire transfer networks and an elimination of the current gap in processing time between totally or partially offsetting payments:

- (1) Rollovers where the same amount of overnight (or longer) funds borrowing is renegotiated with the same seller. No funds move over the wire networks except the initial borrowing and the final repayment. Importantly, there is no time gap between daily repayment of borrowed funds and receipt of borrowings for the next time period. As a result, the value of payments over wire networks is reduced, the time gap is eliminated, and associated daylight overdrafts fall;
- (2) Continuing contracts where differing amounts of daily funds borrowings are renegotiated with the same sellers but only the net change in the position (including interest) is sent over the wire. The value of the single net transfer is less than either the full repayment early in the day of the gross funds borrowed or the full reborrowing later in the day of an altered gross amount for the next period. The value of payments made is thus reduced and the time gap between the two gross flows eliminated, so overdrafts fall;
- (3) Term funds where longer-term borrowings are substituted for overnight funding. Overdrafts fall due to the lower average daily value of funds sent and returned over the wire network, as well as the now more infrequent daily time gap between return of borrowed funds and subsequent reborrowing;
- (4) Intraday funding where excess funds or even unused overdraft cap capacity are sold and sent to other payments participants to fund, for a price, what otherwise would be daylight overdrafts at the purchasing institution; and,
- (5) Netting by novation where gross bilateral payment obligations between DIs are netted prior to the value or settlement date. Exposure is reduced from gross to net positions so that payments satisfying these obligations over the wire are reduced. Even though a time gap may remain, both measured overdrafts and risk decrease.

The first three procedures have existed prior to the Federal Reserve's risk reduction program and anecdotal information indicates that they are being pursued more intensively than before. In addition, the American Bankers Association has formally supported the first two actions--rollovers and continuing contracts--which could be used to reduce overdrafts.

The fourth method, intraday funding, has not been used to reduce overdrafts as far as is known. Furthermore, it is not likely to be used under current conditions due to the extra costs that could be incurred relative to other overdraft reduction alternatives and because of the extra operational efforts associated with using intraday funds. For example, an intraday funds market would probably require more certainty of timely Fedwire delivery than now exists.

However, if Fedwire pricing were adopted (and/or caps reduced) and the price were high enough (or the cap low enough), an active market in intraday funds could well develop. Offering a priority Fedwire message service that could consistently assure timely delivery and circumvent computer downtime problems would further assist the development of such a market. The existence of an interbank market for intraday funds might induce DIs to price daylight overdrafts extended to their customers. Similarly, pricing by the Federal Reserve could lead to pricing by DIs, so that customers could eventually end up paying some or all of the Fedwire overdraft fees. The extent to which Fedwire fees imposed on DIs are passed on to customers depends on the elasticities of customer demand and the elasticity of DI supply for payment services.¹

The fifth method--netting by novation--is currently in the experimental stage. Agreements providing for this type of netting will soon become operational in the London forward foreign exchange market and there are plans

¹Pricing Fedwire overdrafts could, of course, also provide inducements to reduce securities transfer overdrafts if some portion of these overdrafts were covered by the current system of caps. The institutional changes pricing could bring about in the securities area are discussed in the book-entry daylight overdrafts proposal now out for public comment. These changes involve increased use of securities netting prior to securities being moved over Fedwire, reduction in position building by dealers (essentially reducing the overdraft creating time gap between purchase of securities and redelivery), and netting by novation for certain types of securities trades.

for their possible application to certain types of transactions over CHIPS. There has been no known netting by novation application on Fedwire but it is possible that certain transactions could be handled in this manner.

It is important to note that earlier staff analyses in 1980 and 1982 indicated that upwards of 80 percent of all Fedwire funds transfer plus securities transfer daylight overdrafts at large banks could be eliminated if certain percentages of interbank overnight borrowing were shifted to term borrowing or multi-day continuing contracts.¹ The percentages are of course higher for those banks that had incurred large total overdrafts. The large banks studied were those with deposits of \$1 billion or more. At that time, these banks accounted for over 90 percent of all funds and security transfer overdrafts. At one-half of these banks, 25 percent of overnight funding would have to shift to term funding to eliminate all of their overdrafts. At one-eighth of the banks, the necessary percentage shift was over 100 percent. All remaining banks were between these two extremes.

The required percentage shifts are on average reduced to 8 and 33 percent (a two-thirds reduction), however, if all securities transfer overdrafts are excluded from the analysis. But if some portion of securities overdrafts are included under a revised system of caps, the above percentage shifts from overnight to term funding are more likely to be 13 percent and 50 percent (a one-half reduction). Although approximate, this result demonstrates that adoption of some or all of the five actions listed earlier may be sufficient to virtually eliminate overdrafts which would be subject to the (revised) Fedwire

¹ These studies are summarized in The U.S. Payments System: Costs, Pricing, Competition and Risk, Monograph Series in Finance and Economics, no. 1984-1/2. Graduate School of Business Administration, New York University, 1984, pp. 86-89.

cap if strong inducements were available to have these actions adopted on a more widespread basis.

IV. Determining The Price To Charge.

Banks commonly charge broker/dealers for the total value of intraday credit. The charge does not vary according to the number of hours the loan is outstanding. The "Standard Price" discussed above for a Fedwire overdraft is based on this precedent. Further, in order to reduce overdraft durations, the Standard Price could be doubled if the total time a DI is in overdraft during a day exceeds three hours (Duration Adjustment). This two-step pricing arrangement effectively prices overdrafts in three hour increments.

Approximating The Long-Run Standard Price. At least five methods could be used to determine an appropriate Standard Price for three-hour increments of Fedwire overdrafts. Unfortunately, many of them have serious defects and reasonable men may differ as to the validity of any one approach. These methods are:

- (1) Existing Intraday Market Rate: A small (perhaps around \$10 billion) market for intraday funds exists today for broker/dealers, who need to finance security purchases prior to delivery and payment by customers. While there is some variation in this intraday rate, reflecting the risk of the securities being issued and being used as collateral for the loan, the rate has little variation over time and is typically 100 basis points (on an annual basis);
- (2) Costs Of Shifting From Overnight To Term Funding: The differential cost of overnight funding (which typically creates daylight overdrafts) and term funding (where overdrafts can be reduced) can represent the costs involved in using one simple method to reduce daylight overdrafts. This cost, which has averaged -2.2 basis points on an annual basis over 120 weeks during 1984-86, indicates that 7-day term federal funds are, on average, cheaper than overnight funding. The spread averages 4.5 basis points when 30-day term federal funds are compared to overnight funding.¹ While the current cost of shifting from overnight to term

¹The term funding data only exist for one DI, so generalization here may be inappropriate.

funds is -2.2 to 4.5 basis points, such a low rate is unlikely to persist if large numbers of DIs use this approach to reducing their daylight exposures;

- (3) Divide The 24 Hour Overnight Rate By Eight To Obtain A Three-Hour Rate: This ad hoc procedure yields 124 basis points (annual rate) for an implied three-hour overdraft rate based on the 9.91 percent average overnight federal funds rate over the last 10 years (1976-85). This approach effectively assumes that funds can be lent out in eight three-hour increments or that daylight lending does not inhibit overnight use of the same funds by a different borrower;
- (4) Extrapolate The Yield Curve Backwards To A Three-Hour Rate: Statistical estimation of a yield curve over 180-day, 90-day, and 30-day bank CDs, and overnight federal funds, gives an implied average three-hour overdraft rate of 9.74 percent. This is only 17 basis points lower than the average overnight rate over the last 10 years. The estimated yield curve is very flat and spreads between instruments often shift from positive to negative over time. This approach gives results equivalent to situations where daylight lending would prevent use of the same funds overnight; and,
- (5) Risk Premium Between Bank CDs And Treasury Bills: Over the last 10 years, the risk premium has averaged 107 basis points for 30-day instruments, which is the shortest original maturity available for bank CDs. Since this premium actually falls for longer maturity instruments,¹ it is at least possible that a three-hour risk premium (which does not exist) could be greater than or equal to that for the 30-day instrument.

Problems exist with all of these approaches. For example, in the first method the broker/dealer intraday funds rate of 100 basis points represents a market rate on a secured intraday loan of about six hours, while Fedwire overdrafts subject to the cap are unsecured and typically average around three hours a day (for all overdrafting institutions).² Although intraday loans may be secured, the arrangements used are loose enough that these loans are usually treated as

¹For 90-day instruments, the 10 year average (1976-85) risk premium is 77 basis points, while for six month instruments the premium is only 57 basis points. Data are from T. Rowe, T. Lawler, and T. Cook, "Treasury Bill Versus Private Money Market Yield Curves", Working Paper, Federal Reserve Bank of Richmond, July 1986, Table I.

²The average duration of overdrafts for large institutions (those with assets of \$5 billion or more and who today account for 90 percent of all funds transfer overdrafts) is four hours, while that for all DIs is three hours. The average duration of overdrafts within 90 percent of each day's peak overdraft is about 1.5 hours for all institutions and .75 hour for large institutions.

unsecured credits by the banks that make them. The time difference, however, is more significant, since Fedwire overdrafts are shorter on average than broker/dealer loans.¹

The problems with the second method are more serious. While the cost of shifting from overnight to term funding can be observed in the market (unlike a hypothetical completely unsecured three-hour intraday loan rate), this -2.2 to 4.5 basis point average spread is likely to change significantly if many DIS seek this method to reduce overdrafts. At present these spreads fluctuate from positive to negative at different points in the interest rate cycle and thus appear to be more a function of interest rate expectations than they are of the lower liquidity and higher default risk on the term instrument. If more DIS turn to term funds as a substitute for overnight funds to reduce daylight overdrafts, the observed spread should rise and the relative effect of interest rate expectations on the demand for term or overnight funds should fall. Thus, the current small basis point spread between term and overnight federal funds understates the spread that would likely be observed if this method of reducing overdrafts became popular.

The last three methods involve ad hoc or statistical extrapolation to an unobserved maturity region (three hours). This necessarily generates a certain amount of error even if the assumptions about the extrapolation process are accepted. The third and fourth methods generate overdraft price estimates which differ markedly, from 124 to 974 basis points. Method 3 implicitly assumes that funds lent to cover intraday overdrafts can be reused overnight (as in a private

¹Since broker/dealers purchase other services from lending banks in addition to intraday loans, these loans may be priced as part of a package of jointly produced services. Thus the observed 100 basis point intraday loan rate may or may not equal the rate which would exist if fewer related services were purchased, as could exist in a market for interbank intraday funding for daylight overdrafts.

market). In this case, the daylight overdraft rate has a lower bound of 124 basis points. Method 4, in contrast, assumes that intraday funds cannot be used again overnight. Here, the daylight overdraft rate would have an upper bound very close to the overnight rate, or 974 basis points. Since it is expected that interbank funds borrowed to cover daylight overdrafts could be relent overnight to the same or a different borrower, the 124 basis point estimate is the more accurate of the two so the higher rate of 974 basis points can be neglected. Finally, the last method uses the current observed risk premium between 30-day bank CDs and U.S. Treasury bills to approximate an overdraft price which reflects the potential average risk involved in making an intraday loan to a DI. This risk premium of 107 basis points, however, is also affected by the different tax treatment of income from the two instruments as well as by their differing liquidity in secondary markets.

Of the five alternative methods of estimating the intraday price for funds presented above, the second (shifting from overnight to term funding) and fourth (based on an estimated yield curve) should be neglected. Shifting from overnight to term funding is excluded because the currently measured costs are too low (or negative) to be representative of what the costs would likely be if many DIs used this action to reduce overdrafts. The yield curve results are excluded because they imply that funds lent intraday would not be relent overnight, which raises the rate charged on an intraday loan to a level very close to the overnight rate. Since intraday funds could be relent overnight if a private intraday funds market were to develop, the rate obtained from the estimated yield curve is unrealistically high. The remaining three methods (1, 3, and 5) give rates which cluster around one another at 100, 124, and 107 basis points (respectively). As a result, a best guess of an equilibrium rate which would apply to daylight overdrafts if a private market were to develop would lie in

the range of 100 to 125 basis points.¹

While it would be possible to use this best guess as an initial price for Fedwire overdrafts, a more cautious approach would be to start pricing at some very low intraday rate, say 10 basis points (annual rate), and slowly but regularly raise it to higher levels over time as more experience is gained with pricing. Following a detailed assessment of the market reaction to pricing and the effect it has on overdraft levels, the price could be adjusted upward.

Possible Effect Of Pricing On Depository Institutions. Fedwire funds transfer daylight overdrafts averaged \$49 billion a day over December 20, 1984, to July 30, 1986 (while CHIPS overdrafts averaged \$45 billion a day and securities transfer overdrafts were \$47 billion).² At a Fedwire overdraft price of 100 basis points, the initial annual cost to all Fedwire overdrafting institutions would total \$347 million (= \$49 billion times .01 times (255 working days/360)), or \$7,080 per one million in overdrafts per year. On a daily basis, this is \$1.36 million per working day for all overdrafting DIs. With 10 basis points as the initial overdraft price, the overdraft cost is \$34.7 million for all institutions, or \$708 per million in overdrafts per year. Here overdrafting institutions would pay an aggregate of \$136,000 thousand each working day.

For those 25 institutions with the largest average Fedwire overdrafts, the cost could be substantial if current overdraft levels were to continue despite

¹This is just a guess because (1) there is no literature on determining an intraday rate, (2) empirical observations or statistical estimates of what an intraday rate is or could be have the defect that intraday money is currently free to the lender and hence does not affect the rate charged to borrowers, and (3) markets will change when intraday money has a time value.

²Adding the Fedwire maximum overdraft to that for CHIPS will yield a figure that is larger than the value associated with the cross-system cap (\$78 billion over the same time period) because the peak overdraft values occur at different times on the two networks.

the fee. When a price of 10 basis points is charged, the cost of overdrafts per working day ranges from \$1,150 to \$16,900. The cost per year ranges from \$293,000 to \$4.3 million. If a duration adjustment were added to double the charge for institutions in overdraft more than three hours, cost for the same institutions would range from \$1,260 to \$33,760 per working day, or from \$321,000 to \$8.6 million per year.

These illustrative daylight overdraft costs for Fedwire users are based on current levels of funds transfer overdrafts and could be higher if, as proposed, uncollateralized security transfer overdrafts were made subject to the cap as well. But more importantly, there is every reason to believe that some or all of the above mentioned institutional changes would be used more intensively than they are today to reduce overdrafts if pricing were adopted. It is also expected that all of these interbank overdraft costs would be eventually passed on to those customers and internal bank profit centers which create, by their current payment practices, the problem to begin with, thus providing the incentives needed for overdraft reducing institutional change or cost recovery from customers.

V. Administrative Issues.

The Legal Basis For Pricing Fedwire Daylight Overdrafts. The Federal Reserve System has authority to charge for Fedwire daylight overdrafts under section 4, paragraph 4 (seventh) of the Federal Reserve Act which states that the Reserve Banks may exercise "such incidental powers as shall be necessary to carry on the business of banking within the limitations prescribed by [the Federal Reserve Act]" ("the incidental powers clause"). Under the incidental powers clause, the legal basis for pricing daylight overdrafts is similar to and hinges on the legal basis for allowing daylight overdrafts. Essentially day-

light overdrafts are by-products of the Reserve Banks' payment functions which occur as the Reserve Banks process payments and must be covered by the end of the day.

Generally, the Federal Reserve Banks have incidental powers when such powers are required to meet the legitimate demands of their authorized business and to enable the Reserve Banks to conduct their affairs within the general scope their charter safely and prudently. (E.g., Lucas v. Federal Reserve Bank of Richmond, 59 F.2d 617 (4th Cir. 1932)). Currently, permitting daylight overdrafts is necessary for the Reserve Banks to conduct their payment functions effectively. Controlled overdrafts are consistent with the safe and prudent discharge of these functions.

The authority to charge for daylight overdrafts flows from the authority to allow such overdrafts. As noted previously, charging for daylight overdrafts would discourage overdrafts within cap limits and thereby reduce Federal Reserve risk. Accordingly, charging for daylight overdrafts, and overnight overdrafts as now is done, enhances the Reserve Banks' ability to perform their payment functions safely and prudently and therefore meets the requirement for basing authority on the incidental powers clause.

Operational Considerations. Assessing a fee for daylight overdrafts requires a highly accurate system to account for all payments flowing through Reserve Bank reserve and clearing accounts. In addition, the system should accurately reflect the time at which funds are available for use by DIs and the time at which payments are made by them.

Currently, the ex post monitoring system used to calculate the level and duration of Fedwire daylight overdrafts does not always accurately reflect the timing of certain transactions, such as check-related and ACH-related debits and credits. As a result, daylight overdrafts observed in the ex post monitor may,

in fact, not have been experienced under a real time system or vice versa. Further, balances for funds and securities transfer activity are calculated at 15-minute intervals rather than posting transactions continuously. Over the long run, this approach provides an accurate representation of the average level and duration of daylight overdrafts. But on any particular day, the computed individual balances may over- or understate actual daylight overdrafts compared with continuous posting.

More importantly, there are occasional outages of Fedwire operating systems and processing and accounting errors can affect DI intraday reserve or clearing account balances. When outages occur, transfers cannot be sent from or received by the Reserve Bank. As a result, DIs may incur overdrafts they would not have incurred had the system been fully operational. Reserve Banks currently consider operating outages when their staffs review overdraft data and when these institutions are counselled. If prices were assessed for Fedwire overdrafts, one way to deal with this problem could be to permit Reserve Banks, under standardized guidelines, to waive fees when appropriate. As an alternative approach, no charge could be levied on Fedwire overdrafts that are less than 25 percent of a DI's capital, if research shows that such an exclusion approximates the average effect of Reserve Bank operational problems on DI overdraft values over time.

Even after all practical modifications have been made to the overdraft monitor, consideration might be given to a permanent "deductible" from Fedwire overdrafts subject to charge--say 15 to 25 percent of a DI's capital. This deductible amount could reflect, on average, the effect on measured overdrafts of operational difficulties experienced by Reserve Banks and/or DIs. Such an approach would require an understanding that DIs might from time to time be charged because of events beyond their control but that on average these charges would be offset by their deductible exemption each day.

A deduction for overdrafts up to the first 25 percent of a DI's capital would exempt from an overdraft fee 95 percent of the 3,500 institutions which had Fedwire overdrafts. This, given the current state of the System's capability always accurately to monitor the true value of Fedwire overdrafts incurred, could serve as an initial and temporary exemption until the monitoring accuracy were suitably improved. For the 25 institutions with the highest average Fedwire funds transfer overdrafts, the cost of overdrafts per working day ranges from \$1,150 to \$16,900 without such an adjustment but is reduced to zero to \$13,410 per working day if the exemption is allowed. The 25 percent of capital exemption could also be used in combination with the duration adjustment which raises the price of overdrafts if they exceed three hours. The duration adjusted cost per working day without the 25 percent exemption ranges from \$1,260 to \$33,760 but falls to zero to \$26,810 per working day with the exemption.

Appendix

Broker/Dealer Day Loans

A day loan is advanced to a broker or securities dealer by a clearing bank in order to enable the broker/dealer to obtain a certified check with which to pay for securities so they may be redelivered against payment to customers. Such a loan is granted for a period of less than a day and is expected to be repaid by the close of business. Although collateralized in the technical legal sense by the underlying securities, day loans are typically considered unsecured credits due to the difficulty in taking possession of the securities or otherwise obtaining a more secure perfected security interest in the collateral. If the loan is not repaid by close of business, the day loan must be repaid by an overnight loan, which is charged at the broker call loan rate.

Day loans arose due to a combination of factors. First, settlement of a securities transaction is customarily made by payment with a certified check. Second, such a transaction involves a lag between payment to the original seller of securities and redelivery against payment from the ultimate buyer. Finally, a check can only be certified if sufficient funds are in the broker/dealer's account at the time he pays for the securities. Day loans make it possible for a check to be certified without requiring the broker or dealer to continuously maintain sufficient working balances, into the ten and hundreds of millions of dollars, to ensure that all securities purchases can be covered out of his own funds. While it seemingly appears that day loans are the result of the convention (and the Depository Trust Company requirement) of using certified rather than cashiers checks for payment, according to bankers contacted for this study even a cashiers check would not be issued for securities purchases unless covered by sufficient funds or a day loan.

Almost all day loans take place in New York because the vast majority of securities transactions occur there. A day loan presupposes the ability of a bank to closely monitor the intraday status of broker/dealer accounts. If such an ability did not exist, it is unclear how a bank would know whether a day loan is necessary to certify a check.

A day loan transaction may work as follows. In the morning, a broker or dealer finds he will need a certain sum to cover a purchase and redelivery of securities to one of his customers. He delivers a note to the lending bank. Granting the loan means that the broker/dealer's account is credited for the amount of the loan and debited for the amount of the certified check. Repayment later that day means that the account is credited for the amount of the customer's payment for the redelivered securities (usually by certified check or wire transfer) and debited for the principle and interest of the day loan.

The price of a day loan is a negotiated rate which consistently hovers around 100 basis points. Since the rate is open to negotiation, it may be as low as 50 or as high as 200 basis points. To the extent that the day loan rate does vary from 100 basis points, however, it is across institutions making the loan rather than over time for any given institution. Further, although some of the bankers contacted for this study felt that the riskiness of an institution issuing the securities could play a small part in determining the day loan rate charged, far more importance was assigned to ability of the price to cover operational and transaction costs, the size of the broker/dealer obtaining the loan, and other factors specific to the relationship between the bank and the broker/dealer.

The relevance of day loans to pricing daylight overdrafts is mixed. On the positive side, it is a rare example of explicitly priced intraday credit. Further, like a daylight overdraft it represents an unfunded extension of

credit. In other words, the lending bank does not have to borrow or generate funds in order to make the loan. Only if the day loan becomes an overnight loan does funding become necessary.

On the negative side, since day loans are negotiated between the bank and its broker as part of an ongoing relationship, there is no separate market for day loans alone. However, there is probably no strong economic reason why day loans could not be unbundled from other bank services. It appears that this simply is not done, perhaps because the payments involved are a tiny part of the total package of broker/dealer services provided by banks. Another negative aspect is that the rate apparently does not change significantly over time for a particular borrower, and so does not by itself seem to reflect changing relationships over time between supply of and demand for intraday credit. Rather, the rate appears to cover the bank transaction costs involved. Finally, the day loan rate is not affected by the number of hours it is outstanding. Whether a day loan lasts one hour or six hours, the same rate is charged the borrower.