FEDERAL RESERVE BANK *of* CHICAGO
FINANCIAL MARKETS GROUP

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Consultation Paper on Intraday Liquidity Management and Payment System Risk Policy

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March 15, 2007

POLICY DISCUSSION PAPER SERIES

FEDERAL RESERVE BANK
OF CHICAGO

MICHAEL H. MOSKOW
President and Chief Executive Officer

March 15, 2007

SENT VIA EMAIL

Ms. Jennifer J. Johnson
Secretary,
Board of Governors of the Federal Reserve System
20th Street and Constitution Avenue, NW
Washington, DC 20551

Re: *Consultation Paper on Intraday Liquidity Management and Payment System Risk Policy*, Docket No. OP-1257 (71 Fed.Reg. 35,679, June 21, 2006).

Dear Ms. Johnson:

The Federal Reserve Bank of Chicago welcomes this opportunity to comment on the *Consultation Paper on Intraday Liquidity Management and Payment System Risk Policy* (the "Consultation Paper"). The Consultation Paper provides new evidence that banks frequently delay the release of large-value Fedwire payments until late in the settlement day. The Federal Reserve Bank of Chicago shares the Board's concern that the increasing pattern of delay ". . . increases the potential magnitude of liquidity dislocation and risk in the financial industry if late-in-the-day operational disruptions should occur" (71 Fed.Reg. 35,680-82), possibly with systemic implications, and that this raises important questions concerning the safety and efficiency of the U.S. payment system.

The enclosed paper, which was prepared by the staff of the Federal Reserve Bank of Chicago, provides specific comments on the Consultation Paper and the proposals discussed therein. The Federal Reserve Bank of Chicago has been aware of persistent, albeit anecdotal, reports that payments associated with exchange-traded settlements, which are both systemically important and time-sensitive, have been routinely delayed. Until recently, however, it has not been possible to evaluate such reports empirically.

Based upon our analysis of confidential data, we can now confirm that there is evidence of late-in-the-day bunching of payments associated with exchange-traded settlements. This evidence corroborates the aggregate findings of the Consultation Paper and suggests that the Board's concerns relating to the timing of Fedwire payments in general is well-founded. More importantly, we believe that the bunching of systemically important payments, such as financial market settlement payments, could have adverse consequences during periods of financial turmoil.

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To address this problem, the Federal Reserve Bank of Chicago endorses changes to the Federal Reserve's Payments System Risk ("PSR") policy that would result in the reduction or elimination of daylight overdraft charges for fully collateralized overdrafts. This recommendation echos the position we articulated in our response to an earlier request for comment in 2001. We believe that the elimination or reduction of daylight overdraft charges for overdrafts that are fully collateralized could help mitigate the problem of end-of-day payments bunching, would have extremely low implementation costs and impose essentially no adaptation costs on the private sector. Regarding the other measures identified in the Consultation Paper, we conclude that they deserve further consideration and study.

I hope you will find the Chicago Reserve Bank's comments on the Consultation Paper useful. If my staff or I may be of further assistance to you, please do not hesitate to contact one of us.

Sincerely,

Michael H. Moskow

Enclosure

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Consultation Paper on Intraday Liquidity Management and Payment System Risk Policy

Board of Governors of the Federal Reserve System

Docket No. OP-1257

Comments Prepared by the Staff of the Federal Reserve Bank of Chicago[1]

1. Introduction and Summary

The Board of Governors of the Federal Reserve System has requested public comment concerning intraday liquidity management and the Federal Reserve's Payments System Risk ("PSR") policy.[2] As noted in the Board's Consultation Paper, there are inherent trade-offs among the Federal Reserve's various public policy objectives relating to the management of credit, liquidity and systemic risks in the U. S. payments, clearing and settlement systems. For example, Federal Reserve ". . . efforts to reduce systemic risk may be associated with increased levels of daylight overdrafts in Reserve Bank accounts, and efforts to reduce daylight overdrafts may be associated with delays in making final payments."[3]

In particular, the Consultation Paper notes that many banks developed ". . . explicit strategies and techniques to manage their intraday liquidity and daylight

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[1] This commentary was prepared by Carol Clark, David Marshall and Robert Steigerwald, with the assistance of Nicholas Buchholz and Victor Lubasi. Comments by Douglas Evanoff, Craig Furfine, John McPartland, and Richard Porter are gratefully acknowledged.

[2] Board of Governors of the Federal Reserve System, Consultation Paper on Intraday Liquidity Management and Payment System Risk Policy, 71 Fed.Reg. 35,679 (June 21, 2006) (the "Consultation Paper").

[3] Id. at 35,680.

overdrafts" after the Federal Reserve imposed fees for intraday credit.[4] One such strategy is to delay the transmission of large-value payments until late in the settlement day, a phenomenon that appears to be increasing.[5] As discussed in the Consultation Paper, this phenomenon of late in the day bunching of payments may raise significant operational, liquidity and systemic concerns.[6] Therefore, the Board requests "information from financial institutions and other interested parties on their experience in managing intraday liquidity, credit, and operational risks related to Fedwire funds transfers and associated transactions."[7] In addition, the Board of Governors has requested comment on a variety of possible market, operational and policy changes that might address the problem of late-in-the day bunching of Fedwire payments.

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[4] Id.

[5] Id. at 35,681 and Appendix, Chart 3..

[6] The Consultation Paper identifies a number of operational, liquidity and systemic risks associated with this end-of-day bunching of large-value Fedwire funds transfers:

> "[T]he larger the number and value of Fedwire or other payments that are made late in the day, the greater the risk to financial markets that payments will not be settled in a timely manner if significant operational disruptions were to occur late in the day."
>
> "A related long-standing concern of the Federal Reserve has been that depository institutions' intraday liquidity management strategies may lead them to delay sending Fedwire payments until they receive payments in order to manage their use of daylight overdrafts at the Reserve Banks. If this practice became widespread, it could lead to a form of 'gridlock' in the payments system with multiple depository institutions waiting for each other to send payments in order to obtain intraday funds and limit their daylight overdrafts."

Id. at 35,681-82.

[7] Id. at 35,679.

In responding to the Board's requests, we focus on a particular manifestation of the general problem of delayed payments: delays affecting time-sensitive settlement payments associated with exchange-traded derivatives markets. Because the Seventh Federal Reserve District is home to some of the largest clearinghouses for derivatives markets,[8] the Federal Reserve Bank of Chicago has a special interest in potential changes to market practice, operations or Federal Reserve policy that might tend to mitigate the delay of such settlement payments. As we discuss in Part 2 of this comment, these settlement payments represent a very small fraction of overall Fedwire activity. However, their time-sensitivity makes them particularly important for the smooth functioning of and public confidence in the financial system. In Part 2, we present evidence that these payments are often made late and the payments associated with the largest dollar values are those delayed the longest. Based upon this evidence, we believe that the Board's concern about the phenomenon of payment bunching is well-founded. More importantly, we believe that the bunching of systemically important payments, such as financial market settlement payments, could have adverse consequences during periods of financial turmoil.

In Part 3, we discuss the incentives that appear to cause persistent payment delays in Fedwire. In particular, we provide evidence that overnight borrowers in the federal funds market could reduce their costs of borrowing by repaying their

[8] The Clearing House Division of the Chicago Mercantile Exchange ("CME") clears derivatives traded on the CME and Chicago Board of Trade. The Options Clearing Corporation ("OCC") clears all U.S. exchange-traded securities options.

overnight loans early in the settlement day. This, by itself, should provide an incentive for borrowers to repay their federal funds loans early. However, during the period we studied, there is clear evidence of end-of-day bunching of such payments. We conclude that, under current institutional arrangements, the private costs of delayed payments in the form of higher interest charges on overnight loans are insufficient to outweigh the private benefits of these delays.

In Part 4, we discuss a number of possible operational, market or policy changes that may address the problem of persistent payment delays. Based upon this analysis, the Federal Reserve Bank of Chicago endorses changes to the PSR policy that would result in the reduction or elimination of daylight overdraft charges for fully collateralized overdrafts. In addition, we discuss other potential policy measures that, in principle, could help mitigate the problem of end-of-day payments bunching.

2. Delays in Time-Sensitive Financial Markets Payments

Commercial banks and the interbank payment system play a critical role in the processing of settlements for derivatives clearinghouses. The Committee on Payment and Settlement Systems, in its March 1997 report on "Clearing arrangements for exchange-traded derivatives,"[9] provides a clear discussion of the dynamics of these clearinghouse and settlement bank operations.

[9] Committee on Payment and Settlement Systems of the central banks of the Group of Ten countries, "Clearing arrangements for exchange-traded derivatives" (Basel: Bank for International Settlements, March 1997) at 12-16, et seq. (defining the term "settlement bank"); see also,

We focus on the balancing payments among the various settlement banks that are necessary to complete the settlement process associated with margin calls. Many settlements are internally processed at the settlement banks as so-called "on us" debits and credits. After charging the accounts of clearing members and crediting the account of the clearinghouse (for amounts owed by clearing members) and then charging the account of the clearinghouse and crediting the accounts of clearing members (for amounts owed by the clearinghouse), there usually is a surplus or a deficit that remains in the clearinghouse's account at each of the settlement banks. These surpluses and deficits must be eliminated by interbank funds transfers. These balancing payments are the focus of our analysis.

For several years the Federal Reserve Bank of Chicago has received anecdotal reports that these interbank transfers and other settlement-related payments are often made late. To ascertain whether these reports are valid, staff from our Financial Markets Group reviewed confidential data related to derivatives clearing activities during a period when then there were no major financial market disruptions. Analysis of these confidential data confirms that the interbank balancing payments made through Fedwire display patterns of late-in-the-day bunching, even though these balancing payments are considered time-critical. In particular, a substantial percentage of these interbank balancing payments were made late, as determined by the relevant agreements between the clearing

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McPartland, J., "Clearing and settlement demystified," *Chicago Fed Letter* (Chicago: Federal Reserve Bank of Chicago, January 2005).

members and the clearinghouse.[10] A nontrivial percentage was made exceptionally late (3 to 9½ hours). Furthermore, we find that the payments associated with the biggest delays tend to have the largest dollar value.

These delays mirror the late-in-the-day bunching patterns described in the Consultation Paper. While settlement payments for the exchange-traded derivatives markets represent a small fraction of total Fedwire payments, they are properly regarded as time-critical. Public confidence in derivatives markets depends in part, on the timely completion of those payments. If these Fedwire transfers are not made on a timely basis, settlement banks may not give clearing members full or immediate access to funds due from the clearinghouse. If this occurs, absent any information to the contrary, clearing members and other market participants might assume that the clearinghouse has failed to completely collect losses from other clearing members, resulting in a loss of public confidence in the settlement process. Indeed, late settlement payments associated with derivatives markets were one of the root causes of near payments gridlock during the 1987 market break.[11] We believe that these

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[10] These agreements concerning the obligation of clearing members and settlement banks to discharge their payment obligations promptly are discussed in the CPSS's 1997 report on Clearing arrangements for exchange-traded derivatives. Id. at 27-28, et seq.

[11] Kidder Peabody and Goldman Sachs experienced delays in receiving $1.5 billion in settlements after advancing margin funds for customers. See Bernanke, B. (1990), "Clearing and Settlement during the Crash," *The Review of Financial Studies,* v. 3, n. 1. Eichenwald finds that the firms' accounts were not credited for more than three hours. It is well known in the industry that the inability of clearing members to have full access to their settlement funds during the 1987 market break was related to delays in settlement payments between settlement banks. "Indeed, Government and market studies of the crash and interviews with Wall Street professionals show that the flow of money through the nation's markets came perilously close to gridlock on Oct. 20 because of chaos in the clearing system." See Eichenwald, Kurt (1988), "The Day the Nation's Cash Pipeline Almost Ran Dry," *The New York Times,* October 2.

considerations support the Board's concern about pervasive payments delays, and provide additional motivation for policy changes aimed at reducing these delays.

3. Private Costs and Benefits of Payments Delays

As noted in the CPSS report on *New developments in large-value payment systems,*[12] there are three primary funding sources in contemporary real-time gross settlement (or "RTGS") systems:

- Reserve balances;
- Intraday credit facilities provided by the operator of the payment system or private money markets; [13] and
- Incoming payments received from other participants in the payment system.

The first two of these liquidity sources have explicit costs. Users of the payment system incur opportunity costs by holding reserves or precautionary account balances to fund outgoing payments. They also incur opportunity costs by pledging collateral used to secure intraday extensions of credit. Furthermore, in some payment systems, such as Fedwire, there is an explicit charge for intraday

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[12] Committee on Payment and Settlement Systems of the central banks of the Group of Ten countries, *New Developments in large-value payment systems* (Basel: Bank for International Settlements, May 2005) (the "New Developments Report") at 15.

[13] See also D. Evanoff, "Daylight overdrafts: Rationale and risks," *Federal Reserve Bank of Chicago Economic Perspectives* (May 1988) at 21.

credit. To the extent that payment system participants rely upon private credit markets,[14] there are positive costs of borrowing, as we discuss later.

By comparison, incoming payments are essentially costless as a source of liquidity. As pointed out in the CPSS New Developments Report, such payments ". . . simply redistribute the funds among the participants and leave the sum of all funds in the system unchanged. . . :"[15]

> By doing so, the incoming payments received by other participants can be used to fund their outgoing payments, and funding can be recirculated. Thus, the value of payments exchanged is many times in excess of the underlying sources of funding.[16]

For these reasons, incoming payments are generally considered to be among the most important liquidity funding sources.[17]

For an individual institution to make efficient use of this liquidity source requires coordinating outgoing and incoming payments. In the absence of an explicit mechanism to synchronize these payments, such coordination attempts will tend to induce banks to delay payments until the end of the day. This is effective because banks know that any payment to be received during a particular

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[14] Private markets for intraday credit do not appear to exist under current conditions in most market centers; therefore, the operators of RTGS systems generally provide intraday credit facilities of one sort or another to their users.

[15] Supra, n. 11 at 17.

[16] Id. at 38.

[17] See, e.g., Payments Risk Committee, *Managing Payment Liquidity in Global Markets: Risk Issues and Solutions* (New York: March 2003) ("Incoming payments are the most important source of a bank's intraday liquidity. However the use of incoming transfers depends upon the patterns and predictability of payment inflows and outflows.").

settlement day must be received no later than the end of the day.[18] In addition, this strategy minimizes the term of any intraday credit extended to support liquidity because the credit can be repaid promptly with the proceeds from incoming payments.

While these considerations provide clear incentives towards delaying payments, there may be countervailing incentives for banks to make certain payments earlier in the day. In particular, the Consultation Paper considers how a market for early return of federal funds might provide such a countervailing incentive.[19] To evaluate this possibility, we studied the timing of federal funds repayments using data compiled by Craig Furfine.[20] Our data consist of nearly 200,000 observations of overnight federal funds transactions from the first quarter of

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[18] See, e.g., J. McAndrews & S. Rajan, "The Timing and Funding of Fedwire Funds Transfers," *Economic Policy Review*, Vol. 6, No. 2 (July 2000)(". . . the difficulty of achieving . . . a synchronized pattern is considerable because the timing of payments in some respects resembles a coordination game. Banks can benefit by entering payments simultaneously . . . , but they typically do not know when their counterparties might send offsetting payments. Hence, there is the potential for miscoordination.")

[19] As noted in the Consultation Paper:

> "Lenders may find an early return option beneficial during periods in which they anticipate making large or time-critical payments. Terms acceptable to both parties could be negotiated to compensate for the early return. Currently, transactions supporting the early return of funds appear to be relatively rare. A more active market could effectively amount to an implicit market for intraday funds."

Supra, n. 2 at 35, 683.

[20] Furfine identifies the transactions associated with overnight federal funds loans from the records of all Fedwire payments during this time period. See Furfine, C., "Banks as Monitors of Other Banks: Evidence from the Overnight Federal Funds Market," *Journal of Business* 74:33:55 (2001).

1998.[21] Our two key findings are, first, that repayments of overnight federal funds loans are bunched near the end of the day, and second, higher interest rates are charged for holding on to loans later in the day.

Chart 1 shows the bunching phenomenon. In particular, the value of overnight loan repayment steadily increases throughout the day, peaking between 4:00 and 5:00 PM ET before sharply dropping off. (A similar pattern emerges when examining the volume of repayments, rather than the value.) This finding mirrors the end-of-day payments bunching discussed in the Consultation Paper.

However, delayed repayment is not without cost. Chart 2 shows that, on average, the interest rate charged on an overnight loan increases with loan duration. Each bar in this chart reflects the duration[22] interval containing ten percent of daily repayment value. Thus, ten percent of the value in the sample involve loans less than or equal to 13.1 hours in duration. The average (annualized) interest rate[23] associated with those loans is 4.9 basis points below the target federal funds rate (which was 5.5% per annum at that time). Ten percent involve loans between

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[21] Due to unresolved issues of data access, our analysis is limited to data from 1998. It is therefore noteworthy that a study of recent Euro-area money market data finds similar results to those we present herein. See Baglioni, A., and A. Monticini, "The Intraday Price of Money: Evidence from the e-MID Market," working paper no. 63, Quaderni dell' Istituto di Economia e Finanza, Universita' Cattolica del Sacro Cuore, Milano (2005).

[22] Duration is the time elapsed between outgoing and return payments, not counting time when Fedwire is closed.

[23] As described in Furfine, the interest rate is inferred from the difference between the amount of the outgoing payment on the initial date and the amount of the return payment on the subsequent date. Thus, the computed interest rate includes any fixed charges, negotiated costs, or penalties for late payment. The interest rate is then annualized using the duration of the loan. See Furfine, supra note 20.

13.1 and 14.8 hours, with an average rate of 2.1 basis points below the target rate, and so on. Chart 2 shows that a higher rate of interest is incurred for loans with longer duration. Specifically, regression analysis implies a duration premium of 1.3 percent (annualized) for each additional hour of loan duration, as well as an additional premium of 5.7 percent (annualized) for repayment received after 5:00 PM ET.

These premia imply that an overnight borrower can cut its funding costs through early repayment. In that sense, a market for early repayment clearly exists in the period covered by our data. However, as shown in Chart 1, the vast preponderance of repayments are still made late in the day. It appears that borrowers avoid early repayment because the indirect liquidity costs incurred by early repayment outweigh the reduced rates of interest documented in this section. This evidence leads us to be skeptical that a market for early repayment of overnight loans, in and of itself, provides a significant incentive for banks to avoid payment delays.

4. Suggested Changes to PSR Policy

To address concerns about end-of-day bunching of Fedwire payments, the Consultation Paper identifies several potential changes to payments system operations, market structure and/or public policy. The Federal Reserve Bank of Chicago considered these changes according to the following criteria:

- Likely impact on end-of-day payments bunching

- Direct implementation costs to the Federal Reserve System
- Likely transition and disruption costs to the private sector
- Effects on the financial system beyond impact on payments timing.

Based on these criteria, the Federal Reserve Bank of Chicago endorses changes to the PSR policy that reduce or eliminate daylight overdraft charges for fully collateralized overdrafts. In addition, we discuss the certain other operational, market and policy changes, which are deserving of further analysis.

4.1. Reduced charges for collateralized daylight credit

The Federal Reserve Bank of Chicago recommends adoption of a pricing structure for daylight overdrafts which would either eliminate or substantially reduce fees for overdrafts that are fully collateralized. Before 2001, the PSR policy embraced the use of collateral strictly for purposes of securing overnight discount window lending, as opposed to intraday credit. Once the collateral is pledged, however, it supports any credit extended to the bank, whether overnight or intraday. Either way, a security interest in this collateral is created in favor of the Reserve Bank.[24] As noted by President Jeffrey Lacker of the Federal Reserve Bank of Richmond, "[Reserve Banks have] a lien on any bank collateral that happens to be pledged for use in overnight borrowing, so perhaps it is best

[24] As noted in the Board's 2001 request for public comment on the future longer-term direction of the PSR policy: ". . . the majority of Federal Reserve daylight credit extensions are . . . implicitly collateralized because depository institutions that have pledged collateral must sign Operating Circular 10, which provides the Reserve Banks with a secured interest in any collateral recorded on the Reserve Bank's books." Policy Statement on Payments System Risk, Docket No. R-1111, 66 Fed.Reg. 30,208, 30,211 (June 5, 2001).

to describe Fed daylight credit as partially secured."[25] From the context of President Lacker's comments, it is clear that daylight credit is only "partially secured" if the amount of this credit exceeds the amount of collateral pledged. Daylight credit up to the amount of collateral in place is indeed fully secured.

Changes to the PSR policy in 2001 permit banks to use collateral to obtain daylight overdrafts in excess of their net debit,[26] but the cost to banks of such collateralized overdrafts has not been reduced. The Federal Reserve Bank of Chicago favors modifying this policy so that fully collateralized daylight overdrafts are subject to fees that are substantially reduced or fully waved. The Federal Reserve Bank of Chicago supported this proposal in its November 2001 comment letter. As discussed in that comment,

> The Bank's policy position on pricing is predicated upon the premise . . . that daylight overdraft facilities serve the public interest. To the extent that daylight overdrafts are fully collateralized, there is little or no justification for the price to include a risk premium.[27]

To be clear, this proposal does not mandate full collateralization of all intraday credit.

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[25] Lacker, J., "Central Bank Credit in the Theory of Money and Payments," Remarks, Economics of Payments Conference II, Federal Reserve Banks of Atlanta and New York (New York, March 29, 2006); see also, Lacker, J., "Payment System Disruptions and the Federal Reserve Following September 11, 2001," Carnegie-Rochester Conference Series on Public Policy (Nov. 21, 2003).

[26] Policy Statement on Payments System Risk, Docket No. R-1107, 66 Fed.Reg. 30,199, (June 5, 2001).

[27] See Moskow, Federal Reserve Bank of Chicago Response to Board of Governors Policy Statement on Payments System Risk—Potential Longer-Term Policy Direction (Docket No. R-1111, November 16, 2001).

By reducing the cost of collateralized intraday borrowings, this proposal would reduce the current incentives to engage in tactical behavior to avoiding daylight overdraft charges by delaying most large value Fedwire payments until very late in the day. Furthermore, the Federal Reserve Bank of Chicago believes that this policy change would have little impact on current bank behavior concerning collateralization, at least for the largest banks. Such banks typically have large amounts of collateral pledged to the Federal Reserve. Coleman (2002)[28] reports that for banks that had collateral pledged, 94% of their average daylight overdrafts and 70% of their peak overdrafts were collateralized. The Federal Reserve Bank of Chicago obtained similar results when we analyze 2006 data on the eleven largest Seventh District banks. Specifically, nine of those eleven banks had collateral pledged to the Federal Reserve at some time during that year. For these nine, an average of 92% of peak daylight overdrafts were fully collateralized. Moreover, as noted in the Consultation Paper, "the level of collateral pledged to reserve banks [since 2002] for discount window and PSR purposes has increased steadily."[29]

The Federal Reserve Bank of Chicago believes that the elimination or reduction of daylight overdraft charges for overdrafts that are fully collateralized would have extremely low implementation costs and would impose essentially no adaptation costs on the private sector. Furthermore, there would be little ancillary impact on

[28] Coleman, S., "The Evolution of the Federal Reserve's Intraday Credit Policies." *Federal Reserve Bulletin* 88 (February 2002) at 83.

[29] Supra n. 2 at 35,683.

the financial system beyond the timing of payment instructions. For these reasons, this proposal would be relatively easy to institute. However, the overall impact on payments timing is unknown, and may be modest, taken in isolation. Thus, additional modifications to the PSR policy may be needed to offset fully the current financial incentives that seem to encourage end-of-day payments bunching.

4.2. Discussion of other alternatives

Additional possible changes in payments operation and policy include the following:

- Time of day pricing of overdrafts and/or payment transactions;
- Payment throughput requirements;
- Development of a liquidity savings mechanism for the Fedwire funds transfer system;
- Multiple settlement cycles in private sector settlement systems; and
- Payment of interest on reserve balances.

Of these, time-dependent pricing of intraday credit and/or payments transactions strikes us as the most promising. Both the Consultation Paper and this comment provide evidence that banks are extremely price sensitive in deciding on the timing of their payments. Thus, we believe that time-dependent pricing represents a promising direction for mitigating end-of-day payments bunching. Possible ways to implement time-dependent pricing include reduced fees earlier

in the day; penalty rates after a certain point (e.g., 1600h ET); and waiving overdraft fees at certain times in the day in order to encourage payments synchronization. Time-of-day transaction pricing is currently implemented in the Swiss Interbank Clearing ("SIC") funds transfer system.

The other alternatives have less clear cost-benefit tradeoffs. A throughput rule accomplishes the same objective as a well-designed time-of-day pricing structure, but with less flexibility. Liquidity savings mechanisms, such as those incorporated into RTGS+, TARGET2, and the proposed BOJ-NET, would likely have high implementation costs but potentially high benefit to the financial system. These proposals merit further study.

Multiple settlement cycles in private settlement systems such as DTCC and CHIPS could reduce end-of-day payment concentration. However, we are concerned about the high costs of private sector adjustment and the possibility of adverse unintended consequences. For example, moving DTCC settlements to an earlier time of day may force broker/dealer treasury operations to make overnight funding decisions with far less information than they have under the current practice of waiting until later in the day.

Finally, paying interest on reserve balances would, all things being equal, increase average daily reserve balances and thus reduce the use of daylight overdraft credit. If the costs of daylight overdrafts are the main factor driving

payments towards the end of the day, increasing overall reserve balances by paying interest on reserves would tend to reduce end-of-day payment bunching. Of course, there are other financial market distortions that would be mitigated by reducing the wedge between the rate of return on central bank funds and returns of other short-term investment alternatives. The proposal to pay interest on reserves also has implications for liquidity management, monetary policy, and implementation that go well beyond the focus of this comment letter.

Chart 1: Total Value of Overnight Loan Repayments by Time of Day

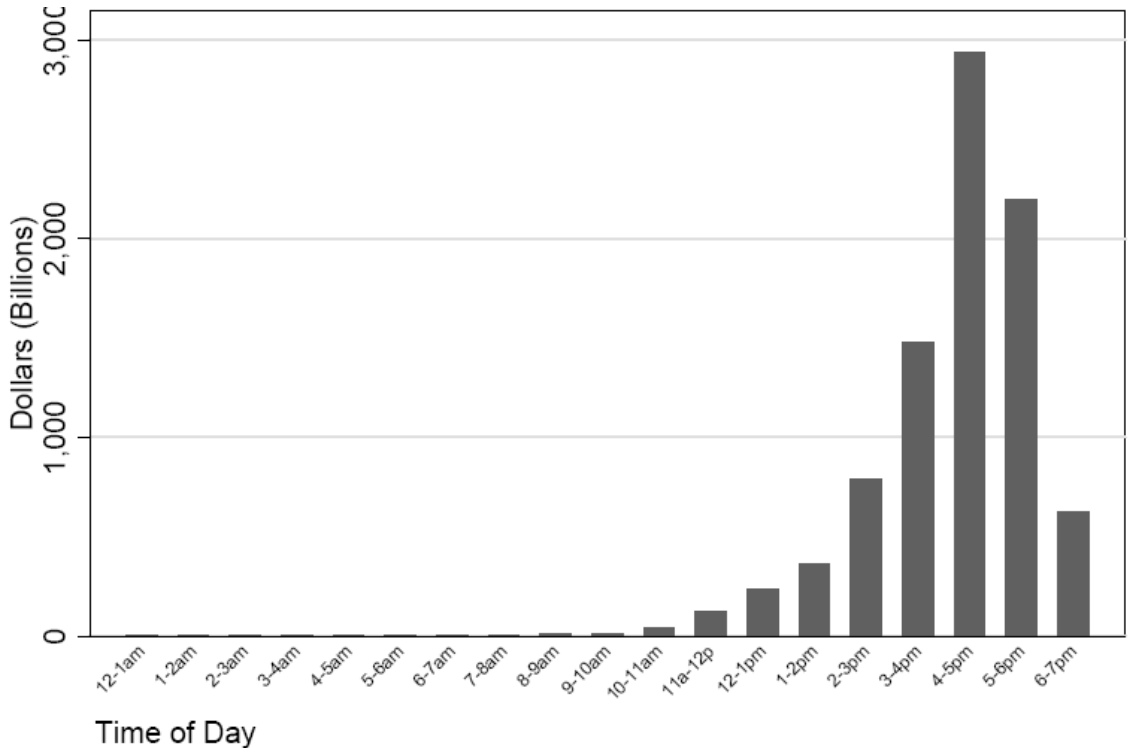

Chart 2: Average Interest Rates by Duration of Loan