


## BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

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**Date:** October 20, 2003  
**To:** Board of Governors  
**From:** Mark W. Olson   
**Subject:** Imputed Investment Income on Clearing Balances

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The Committee on Federal Reserve Bank Affairs has reviewed staff's recommendation that the Board modify the method for imputing priced-service income from clearing balance investments. I am forwarding the attached staff memorandum and draft *Federal Register* notice to the Board for its consideration at its October 22 meeting.

Attachments





BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

DIVISION OF RESERVE BANK OPERATIONS AND PAYMENT SYSTEMS

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**Date:** October 20, 2003

**To:** Board of Governors

**From:**  Brenda Richards,  Lezell Murphy,  Gregory L. Evans, and  Dorothy LaChapelle

**Subject:** Imputed Investment Income on Clearing Balances

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**ACTION REQUESTED**

Staff requests that the Board adopt changes in the method for imputing investment income on clearing balances to better reflect the broader range of investments available to banks and the risk-management framework used by banks and their regulators. The Reserve Banks' Financial Services Policy Committee (FSPC) has endorsed the proposed changes.

**BACKGROUND**

In May 2003, the Board requested comment on a proposal to modify the method for imputing priced-service income from clearing balance investments. The proposal was based on the significant differences in the current assumed investment of priced-services clearing balances and the investments available to banks and bank holding companies (BHCs) and growing concern regarding the negative spread between the rate used to impute earnings on investments and the cost of funds. The Board received two responses, both from Reserve Banks, to its request for comment. The Board received no comments from the banking industry.

The attached draft *Federal Register* notice describes changes to the method used to impute priced service clearing balance income to expand the investments o those available to banks and BHCs. The investment mix would be determined using a risk-management framework that includes criteria consistent with those used by banks, BHCs, and regulators to evaluate investment risk. The imputed portfolio developed would be used to determine the spread between the investment return and three-month Treasury bill rate. A ten-year average of

these spreads would be used to impute an investment return expressed as a constant annual spread. If adopted by the Board, the changes would be effective January 2004.

## **DISCUSSION**

Clearing balances held by depository institutions at Reserve Banks are similar to compensating balances held by respondent banks at correspondent banks. The Reserve Banks currently pay earnings credits based on the federal funds rate.

Reserve Banks currently impute income on clearing balances on the assumption that all available clearing balances are invested in three-month Treasury bills. The spread between the three-month Treasury bill rate and the federal funds rate has averaged negative 18 basis points over the past twenty years with a standard deviation over the same period of 23 basis points. As a result of this average negative spread, the net income on clearing balances during these years was largely the result of imputed earnings on excess balances, on which Reserve Banks do not pay earnings credits. A modification to the current imputed investments could have significantly increased earnings and decreased the volatility of the imputed return. For example, a simple portfolio of federal funds would have eliminated the interest rate spread.<sup>1</sup> This suggests that the current method may have imputed an unnecessarily low NICB to priced services during these years.

Correspondent banks and BHCs invest in a much wider array of instruments than three-month Treasury bills. Because BHCs are used as a proxy for Reserve Banks' imputed costs and profit, the Board proposed that Reserve Banks impute priced services income from investments comparable to those available to BHCs. Both commenters supported expanding the investments available on which to impute income.

To limit imputed investments to prudent levels, the proposal included a risk-management framework. The Reserve Banks currently use three risk measures in the private sector adjustment factor calculation, implemented for 2002, which address liquidity, interest rate,

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<sup>1</sup> Also before the Board for its consideration is a recommendation to change the rate used to calculate the cost of earnings credits. The proposal, if adopted, would change the earnings credit rate to a discounted three-month Treasury bill rate. Specifically, earnings credits would be based on 90 percent of a rolling 13-week average of the annualized coupon equivalent yield of three-month Treasury bills in the secondary market.

and credit risk and these would be applied to NICB investment decisions.<sup>2</sup> The Board proposed adding a measure to address the longer-term effects of interest rate risk and adopting a specific limit on one of the measures to address credit risk.

To manage the effects of long-term mismatches between assets and liabilities on the value of an entity, the Board proposed using the economic value of equity (EVE) measure used by BHCs and regulators. EVE compares the present value of interest-bearing assets and liabilities in the current rate environment with the present value if the rates changed by 200 basis points. The comparison, which is used as a complement to the interest rate risk measurement currently used, shows the change in present values as a proportion of equity. The Board proposed a risk tolerance of a change of 8 percent in equity resulting from a 200-basis-point-rate change. To manage credit risk, the Board proposed limiting risk-based capital to maintain the ratio of tier-one capital to risk-adjusted assets at a level equal to or greater than that maintained by the fifty largest BHCs or the level required by the FDIC for a well-capitalized institution. Staff recommends that the Board adopt the FDIC-required level, which is currently 10 percent. Both commenters believed that the proposed risk management framework is appropriate and supported the constraints.

The Board also requested comment on two implementation methods that incorporate the risk-management framework. Based on historical performance, both methods emerge from yield-optimized portfolios of BHC-allowable investments selected within the proposed risk-management framework. The first method proposed constructing a specific portfolio of hypothetical investments, tracking its yield, and ascribing the income to priced-services activities (the actual return method). The second method proposed using average hypothetical portfolio returns, expressed as a constant spread over the three-month Treasury bill rate, as the basis for future investment performance and ascribing the income to priced services activities (the constant annual spread method).

Although no comments were received from the banking industry in response to the Board's proposal, industry representatives provided input to the staff early in the process of developing the proposal. In those discussions, they suggested that a constant basis point calculation, as a spread over the rate used to determine the cost of clearing balances, would be

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<sup>2</sup> Liquidity risk is managed by limiting long-term investments to a conservatively established core amount of clearing balances. Interest rate risk is managed to limit the effect of significant changes in clearing balance cost and earnings rates on total cost recovery.

appropriate for imputing income on hypothetical investments. Both Reserve Bank commenters, however, preferred the actual return method for implementation of the changes to the NICB imputed investment methodology to the constant annual spread method. The commenters stated that the actual return method would be a practice more representative of the BHC peer group and would be more “transparent” than the constant annual spread method.

The FSPC believes that the constant annual spread method is preferable as it imputes a reasonable return where it is difficult to reflect actual BHC practice and this method reduces some of the administrative burden during the pricing year.

The constant annual spread method, however, eliminates the yield fluctuations that a BHC would experience with an actual portfolio comparable to that underlying the constant spread method. Selecting an average yield over the ten-year period that maximizes the return based on accepting a higher volatility (standard deviation) to determine the constant spread results in a constant, level return without accepting the commensurate interest rate risk inherent in the actual return method.

That said, we recommend that the Board adopt the constant annual spread method, which imputes an investment yield expressed as a spread over the three-month Treasury bill rate. We believe that with any method of imputing investment income, the Reserve Banks face difficulties in simulating the investment practices of banks and BHCs. On balance, the constant return method does provide a reasonable proxy for a return comparable to what a bank or BHC would experience with similar investments with less administrative complexity compared to the actual return method.

Attachment

**FEDERAL RESERVE SYSTEM**

**[Docket No. R-1152]**

**Federal Reserve Bank Services**

**Imputed Investment Income on Clearing Balances**

**AGENCY:** Board of Governors of the Federal Reserve System.

**ACTION:** Notice.

**SUMMARY:** The Board has approved modifications to the method for imputing priced-service income from clearing balance investments. The Federal Reserve Banks impute this income when setting fees and measuring actual cost recovery each year. The Reserve Banks will impute the income from clearing balance investments on the basis of a broader portfolio of investments than used previously, selected from those available to banks. The Reserve Banks will impute an investment return expressed as a constant annual spread over the rate used to determine the cost of clearing balances. The constant annual spread will be determined based on an underlying imputed investment portfolio. Selection of the portfolio investment mix will be subject to a risk-management framework that includes criteria consistent with those used by banks, bank holding companies, and regulators in evaluating investment risk. The revised method will be used to impute investment income on clearing balances beginning in January 2004.

**FOR FUTURE INFORMATION CONTACT:** Gregory L. Evans, Manager (202/452-3945) or Brenda L. Richards, Sr. Financial Analyst (202/452-2753); Division of Reserve Bank Operations and Payment Systems. Telecommunications Device for the Deaf (TDD) users may contact 202/263-4869.

**SUPPLEMENTARY INFORMATION:**

**I. Background**

The Monetary Control Act (MCA) requires Federal Reserve Banks to establish fees for “priced services” provided to depository institutions at a level necessary to recover, over the long run, all direct and indirect costs actually incurred and imputed

costs.<sup>1 2</sup> In addition, the Reserve Banks impute a priced services return on capital (profit).<sup>3</sup> The imputed costs and imputed profit are collectively referred to as the private-sector adjustment factor (PSAF). Just as the PSAF is used to impute costs that would have been incurred and profits that would have been earned had the services been provided by a private business firm rather than the central bank, the Reserve Banks impute income that would have been earned on the investment of clearing balances that customers hold with the Reserve Banks as if those balances had been held with a correspondent bank. This imputed income, less the costs associated with the clearing balances, is referred to as the net income on clearing balances (NICB).

Calculating the PSAF includes projecting the level of priced-services assets, determining the financing mix used to finance the assets, and the rates used to impute financing costs.<sup>4</sup> Much of the data for the PSAF are developed from the “bank holding company (BHC) model,” a model that contains consolidated financial data for the nation’s fifty largest (based on deposit balances) BHCs. As part of this process, a core amount of clearing balances is considered stable and available to finance long-term assets.

The method for deriving the NICB is reviewed periodically to ensure that it is still appropriate in light of changes that may have occurred in Reserve Bank priced services activities, accounting standards, finance theory, regulatory practices, and banking activity.<sup>5</sup> The current method for imputing investment income assumes that the

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<sup>1</sup> Priced services include primarily check, automated clearinghouse, Fedwire funds transfer, and Fedwire securities services.

<sup>2</sup> Imputed costs include financing costs, taxes, and certain other expenses.

<sup>3</sup> The return on capital is imputed using the average of the results of three economic models: the comparable accounting earnings model, the discounted cash-flow model, and the capital asset pricing model.

<sup>4</sup> Equity is imputed based on the Federal Deposit Insurance Corporation’s (FDIC) definition of a “well-capitalized” institution for insurance premium purposes.

<sup>5</sup> In 1994, the Board requested comment on a proposal to modify the method for imputing clearing balance income. The Board proposed replacing the three-month Treasury bill imputed investment with a longer-term Treasury investment based on the earning asset maturity structure of the largest BHCs. As a result of issues related to interest rate risk raised in the comments, the Board did not adopt the proposal. The proposal would have created an asset and liability mismatch that created interest rate risk exposure inappropriate for Federal Reserve priced services. In addition, Federal Reserve priced services would not have assumed the interest rate risk associated with longer-maturity investments because the imputed return would have been adjusted monthly to reflect current rates. (59 FR 42832, August 19, 1994)

Reserve Banks invest all clearing balances, net of imputed reserve requirements and the amount used to fund priced-services assets, in three-month Treasury bills. The imputed income on the Treasury bill investments net of the actual earnings credits granted to clearing balance holders based on the federal funds rate is considered income for priced-services activities. The net income associated with clearing balances is one component in pricing decisions and in evaluating cost recovery.

#### *A. Clearing Balances*

Depository institutions may hold both reserve and clearing balances with the Federal Reserve Banks.<sup>6 7</sup> Reserve balances are held pursuant to a regulatory requirement and are not a result of an institution's use of priced services.<sup>8</sup> Clearing balances are held to settle transactions arising from use of Federal Reserve priced services for institutions that either do not hold reserve balances or find their reserve balances inadequate to settle their transactions.<sup>9</sup> At year-end 2002, depository institutions held more than \$10 billion in clearing balances at Reserve Banks.

Clearing balances held at Reserve Banks are similar to compensating balances held by respondent banks at correspondent banks. Respondent banks hold compensating balances to support the settlement of payments, and to pay fees assessed by the correspondent bank. Reserve Banks and some correspondent banks establish a contracted balance level that the account holder must maintain on average over a specified period. Both Reserve Banks and correspondent banks provide compensation in the form of earnings credits to the holders of clearing or compensating balances. Historically, earnings credits provided by the Reserve Banks have been based on the federal funds rate. In May 2003, the Board requested comment on whether it should consider modifications to the Reserve Banks' earnings credit rate in the future, and, if so,

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<sup>6</sup> Clearing balances were introduced when Reserve Banks implemented the MCA.

<sup>7</sup> Clearing balances, unless otherwise indicated, refer to total clearing balances, including contracted balances and balances in excess of the contracted amount, held by depository institutions with the Federal Reserve Banks.

<sup>8</sup> Regulation D, 12 CFR Part 204

<sup>9</sup> Many depository institutions also set their contracted clearing balance level to generate earnings credits needed to pay fees assessed for Reserve Bank priced services.



what factors should be considered in the evaluation.<sup>10</sup> One commenter stated that the Federal Reserve should evaluate the appropriateness of its earnings credit rate as part of its overall pricing of services, including a review of private sector practice. The Board recently changed the earnings credit rate to be based on a discounted three-month Treasury bill rate, which is now more consistent with market practice.<sup>11</sup>

### ***B. Imputed Investment of Clearing Balances***

The Reserve Banks impute income on the clearing balance investments rather than using the actual results from monetary policy investment activities.<sup>12</sup> The imputation of clearing balance income is analogous to assuming that the priced-services enterprise, which is essentially a “monoline” bank offering only payment services, also includes a treasury function. Income is currently imputed based on the assumption that all available clearing balances are invested in three-month Treasury bills.<sup>13 14</sup>

Historically, most of the net income on clearing balances was the result of imputed earnings on excess balances held, which have no associated cost. The practice of imputing clearing balance investments in three-month Treasury bills while paying earnings credits at the federal funds rate resulted in an average interest rate spread of negative 18 basis points over the past twenty years with a standard deviation over the same period of 23 basis points and ranged from 23 to -58 basis points.<sup>15</sup>

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<sup>10</sup> 68 FR 32513, May 30, 2003

<sup>11</sup> More specifically, the earnings credit rate will be 90 percent of a rolling 13-week average of the annualized coupon equivalent yield of three-month Treasury bills in the secondary market. See companion notice, Federal Reserve Bank Services, elsewhere in today’s *Federal Register*.

<sup>12</sup> Decisions about monetary policy investment transactions are not motivated by profit objectives; therefore, the actual investment results are not applicable to priced-service activities.

<sup>13</sup> Clearing balances needed to meet an imputed reserve requirement (10 percent of clearing balances) and to fund assets used in the production of priced services (\$407 million in 2004) are not available for investment.

<sup>14</sup> The Board chose three-month Treasury bills as the imputed investment vehicle in 1982 because, at that time, the yield was considered to approximate the return that would be realized had clearing balance funds been held and invested by a correspondent bank. In addition to providing a short-term earnings rate consistent with creating a matched asset and liability structure with the short-term liabilities, the three-month Treasury bill yield data are easily verified by outside observers with publicly available data.

<sup>15</sup> The standard deviation measures the variance around the average and indicates the level of volatility of the rates. Two-thirds of the time the actual yield will fall in the range of the average plus or minus one standard deviation. Ninety-five percent of the time the actual yield is expected to fall in the range of the average plus or minus two standard deviations.

Given that a simple change to federal funds investments would have simultaneously eliminated the interest rate spread and reduced the volatility, as expressed by the standard deviation, to zero, the Board believed that the Reserve Banks' imputed investment income method may have imputed an inappropriately low NICB to priced services.<sup>16</sup> Correspondent banks and BHCs invest in a much wider array of investments than those imputed by the Federal Reserve, including loans, Treasury securities with longer maturities, government agency securities, government-sponsored enterprise securities, federal funds, commercial bonds, commercial paper, money market mutual funds, asset-backed securities, foreign currencies, repurchase agreements, and derivatives. As a result, the Board requested comment on a proposal to expand imputed investment options within a risk management framework similar to that used by banks, BHCs, and regulators in evaluating investment risk. To implement the proposal, the Board requested comment on two methods.

## **II. Summary and Analysis of Comments**

The Board received two responses, both from Reserve Banks, to its request for comment. Although the Federal Reserve worked with private-sector representatives in developing the methods on which the Board requested comment, the Board received no comments from the banking industry. Both commenters favor changing the method used for imputing investment income and believe that a new method more consistent with the practices of BHCs will provide a better basis on which to impute income used in setting Federal Reserve fees.

### ***A. Investments***

Because the BHCs are a proxy for providers of priced-services activities, options for Reserve Bank clearing balance investments should be comparable to those available to BHCs. In principle, all of the investments available to BHCs could be appropriate clearing balance investments. In its request for comment, the Board proposed limiting imputed investments to federal funds; investments suitable for a buy-and-hold strategy, such as Treasury securities, government agency securities, commercial

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<sup>16</sup> While reducing interest rate risk, a change in investment from Treasury bills to federal funds would, in theory, increase credit risk. As a practical matter, however, banks have not incurred losses due to default in federal funds transactions.

paper, and municipal and corporate bonds; and money market and mutual funds.<sup>17</sup> For investments with a fixed term, this strategy eliminates capital gains and losses from the investment returns and simplifies the recognition and reporting of imputed investment income. Realized and unrealized gains and losses on imputed mutual fund investments would be incorporated in the total return and recorded as net earnings. The Board requested comment on whether this investment strategy was appropriate.

Both commenters considered it reasonable to expand the imputed investment options. To limit discretion allowed in “managing” the portfolio and on the array of allowable investments, one commenter suggested that the investments be selected from a relatively narrow set of assets with readily observable market values. The second commenter suggested choosing investments with average or lower than average risk characteristics and recommended that the set of fixed-income investments be limited to those that are investment grade.

The Board has concluded that in constructing an imputed portfolio, investments will be selected from those allowable to banks and BHCs and will employ a buy-and-hold strategy for those investments with a stated maturity. Mutual fund gains and losses will be incorporated in the total return and recorded as net earnings. When investing in fixed-income instruments, only those of investment grade will be imputed.

### ***B. Risk-Management Framework***

The Board considered the comparability of the imputed investments with investments of a similar private-sector entity, and requested comment on establishing a risk-management framework to limit the imputed investments to prudent levels in accordance with sound business practice and regulatory constraints. To address these risks, the exposure to any one type of risk would be limited and measured in terms of earnings or equity at risk. The Reserve Banks currently use three risk measures in calculating the PSAF that address liquidity, interest rate, and credit risk. In its request for comment, the Board proposed incorporating these measures, while adopting a specific constraint on credit risk, and adding a measure to address the longer-term effects of

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<sup>17</sup> Mutual fund investments would be selected from those that are publicly available and widely held. The specific funds used for imputing income would be disclosed during the price-setting process so that performance could be tracked and replicated. See companion notice, Federal Reserve Bank Services, elsewhere in today’s *Federal Register*.

interest rate risk. In addition, the Board requested comment on any other risk-management criteria that should be considered.

1. *Liquidity Risk*

Although clearing balances are short term in nature, the Board previously determined that a portion of clearing balances remained stable and initially established \$4 billion as available to fund long-term assets used in the delivery of priced services, rather than invested only in short-term assets.<sup>18</sup> Neither commenter objected to making the portion of core clearing balances not used to fund priced services assets available for investment in longer-term instruments. The Board believes that limiting the use of clearing balances to fund longer-term assets to only that portion that is deemed core clearing balances effectively manages liquidity risk.

2. *Interest Rate Risk*

In considering interest rate risk, one must evaluate the effect on earnings should the rate used to determine the cost of funds and the investment yield on those funds change at different intervals. To evaluate the risk of funding longer-term assets with short-term liabilities at rates that do not change concurrently and the resulting earnings volatility, the Board adopted the interest rate sensitivity analysis measure as part of its PSAF method. As adopted, this measure requires that longer-term investment of clearing balances be managed so that a 200-basis-point change in the rates for both the yield on all relevant priced services assets and the cost of all relevant priced service liabilities would not affect earnings, measured by the overall priced services recovery rate, by more than 200 basis points.

In requesting comment, the Board proposed adopting a second measure of interest rate risk, known as economic value of equity (EVE), for use in conjunction with the earnings at risk measure. The EVE measure, which is used by BHCs and regulators, compares the present value of interest-bearing assets and liabilities in the current rate environment resulting from a change in interest rates. The comparison shows the change

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<sup>18</sup> 66 FR 52617, October 16, 2001

in present values as a proportion of equity.<sup>19</sup> The Board requested comment on whether a risk tolerance of a change of 8 percent of equity resulting from a 200-basis-point-rate change is appropriate.<sup>20</sup> One commenter agreed that the introduction of EVE is appropriate given the current supervisory guidelines for the BHC peer group and stated that the proposed constraint is appropriate.

The Board received no comment on whether these two measures of interest rate risk, earnings at risk and equity at risk, are together sufficient measures for monitoring and controlling interest rate risk. The Board will adopt the EVE measure and set the risk tolerance at a change of 8 percent of equity resulting from a 200-basis-point-rate change. In addition, the earnings at risk tolerance will be maintained as a prudent constraint on the imputed investments.

### 3. *Credit Risk*

The overall level of credit risk compared with the level of equity is measured by the ratio of risk-adjusted assets to capital.<sup>21</sup> The Federal Deposit Insurance Corporation (FDIC) uses two risk-based capital measures as criteria in defining a “well-capitalized” institution for insurance premium purposes. One requires a risk-based capital ratio of 10 percent or more for total capital and the other requires a risk-based ratio of 6 percent or more for tier one capital.<sup>22</sup> Only tangible equity capital (tier one capital) is imputed to Reserve Bank priced services; therefore, the two measures are the same. The current investment in three-month Treasury bills carries a risk weight of zero. As a result, the balance sheet underlying the 2003 PSAF showed that the priced services risk-based capital ratio is nearly 33 percent for both measures.<sup>23</sup> A change in investment

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<sup>19</sup> EVE is used as a complement to the interest rate sensitivity analysis already adopted to evaluate the effects of long-term mismatches between assets and liabilities on the value of an entity; the interest rate sensitivity analysis captures the risk to near-term earnings.

<sup>20</sup> Large BHCs typically manage the EVE measure within a risk-tolerance range of 5 to 10 percent. More information on measurement of interest rate risk can be found at <http://www.federalreserve.gov/boarddocs/supmanual/trading/trading.pdf>.

<sup>21</sup> Credit risk results from the possibility that the issuer of a bond or other borrower cannot repay its obligations as promised. Criteria for managing credit risk are necessary when investing in instruments other than Treasury securities.

<sup>22</sup> <http://www.fdic.gov>

<sup>23</sup> 66 FR 67834, November 7, 2002

strategy that includes investments with greater risk requires establishing a minimum risk-based total capital ratio within which to make investment decisions. To manage credit risk, the Board requested comment on whether either of two options for establishing a minimum risk-adjusted total capital ratio adequately limits imputed investment risk. The first option would maintain the ratio of total capital to risk-adjusted assets at a level equal to or greater than that maintained by the fifty largest BHCs, which has remained near 12 percent between 1997 and 2002. Under the second option, the risk-based capital ratio would be maintained equal to or greater than the minimum required by the FDIC for a well-capitalized institution, which is currently 10 percent.

One commenter noted that the current priced services risk-based capital ratio is not representative of that of its peers and supported a change to a ratio within the range of 10 to 12 percent and provided empirical data suggesting that the FDIC minimum is within the range of risk-based capital ratios for the top 50 BHCs. The Board has concluded that imputed investments will be limited to those that result in priced-services activities maintaining a risk-based capital ratio equal to or greater than the minimum required by the FDIC for a well-capitalized institution, which is currently 10 percent.

In responding to whether other risk management criteria should be considered, one commenter suggested that, because of rapidly changing risk management practices, the Board regularly review BHC peer group risk management practices. Because the priced services risk-based capital ratio will be based on FDIC requirements, it will be reviewed each year to determine the ratio necessary to meet the regulatory capital requirements. The Board has concluded that all four risk constraints will be included in the framework used to select investments on which to impute priced-services income.

### ***C. Implementation Methods***

The Board requested comment on two alternative methods to impute clearing balance investment income based on the proposed conceptual framework. Both methods emerge from an underlying imputed portfolio of investments. The first method proposed constructing a specific portfolio of hypothetical investments, tracking its yield, and ascribing the income to priced-services activities (the actual return method). The

second method proposed using average hypothetical portfolio returns, expressed as a constant spread over the three-month Treasury bill rate, as the basis for future investment performance and ascribing the income to priced services activities (the constant annual spread method).

1. *Constructing a Portfolio*

To construct a hypothetical portfolio, the Reserve Banks would select from the investment options described earlier that are available to banks and BHCs, based on an allocation method that uses historical data to create an optimized portfolio.

Historical data are used to create the optimized portfolio to avoid any perception that the Federal Reserve is signaling future monetary policy actions or is otherwise projecting future economic conditions or interest rate environments. This optimized portfolio is the basis for the investment allocation within the risk-management framework that maximizes the spread of the rate of return on the portfolio over the Treasury bill rate.<sup>24</sup>

To avoid the administrative complexities of incorporating realized capital gains and losses in the imputed investment results for fixed-term investments, such as corporate bonds, the Board proposed to impute these investments as held to maturity.<sup>25</sup>

To impute the pricing-year's investment income, the Board proposed using this portfolio method to create a pricing-year imputed portfolio of investments for the actual return method or to create a ten-year average portfolio performance for the constant annual spread method.

To create a pricing-year imputed portfolio of investments to implement the actual return method, the Board proposed assuming that the pricing-year portfolio is the most current optimized portfolio for the most current ten-year period. For example, the 2004 pricing-year's imputed portfolio yield would be the yield obtainable in 2004 from the optimum portfolio allocated based on the optimized portfolio's investment return performance from 1994 through 2003.

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<sup>24</sup> A ten-year period was selected because the data are available and the period includes a variety of interest rate environments.

<sup>25</sup> This results in a ladder approach to determining the average yield. For an investment in five-year corporate bonds, for example, the average yield would incorporate the yield from bonds purchased in increments over the preceding five years.

To create ten years of optimized portfolio actual returns to average for implementing the constant annual spread method, the Board proposed creating the optimized portfolio for each year in the most recent ten-year period. For example, the 2004 pricing-year's constant annual spread would be based on the actual investment return performance from 1993 through 2002. The optimized portfolio for 1993 would be based on historical investment return performance from 1983 through 1992, the portfolio for 1994 would be based on performance from 1984 through 1993, and so on.

The key difference in the implementation methods is how the investment return is imputed for cost-recovery measurement purposes for the pricing year. Imputing the return under the actual return method requires applying the investment yields during the pricing year to the imputed investments. The constant annual spread method, however, simplifies the process during the year by applying the historical ten-year average portfolio spread over the current three-month Treasury bill rate.<sup>26</sup>

## 2. *Imputing the Actual Return*

The data in the table show the results of selecting an optimized portfolio for each year as described above and imputing the return as if the portfolio were held during that year.<sup>27</sup> The investments were chosen to optimize the return while placing a 35 basis point constraint on the standard deviation of the spread. Over the ten-year period, the asset mix is composed primarily of commercial paper or one-year Treasury notes and

<b>Actual Return Method</b>		
<b>Year</b>	<b>Spread over 3-month T-bill</b>	<b>NICB (millions)</b>
1993	0.29	\$78.4
1994	-0.19	\$43.1
1995	0.60	\$152.3
1996	0.18	\$101.2
1997	0.67	\$151.4
1998	0.37	\$118.4
1999	-0.37	\$35.4
2000	0.35	\$129.2
2001	0.44	\$111.7
2002	1.12	\$142.6
Average 10-year	0.35	\$106.4
Standard deviation	0.42	\$42.2

<sup>26</sup> A calculation of the optimized portfolio return will still be necessary, however, to factor into future pricing-years' constant annual spread.

<sup>27</sup> To eliminate fluctuations in implementation method results related to changes in clearing balances in the table, all clearing balance amounts are held constant throughout the analysis period. To construct the optimized portfolio, balances are held at the levels estimated for 2002 price-setting; investable balances are \$5,473 million and balances on which earnings credits are paid are \$5,892 million. To impute the results for each year, the balances are held at the 2004 level; investable balances are \$10,302 million and balances on which earnings credits are paid are \$9,711.



money market mutual funds. When holding clearing balance levels constant as in this example, fluctuations experienced using the actual return method reflect both variance in the Treasury bill rate and variance in the spread between the portfolio yield and the Treasury bill rate. The actual standard deviation associated with the actual return method over the ten-year period is greater than the 23 basis point standard deviation associated with the current imputed investment method. The actual standard deviation of the portfolio spreads is also greater than the 35 basis point standard deviation applied to select each year's optimum portfolio. The ten-year average NICB generated in this example would have been \$106.4 million with a standard deviation of \$42.2 million.

### 3. *Imputing the Constant Annual Spread*

During the development of this proposal, the Federal Reserve met with a group of representatives from banks, corporate credit unions, and their trade associations to obtain information about institution investment practices.<sup>28</sup> These representatives observed that construction of a risk-management framework and hypothetical portfolio appeared unduly complex for imputing income from hypothetical investments and suggested that a constant basis point calculation could be simpler and provide similar results. They suggested that the NICB calculation impute investment income based on a clearing balance investment yield expressed as a constant spread over the rate used to determine the clearing balance cost of funds. The representatives observed that this approach might be easier to understand, administer, and monitor.

Using a constant spread over the three-month Treasury bill rate to impute the income from investing clearing balances would, by definition, not reflect the actual variability within the year between the investment rate of return and the Treasury bill rate that would occur with the actual return method. Although investment income imputed using a constant annual spread would vary with fluctuations in the three month Treasury bill rate, finance theory suggests that a discount to the constant annual rate might be required to earn the consistency during the year that is produced by a constant spread method.

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<sup>28</sup> The advisory group included participants from the American Bankers Association, the Independent Community Bankers of America, and the Association of Corporate Credit Unions.

Unfortunately, historical mutual fund data needed to calculate NICB under the constant annual spread method are not available.<sup>29</sup> Conceptually, however, the averaging of the basis-point spreads in the constant annual spread method will reduce the basis-point fluctuations that otherwise would have occurred. Removing the fluctuations in the return related to the actual variability between the investment yield rate of return and the Treasury bill rate that would occur with the actual return method generates a higher return in some years than would have been experienced with the actual return method and a lower return in others.

Both commenters preferred the actual return method over the constant annual spread method. The commenters noted that the actual return method is more transparent and more representative of BHC practices. One commenter stated that the need to demonstrate that the constant annual spread would be achievable with the actual portfolio would result in the same level of effort as the actual return method.

The Board agrees with the industry representatives that the constant annual spread method reduces some complexity associated with the imputation process during the pricing year. The Board believes that while neither method can exactly simulate banking industry practices, the constant annual spread method provides a reasonable proxy for the return a BHC would receive with similar investments. As a result, the pricing-year administrative burden is somewhat reduced with the constant annual spread method.

The Board has adopted the constant annual return method for imputing income on investments for the NICB calculation. Each pricing year, the constant annual spread will be determined based on an optimized investment portfolio, subject to the risk-management framework. The constant annual spread will be determined based on the actual return from the optimized investment portfolio in each of the most recent ten years. The constant spread will be calculated as the difference between the portfolio rate of return and the three-month Treasury bill rate. NICB for 2004, using the constant annual

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<sup>29</sup> In order to model the results that the constant annual spread method would have produced for years prior to 2004, returns for years prior to 1993 would need to be simulated. Those simulated portfolios would, in turn, be based on optimum portfolios that include years prior to 1983, the earliest year for which required data are available.

spread method with a 35 basis point spread shown in the table, is estimated to be \$52.7 million.<sup>30</sup>

### **III. Competitive Impact Analysis**

All operational and legal changes considered by the Board that have a substantial effect on payments system participants are subject to the competitive impact analysis described in the March 1990 policy statement “The Federal Reserve in the Payments System.”<sup>31</sup> Under this policy, the Board assesses whether the change would have a direct and material adverse effect on the ability of other service providers to compete effectively with the Federal Reserve in providing similar services because of differing legal power or constraints or because of a dominant market position of the Federal Reserve deriving from such legal differences. If the fees or fee structures create such an effect, the Board must further evaluate the changes to assess whether their benefits – such as contributions to payment system efficiency, payment system integrity, or other Board objectives – can be retained while reducing the hindrances to competition.

These changes are intended to expand the investments assumed in the NICB calculation to resemble more closely investments pursued by bank holding companies, the services of which are considered to resemble most closely the services provided by Reserve Banks. Imputed investment decisions would be made within a framework that incorporates risk-management measures used in industry and regulatory practice. Accordingly, the Board believes these changes will not have a direct and material adverse effect on the ability of other service providers to compete effectively, due to legal differences, with the Federal Reserve in providing similar services.

### **IV. Method for Imputing Investment Income on Clearing Balances**

The Board has adopted the following modifications to the method for imputing investment income on clearing balances:

- Investment income for each pricing year will be imputed based on the average annual spreads between the investment yields and three-month Treasury bill rates that would

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<sup>30</sup> The two-year lag in data is consistent with the PSAF method, which uses audited financial statements for the top 50 BHCs from this period, and is necessary because complete 2003 actual return data not yet available.

<sup>31</sup> FRRS 9-1558

have been realized on investments made in the most recently available 10-year period based on portfolios optimized as described below. The selected spread will be held for the pricing year.

- Imputed investments will be selected from those available to banks and BHCs. The imputed portfolio for each year will be optimized and subject to a risk management framework. The portfolio will be optimized based on the most recent ten-year historical data to maximize the return that could have been realized over that entire ten-year period within the risk management framework.

The risk management framework consists of the following:

- A core amount of clearing balances, currently \$4 billion less core balances use to fund long-term assets in the PSAF calculation, is available to invest in longer-term instruments.
- The earnings at risk measure will be used as a constraint to manage shorter-term interest rate risk. Assuming a 200 basis point change in both the yield on relevant assets and the cost of all relevant liabilities, the effect to priced services recovery will be limited to a change of 200 basis points.
- The EVE measure is adopted as a constraint to manage longer-term interest rate risk, subject to a limit on the effect to equity of 8 percent resulting from a 200 basis point change in the asset yield and clearing balance rates.
- Investments will be limited to maintain the FDIC's minimum risk-based capital ratio for a well-capitalized institution, which is currently 10 percent.

By order of the Board of Governors of the Federal Reserve System,  
October XX, 2003.

Jennifer J. Johnson,  
Secretary of the Board.  
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