FEDERAL RESERVE SYSTEM

[Docket No. OP-1229]

Federal Reserve Bank Services Private Sector Adjustment Factor

AGENCY: Board of Governors of the Federal Reserve System.

ACTION: Notice with request for comments.

SUMMARY: The Board requests comment on potential modifications to the method for calculating the target return on equity (ROE) in the private-sector adjustment factor (PSAF). The PSAF imputes the costs that would have been incurred and profits that would have been earned had the Federal Reserve Banks' priced services been provided by a private firm. The Monetary Control Act of 1980 (MCA) requires that the Federal Reserve set fees for its services to recover, over the long run, its actual costs of providing the services, as well as the imputed costs and profits. The Board reviews its method for calculating the PSAF periodically to assess whether it is still appropriate in light of the changing business and regulatory environment, industry practices, and accounting standards.

Specifically, the Board requests comment on possible changes to the current method to compute a target rate of return on equity capital, including changes to the analytical models and peer group institutions used. The Board's method for setting its overall level of equity capital would continue to be based on the Federal Deposit Insurance Corporation (FDIC) guidelines for a well-capitalized institution for insurance premium purposes.

DATES: Comments must be submitted on or before July 22, 2005.

ADDRESSES: You may submit comments, identified by Docket No. OP-1229, by any of the following methods:

- Agency Web Site: http://www.federalreserve.gov. Follow the instructions for submitting comments at http://www.federalreserve.gov/generalinfo/foia/ProposedRegs.cfm.
- Federal eRulemaking Portal: http://www.regulations.gov. Follow the instructions for submitting comments.
- E-mail: regs.comments@federalreserve.gov
- FAX: 202/452-3819 or 202/452-3102.
- Mail: Jennifer J. Johnson, Secretary, Board of Governors of the Federal Reserve System, 20th Street and Constitution Avenue, N.W., Washington, DC 20551.

All public comments are available from the Board's web site at www.federalreserve.gov/generalinfo/foia/ProposedRegs.cfm as submitted, except as necessary for technical reasons. Accordingly, your comments will not be edited to

remove any identifying or contact information. Public comments may also be viewed electronically or on paper in Room MP-500 of the Board's Martin Building (20th and C Streets, N.W.) between 9:00 a.m. and 5:00 p.m. on weekdays.

FOR FUTHER INFORMATION CONTACT: Gregory L. Evans, Assistant Director (202/452-3945), Brenda L. Richards, Financial Project Leader (202/452-2753), or Jonathan Mueller, Financial Analyst (202/530-6291); 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 MCA requires that the Board establish fees for "priced services" provided to depository institutions at a level necessary to recover all direct and indirect costs actually incurred and imputed costs. Imputed costs include financing costs, return on equity capital (profit), taxes, and certain other expenses that would be incurred if a private business firm provided the services. The imputed costs and imputed profit are collectively referred to as the private sector adjustment factor (PSAF). In establishing fees, the Board considers the objectives of fostering competition, improving the efficiency of the payments mechanism, and providing an adequate level of services nationwide.

The methodology underlying the PSAF is reviewed periodically to ensure that it is appropriate and relevant in light of changes that may have occurred in Reserve Bank priced-services activities, accounting standards, finance theory, and regulatory and business practices.[1] The Board considers four principles when reviewing the PSAF methodology: (1) providing a conceptually sound basis for efficient pricing in the market for payments services, (2) maintaining consistency with actual Reserve Bank financial information and practice, (3) maintaining consistency with private-sector practice, and (4) using data in the public domain in order to make the PSAF replicable. In addition, the Board seeks to balance the cost, complexity, and accuracy of the PSAF methodology in implementing theoretically sound approaches.[2]

The Board seeks to establish fees for priced services to recover projected costs and the PSAF over the long run. Because the Board does not believe that price volatility increases efficiency in payment systems, it has been wary of cost-recovery models that produce volatile results from year to year. For this reason, fees for each year are not set to offset any previous or subsequent years' overrecovery or underrecovery. Moreover, other providers of payment services do not typically establish prices in order to eliminate

[1] During the development of this proposal, the Federal Reserve worked with a consulting firm specializing in capital allocation and risk management and four finance professors from U.S. academic institutions to obtain information about current private-sector practices.

[2] The previous review of the PSAF was completed in 2001 (65 FR 82360, October 10, 2001) and changes were implemented for the 2002 PSAF.

surpluses or shortfalls incurred in previous years. A highly volatile PSAF applied mechanically to the fee-setting process could also result in unnecessarily volatile prices, which, in turn, could adversely affect the efficient operations of the Reserve Banks and other payment service providers. As a result, the Board has preferred, when appropriate, to adopt PSAF methods that provide for stable rather than volatile returns.

II. Private Sector Adjustment Factor

The current method for calculating the PSAF includes determining the book value of Federal Reserve assets and liabilities to be used in providing priced services during the coming year, and the rates used to impute financing costs. The Board's method involves developing an estimated Federal Reserve priced-services pro forma balance sheet using actual priced-services assets and liabilities. The remaining elements on the balance sheet, such as equity, are imputed as if these services were provided by a private-sector firm. To satisfy the FDIC requirement for a well-capitalized institution, equity is imputed at 5 percent of total assets.[3] In 2005, assets are projected to total $16.2 billion, resulting in imputed equity capital of $808 million.

A target ROE is estimated and applied to the equity capital on the pro forma balance sheet to determine the priced-services cost of equity.[4] Currently, the ROE is calculated by averaging the results of three analytical models: the comparable accounting earnings (CAE) model, the discounted cash flow (DCF) model, and the capital asset pricing model (CAPM). The top fifty bank holding companies (BHCs) based on deposit balance serve as the peer group for Federal Reserve priced services and the peer group's financial data is used to estimate the target ROE. Selecting the BHCs based on deposit balances was intended to maintain the focus on the largest banking entities because they process transactions and perform settlement services comparable to those provided by the Reserve Banks.

The CAE model uses historical BHC accounting information to estimate ROE. The ROE for an individual BHC in the peer group is calculated as the ratio of the firm's net income before taxes to its book value of equity and is averaged with other BHCs to determine the peer group ROE. The DCF model takes a forward-looking approach to estimating ROE. It assumes that a firm's stock price is equal to the discounted present value of all expected future dividends. The CAPM captures the risk—return relationship that rational investors require in efficient markets. The underlying theory of the model assumes that investors demand a premium for bearing risk; that is, the higher the risk of the security, the higher its expected return must be to attract investors to buy it. The

[3] Equity is imputed based on the FDIC definition of a "well-capitalized" institution for insurance premium purposes. The FDIC requirements for a well-capitalized financial institution are 1) a ratio of total capital to risk-weighted assets of 10 percent or greater; and 2) a ratio of Tier 1 capital to risk-weighted assets of 6 percent or greater; and 3) a leverage ratio of Tier 1 capital to total assets of 5 percent or greater. The Federal Reserve priced-services balance sheet total capital has no components of Tier 1 or total capital other than equity; therefore, requirements 1 and 2 are essentially the same measurement. Because risk-weighted assets are considerably below actual assets, only requirement 3 is binding for the Federal Reserve priced services.

[4] For the 2005 PSAF, the target ROE of 18.1 percent is multiplied by the equity capital of $808 million to get the priced services cost of equity of $146 million.

basic principle of CAPM is that the required rate of return on a firm's equity is equal to the return on a risk-free asset plus a risk premium.

The PSAF also includes imputed taxes, which are captured using a pretax ROE. A pretax ROE assumes that a 100 percent recovery of expenses, including the targeted ROE, is achieved. The PSAF tax rate is the median of the rates paid by the fifty BHCs in the peer group over the past five years. Finally, the PSAF includes the estimated share of the Board of Governors' expenses that supports priced services, imputed sales tax, and an imputed assessment for FDIC insurance.

III. Discussion

A. Overview

The Board is considering changes to the methodology used to estimate the target ROE for priced services. The table below summarizes the current methodology and the changes considered, which are discussed in more depth in subsequent sections of the notice.

Table 1

	Current Methodology	**Considered Changes to the Current Methodology**
ROE	Average of the CAE, DCF, and CAPM models	CAPM only
CAPM methodology:		
Risk-free investment horizon (risk-free rate)	Short-term horizon	Longer-term horizon with a term premium adjustment
Beta assumptions	Historical beta	1) Beta of 1.0 (overall market) 2) Adjusted beta (weighting historical beta and beta of 1.0)
Historical beta methods		
Peer group	Fifty largest BHCs by deposit balance	Select the BHCs that meet the following criteria: 1) The fifty largest by deposit balance 2) The fifty largest by due-to balance 3) Capital to risk-weighted asset ratio of within +/- 20% of the imputed Reserve Bank ratio 4) Investment-grade bond ratings
Beta estimation period	Rolling sample period of 10 years	Rolling sample period of 5 years
Weighting of beta	Weight each BHC's returns by market capitalization	Weight each BHC's returns equally

B. Imputed Return on Equity

The target ROE for Reserve Bank priced-services activities is established at the entity level rather than by developing an ROE for each service. Conceptually, the ROE is developed with a shareholder's perspective in mind and considers whether shareholders are adequately compensated in the form of average equity returns given the overall risk of the business activities.

Current Three-Model Approach

As discussed earlier, the Board targets an ROE using the average of the results of the CAE, DCF, and CAPM models. The three economic models use different inputs and provide different outlooks when determining a unique target ROE.

1. Comparable Accounting Earnings Model

The CAE model's sole source of data is peer group historical accounting information. The annual ratios of net income before taxes to equity of the individual BHCs are averaged to determine the peer group ROE. The arithmetic average of the last five years' individual ROEs is the CAE ROE.

This model is appealing because it is directly related to the published financial statements of BHCs. Because the priced-services ROE is applied to the book value of equity, the CAE is also the only model that is consistent with the pro forma presentation that is used to measure cost recovery and compliance with the MCA. The CAE model's primary shortcomings are that it relies exclusively on historical data reported on a book value basis to project an expected market rate of return and does not incorporate future earnings expectations. The ROE results for any point are substantially anchored in past accounting book values, and book values can be less relevant to investors than market-based measures of a firm's financial condition. The CAE results can be particularly unrealistic during periods when there are large fluctuations in business cycles. These shortcomings were identified when the three-model approach was adopted in 2001; however, the Board believed the CAE results complemented the market-driven results of the DCF and CAPM models when the results of all three models were averaged.

2. Discounted Cash Flow Model

The DCF approach requires as inputs the BHC peer group stock prices as well as forecasts of future dividends and long-term dividend growth rates.[5] The implied discount rate of a firm can be calculated and considered the firm's estimated ROE in the DCF model if the stock price and expected future dividends are known. The ROEs for

[5] Consensus earnings forecasts and long-term growth rates (as published by the Institutional Brokers Estimate System) are translated into future dividend cash flows.

individual BHCs are combined using a weighted average based on each BHC's equity market capitalization. The formula for the DCF model is

$$ROE_{\text{Fed priced services}} = (D_1 / P_0) + g$$

D_1 = expected dividend next year ($(D_0 * (1+g))$)
P_0 = current price per share of equity
g = expected dividend growth rate

The DCF model was adopted for the ROE calculation because it incorporates projections of future shareholder market returns, which are not reflected in the CAE or CAPM models. The DCF model can be a powerful valuation tool; however, meaningful results depend on analysts' ability to project cash flow and dividend growth rates accurately. Financial market history has shown the inherent difficulty faced by analysts in developing accurate financial projections given the rapid shifts in business activities as a result of increased competition, changes in the regulatory environment, technological obsolescence, and other forces.

3. Capital Asset Pricing Model

CAPM's basic principle is that the required rate of return on a firm's equity is equal to the return on a risk-free asset plus a risk premium. The risk premium is a measurement of the expected excess return on a market portfolio of equities (the expected market risk premium) and the correlation of the firm's returns to the market returns (beta).

$$ROE_{\text{Fed priced services}} = Rf + \overbrace{[Beta_{\text{Fed priced services}} * \underbrace{E(Rm - Rf)}_{\textit{Expected Market Risk Premium}}]}^{\textit{Risk Premium}}$$

Rf	= risk-free rate of return
$Beta_{\text{Fed priced services}}$	= beta for the priced-services peer group
Rm	= return of the overall market
E(Rm – Rf)	= expected market risk premium
$Beta_{\text{Fed priced services}} * E(Rm - Rf)$	= risk premium

The CAPM requires judgment in determining

- The risk-free interest rate or the rate of return on an investment with no or low risk, typically measured using a Treasury rate.
- The method, data, and period used for estimating the beta. The beta measures the market risk of a particular company relative to the risk of the overall market. A beta of 1.0 signifies that a firm's returns will be perfectly correlated

with the market and move up or down with the market's return (dividends and capital gains and losses). A beta of less than 1.0 indicates that a firm's returns fluctuate less than the market (less risky); while a beta greater than 1.0 indicates that a firm's returns tend to vary more than the market (more risky).

- The market risk premium, which estimates the additional return investors require to forgo the safety of investing in no or low-risk assets to bear the higher risk of common stock.

The CAPM provides a framework to determine the risk—return relationship required by investors. Because CAPM measures the relevant market risk of a firm's stock and the contribution of the firm's stock to the market risk of a well-diversified portfolio, CAPM can be applied to many business decisions. For example, investors, who are concerned with market risk when holding diversified portfolios, can use CAPM to make portfolio management decisions and balance the risk—return tradeoff. Business managers, who are concerned with maximizing the return to shareholders, can also use CAPM to make financing decisions because CAPM produces the required rate of return expected by the market. As a practical matter, not all financial models, including CAPM, will necessarily produce accurate estimates unless the decisionmaker exercises some judgment to adjust for risks that the models do not measure. In addition, CAPM can produce varying results that may not accurately predict future performance, depending on the formula inputs. Nevertheless, CAPM is a useful conceptual tool because it represents the way rational people would behave when managing risk and making financing decisions.

Because the results of the CAPM are sensitive to the inputs, they are critical to the model's usefulness. The risk-free rate is a significant factor because it both is used to determine the market risk premium and also is added to the risk premium of the peer group in the CAPM calculation. Currently, the Board uses the constant maturity yield on the one-year Treasury bill as the risk-free rate. The monthly stock returns over a rolling ten-year period are used in a linear regression technique to estimate the peer group beta.[6] To capture each BHC's involvement in similar service activities, the returns of each BHC in the peer group are weighted by market capitalization. The market risk premium is estimated using the monthly excess return of the market over the risk-free rate since 1927, which is standard finance practice.[7]

4. Results of the Current Three-Model Approach

The following table shows Reserve Bank priced services pretax and after-tax ROE targets from 2001 to 2005 using each of the three models. Table 2 highlights the CAPM's sensitivity to interest rates, which has made it much more variable from year to year than the other two models. As rates fell from 2001 to 2005, the CAPM produced an

[6] Linear regression uses variables, such as the BHCs' equity returns and the market's return, and estimates a relationship between them in the form of a straight-line.

[7] The market risk premium data are found on the Kenneth R. French website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french). Stock return data are obtained from the Center for Research in Security Prices.

ROE that is much lower than the ROEs produced by the CAE or DCF models. Conversely, during periods of higher interest rates such as the 1980s, the CAPM produced higher ROE results than the CAE or DCF. Over the eighteen-year period of 1983-2000, the average ROE of the CAPM was the highest of all three models at 15.1 percent, followed by the CAE at 11.4 percent and the DCF at 13.0 percent.

Table 2
Return on Equity
Current methodology using the top fifty BHCs by deposit balance
(data in percent)

	Pretax				After-tax			
PSAF Year	CAE	DCF	CAPM	Average	CAE	DCF	CAPM	Average
2001	23.2	22.1	23.3	22.8	15.9	15.1	16.0	15.6
2002	23.5	21.4	21.4	22.1	16.6	15.1	15.1	15.6
2003	22.9	21.6	13.8	19.4	16.0	15.0	9.6	13.5
2004	22.3	21.3	12.2	18.6	15.7	15.0	8.5	13.0
2005	22.2	19.7	12.3	18.1	15.6	13.9	8.7	12.7
5-year Average	22.8	21.2	16.6	20.2	16.0	14.8	11.6	14.1
Standard Deviation	0.6	0.9	5.3	2.1	0.4	0.5	3.7	1.4

The three models for calculating the target ROE are based on different assumptions, analytical approaches, and data sources. Because each of the three models brings a different perspective to a firm's cost of equity capital, the Board concluded that a simple average of the three was a better measure of the peer group's ROE than any single model by itself. Support for this approach was found in academic studies that demonstrated that the use of multiple models can improve estimation techniques when each model provides new information. Taking the average of the three models was seen as a way to minimize the effect of unusual data and provide a less-volatile ROE over time. In recent years, however, academic, market, and financial services industry practices have evolved, and the weaknesses of the CAE and DCF have become more widely recognized. As a result, reliance on the CAE and DCF for targeting a firm's ROE has declined.

The Board requests comment on alternative methods to calculate the target ROE. Are there models, other than the three in use, that the Board should consider? What is considered to be a reasonable target ROE for institutions that provide services similar to those provided by the Reserve Banks?

Possible change to the imputed ROE methodology

To implement the principle of maintaining consistency with private-sector practice, the Board reviewed current finance theory and practice to determine whether the current PSAF methodology, and in particular the three-model approach, is the most appropriate method for computing the ROE. When the Board adopted the current three-model approach, there was evidence that multiple models were being used by academics and professionals to estimate ROE.[8] Current information suggests, however, that CAPM has continued to evolve and is used more in practice than the CAE and DCF methods.[9] Specifically, the CAE method, while not widely used at the time of the last study, has continued to wane in use. Similarly, the effectiveness of the DCF as a tool for estimating ROE has also been questioned based on recent research findings that analysts' dividend projections can be upwardly or downwardly biased.[10] Although some public utilities still use the results of the DCF model together with CAPM for developing ROE targets, it is not used by many larger financial institutions.[11] With information suggesting that two of the three models that are used in the current ROE method might not be in line with common practice, the Board is considering discontinuing using the average of the results of three models and use CAPM only to calculate the target ROE. While CAPM has the virtue of being a forward-looking, market-based measure of ROE that incorporates the fundamental risk—return relationships required by rational investors and is the most widely accepted and used model for calculating ROE, it also continues to be the most volatile of the methods, as shown in table 2. The volatility comes from the estimates and assumptions required to calculate the ROE.

The Board requests comment on whether the CAPM methodology is appropriate to rely on to estimate a target ROE. What important elements of the ROE calculation might be excluded if the Board adopts the CAPM-only method? Are there considerations that do not support the use of CAPM to impute the Reserve Banks' target ROE? Is the DCF model used to estimate a target ROE? What earnings estimates are the most useful? Are recent published accounting earnings relevant when estimating a target ROE? Is the volatility of the CAPM-only method acceptable? Should CAPM-only be viewed as a method to develop an ROE that may be modified; if so, why and how would one modify the model?

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[8] For example, when the current method was adopted, the New York State Public Service Commission was considering using an average of different ROE measures to determine the cost of equity capital for utilities it regulates.

[9] R.F. Bruner, K.M. Eades, R.S. Harris, and R.C. Higgins, 1998 "Best Practices in Estimating Cost of Capital: Survey and Synthesis," *Financial Practice and Education*, and J.R. Graham, and C.R. Harvey, 2001 "The Theory and Practice of Corporate Finance: Evidence from the Field," *Journal of Financial Economics*, find that CAPM is the dominant model for estimating cost of equity. In addition, most textbook treatments of equity cost of capital calculations are based on the CAPM model (for example see www.Damodaran.com).

[10] Louis K.C. Chan, Jason Karceski, and Josef Lakonishok, "Analysts' Conflict of Interest and Biases in Earnings Forecasts" March 2003, NBER Working Paper 9544, find evidence that analysts manipulate forecasts downward so that firms are positioned for positive earnings surprises at announcement dates. Patricia M. Deschow, Amy Hutton, and Richard Sloan, "The Relation between Analysts' Forecasts of Long-term Earnings Growth and Stock Price Performance Following Equity Offerings" Contemporary Accounting Research, Spring 2000, find that analysts' projections may be overly optimistic because fees paid to analyst's firms are correlated to optimistic projections.

[11] J.H. Vander Weide, 2004. Prepared Testimony for the Pacific Gas and Electric Company Cost of Capital 2004 and 2005 Submission to the California Public Utilities Commission.

C. Possible CAPM methodology modifications

Regardless of whether a CAPM-only method for ROE is adopted, the Board is considering whether the current CAPM methodology should be modified to better reflect comparably positioned service providers, the aims of the MCA, and current academic and professional practice.[12] As previously noted, CAPM requires judgment to determine the inputs that should be used for each aspect of model. The Board is considering modifying the risk-free investment horizon and the beta assumptions, including the peer group used to estimate beta, the beta estimation period, and the weighting of the peer group betas in CAPM.

Risk-free investment horizon

The CAPM risk-free parameter in the Board's current method for calculating the target ROE is based on a one-year Treasury bill rate. The Treasury security is considered to be risk-free, and this short-term rate was chosen to match the time horizon of the target ROE.[13] There are competing views about whether a short-term or long-term risk-free rate is more appropriate in the CAPM. One point of view is that a short-term risk-free rate is consistent with an underlying tenet of CAPM that suggests that the market for a security is liquid and matches the time horizon of a short-term investor. This approach is consistent with the yearly price-setting for Federal Reserve services. Another point of view advocates using a long-term risk-free rate, such as the ten-year Treasury bond rate, because it more closely matches the duration of investments, the duration of stock market indexes used to estimate a beta, and the investment horizon of a long-term investor. It may also be considered to be more in line with the MCA's requirement for the Federal Reserve to recover all costs of providing its services over the long run. In this approach, a target ROE should represent return that the firm hopes to achieve on average over the fluctuations of the business cycle. When considering what risk-free rate term to use, generally the time horizon of the investor is matched with term of the risk-free security. If investment in the Reserve Banks' activities is assumed to be long term, this approach would support using the yield on a longer-term Treasury instrument as the risk-free rate in the CAPM to calculate the Reserve Banks' priced-services target ROE.

Rates on short-term Treasury bills are subject to more volatility than longer-term Treasury securities because they are more sensitive to economic conditions. Historically, the yields on short- and long-term Treasury securities generally move in the same

[12] As part of the current review, the Board examined whether economic factors other than the overall market return significantly affect the stock returns of the BHC peer group. In the analysis, alternative multifactor CAPMs that included BHC payments-related revenue shares and macroeconomic interest rate spreads were analyzed. The analysis suggests that the current standard CAPM and equity betas used to estimate ROE are reasonable. See "Alternative Measures of the Cost of Equity Capital for the Federal Reserve Banks' Payments Services: Technical Supplement to the 2004 PSAF Review" by Barnes and Lopez (http://www.federalreserve.gov/boarddocs/press/other/2005/20050518/supplement.pdf).

[13] Although the priced-services ROE is recomputed each year, the Board considered the difference between a one-year rate based on the average of monthly, three-month, or one-year Treasury bill rate insignificant because Treasury securities do not have significant pricing anomalies across short-term maturities.

direction, with long-term securities offering higher yields, on average, than the yields provided by short-term securities. Volatility of the short-term Treasury rate could produce widely-varying CAPM ROE estimates and adversely affect the pricing of the Federal Reserve's services. To the extent that the Reserve Banks adjust prices each year to recover a fluctuating ROE, a more-stable ROE may lead to more-stable prices, which is consistent with the Federal Reserve's objective to promote efficient payments operations.

As mentioned earlier in this notice, the expected market risk premium (E(Rm – Rf)) data are gathered from a third-party source. This is a widely accepted and easily accessible source, and the data are calculated with short-term risk-free rates, which is standard practice because investors can buy or sell securities in the short term. Because the risk-free rate is used in two parts of the CAPM equation, however, inconsistency is introduced in the equation when a long-term investment horizon is combined with the short-term expected market risk premium from the third-party source. To maintain consistency, the constant maturity yield on the ten-year Treasury bond, less a term premium, could be used as an estimate of the risk-free rate (Rf). Empirical analyses show that, on average, longer-term Treasury securities have higher yields. This term premium, estimated using the historical difference between short- and long-term Treasury securities, would be used to adjust a long-term rate in order to reflect an average expected short-term risk-free rate over a ten-year horizon.[14,15]

Table 3 compares the ROEs that result from using the one-year versus the ten-year risk free rate in the CAPM calculation. For illustrative purposes, the beta is assumed to equal 1.0 to isolate the effect of using a short- and longer-term rate on the current methodology. For 2005, there is a difference of 1.6 percentage points between the after-tax ROE calculated when using a short-term risk-free rate and a long-term risk-free rate adjusted by the term premium.

Table 3

	Current CAPM	**Considered CAPM**		**Memo**
2005 CAPM ROE	1-year risk-free rate	10-year risk-free rate less term premium	Difference	10-year risk-free rate
Pretax	13.2%	15.5%	2.3	17.4%
After-tax	9.3%	10.9%	1.6	12.2%
Beta	1.0	1.0	0	1.0

[14] As reported in the H.15 Historical Releases report published by the Board of Governors. The H.15 provides the constant maturity yield (annualized) for various term Treasury securities on a monthly basis.

[15] The term premium is estimated at 1.34 percent, which is the arithmetic average of the difference between the ten-year Treasury bond yield and the one-month Treasury bill yield from 1959-2003 based on data from the Federal Reserve Board H.15 statistical release and Ibbotson Associates.

The Board requests comment on the time horizon for estimating a target ROE. Should the Federal Reserve's priced-services target ROE for the upcoming year be based on a short-term rate, which might reflect what the market expects its peers to deliver in the upcoming year, or should the target ROE be calculated using a long-term rate, which might better reflect the return that the market expects its peers to deliver, on average, over time? The Board also requests comment on the reasonableness of incorporating a ten-year Treasury bond less a term premium to reflect an expected average short-term risk-free rate over a ten-year horizon. What are other factors that could be used to incorporate a long-term time horizon?

Beta assumptions

A beta measures the sensitivity of the peer group returns to the overall market's returns. In order to calculate a beta representative of the Federal Reserve priced-services activities, a comparable peer group is needed. When the peer group is identified, the most relevant and appropriate methods to use for the beta calculation can be determined.

1. Peer group

Although BHCs' activities are not a perfect proxy for Reserve Bank priced-services activity, they provide similar services through their correspondent banking activities, including payment and settlement services. They also hold respondent ("due-to") balances, which are similar to depository institution balances held by Reserve Banks, and have publicly available information; therefore, they are the most reasonable alternative.[16] One drawback to using BHCs as the proxy is that they offer diverse services with different risk profiles that reach well beyond the payment services that are provided by the Reserve Banks, such as consumer and corporate lending and investment services. To reduce the effect on the ROE of these noncomparable services in which BHCs are involved, the Board is also considering looking at the level of a BHC's involvement in correspondent banking activity, its capital structure, and its solvency ratings in refining the BHC peer group to better match the Federal Reserve priced-services activities.

To choose peers whose activities are more comparable to the Federal Reserve priced services, the Board is considering a peer group that meets all of the following criteria.

1. The BHCs among the top fifty publicly traded BHCs based on deposit balances.

[16] BHC due-to balances are bank deposits reported on the books of the individual institutions that make up the BHC, which originate from other banks and represent respondent balances held to provide transaction processing and settlement services.

2. The BHCs among the top fifty publicly traded BHCs based on their level of due-to balances. By using deposit and due-to balances, the peer group would represent publicly traded entities that provide correspondent banking services and have several years of financial data available in the public domain.[17] This selection criteria may result in a peer group of BHCs that hold both retail and correspondent deposits and are more involved in transaction processing and settlement services.

3. To more closely relate the peer group members' capital structure and risk-weighted asset ratios to the Federal Reserve's priced-services imputed capital structure, the Board is considering further refining the selection process by choosing BHCs that have a ratio of Tier 1 capital to risk-weighted assets similar to Reserve Bank priced-services activities (plus or minus 20 percent).[18]

4. To create a peer group that has a solvency rating similar to that of the Federal Reserve's priced-services activities if the Federal Reserve were a private firm, the peer group could be further narrowed by including only the BHCs that have an investment-grade solvency rating.

Attachment I shows the resulting peer group (cross-matched peer group) of twenty BHCs that results from these selection criteria using publicly available data as of December 2003.[19] To minimize the complexity involved in capturing the due-to balances for the peer group, the Board is considering assuming that the largest three hundred BHCs by deposit balance includes the top fifty BHCs by due-to balance.[20]

An alternative the Board is also considering could eliminate deposit balances as a selection criterion and use the three remaining criteria to select a peer group, while limiting to twenty-five the number of institutions to which it would be applied. Choosing the peer group by the largest due-to balances and not considering their level of deposit balance may result in a peer group that is more focused only on correspondent banking activities. When the peer group is composed of the top twenty-five institutions based on their level of due-to-balances that also meet the Tier 1 capital to risk-weighted assets ratio and solvency rating filtering criteria, the peer group is narrowed to seventeen of the twenty institutions that resulted from the cross-matching of deposit and due-to balances.[21]

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[17] Choosing BHCs that have been traded for five years allows the Federal Reserve to use BHC market returns in the other models used to determine a target ROE. The number of years in the selection criteria would change if more or fewer market data observations were needed.

[18] The Tier 1 capital to risk-weighted assets ratio for the 2005 PSAF was 10.8 percent. Choosing a BHC within +/- 20 percent of the capital to risk-weighted asset ratio (8.6 percent to 13.0 percent for the 2005 PSAF) would capture a reasonable number of BHCs with similar capital structures and risk-weighted assets.

[19] The PSAF calculation uses data from audited financial statements of the peer group. The data used for the 2005 PSAF calculation is based on year-end 2003 data because this is the most recent publicly available information at the time of the calculation.

[20] Due-to balance data are available only at the bank level and must be aggregated to get to the BHC level.

[21] Of the top twenty-five institutions based on due-to-balances, three are not publicly traded and five do not have a Tier 1 capital to risk-weighted asset ratios similar to Reserve Bank priced services.

Although the cross-matched peer group is smaller than the top fifty BHC peer group by deposit balance, the majority of the top fifty BHCs by deposit and due-to balances is accounted for in the cross-matched peer group. For example, the cross-matched peer group consists of 67 percent of the deposits of the top fifty BHCs by deposit and 59 percent of the due-to balances of the top fifty BHCs by due-to balance.

The Board requests comment on this modified approach to selecting a peer group, and in particular on the following questions. What factors should be considered when determining the Federal Reserve's priced-services peer group? Is selecting a peer group based on deposit balances, due-to balances, or a combination of both an appropriate peer group selection criterion? Is there other criteria the Board should consider? Do the Tier 1 capital-to-risk-weighted assets ratio and solvency rating filters improve the selection method?

2. Beta estimation period

In the current method, the beta is estimated from a rolling ten-year period of monthly stock returns for each BHC in the peer group. Different sample periods result in different betas, with a longer period producing a beta that is less sensitive to unusual market variations and a shorter period having an opposite effect. The rolling ten-year period was adopted because it provides a sufficient number of market observations to mitigate the effect of market variations on the calculation.

The Board is considering calculating the beta using monthly returns from the market over a rolling five-year period rather than a rolling ten-year period. Some financial sources suggest that using more years of historical data to calculate the beta may be less relevant to the firm's future returns than fewer years would be, because the nature of business risks undertaken by firms may have changed significantly over ten-years. The shorter period is less likely to distort ROE results because it excludes some past structural changes in the banking industry and in the financial markets that no longer reflect current BHC peer group risk profiles. In addition, a five-year data period could provide a reasonable number of observations to estimate the peer group beta. Table 4 compares the 2005 CAPM ROEs of the current peer group to the CAPM ROEs of the cross-matched peer group using a long-term risk-free rate less a term premium.[22] Using the five-year rolling period results in a lower ROE for both peer groups because the peer group BHCs' returns compared to the market's returns have been less volatile over the five-year period than over the ten-year period.

[22] For ease in illustration, only the cross-matched peer group of due-to/deposit balances will be compared to the current peer group throughout the remainder of this notice.

Table 4[23]

	Cross-matched peer group			Current peer group		
2005 CAPM ROE	10-year rolling period	5-year rolling period	Difference	10-year rolling period	5-year rolling period	Difference
Pretax	15.3%	13.4%	-1.9	14.8%	12.7%	-2.1
After-tax	10.7%	9.5%	-1.2	10.4%	8.9%	-1.5
Beta	0.98	0.82	-0.16	0.94	0.75	-0.19

The Board requests comment on the beta estimation period. Does a rolling five-year period or a rolling ten-year period better capture elements that are relevant to calculating a meaningful beta for estimating the Reserve Bank priced-services ROE?

3. Weighting of the peer group betas

In the current method to determine the priced-services beta in CAPM, the returns of each BHC in the peer group are market-value weighted and are compared with the overall market returns. In effect, value weighting assumes that a firm's payments business is proportional to its market capitalization level. As BHCs become more involved in nonpayment-related businesses, however, the extent to which market capitalization is representative of a BHC's payments activities and its usefulness to weight the betas is uncertain. Value weighting, therefore, may not produce an appropriate beta to serve as the proxy for the Reserve Banks' priced-services activities.

The Board is considering calculating the priced-services beta using the equal-weighted returns of each BHC in the peer group rather than value-weighted returns as a better approximation of the appropriate peer group. Equal-weighted and value-weighted averages of betas from 2001 to 2005 for each BHC in the cross-matched peer group are shown in attachment II. The difference between the betas, using equal-weighting or value-weighting, with the cross-matched peer group of twenty BHCs, varies. For 2001 and 2005, equal-weighting are .12 and .20 lower than value-weighting, respectively.

Table 5 compares the ROEs that result from applying the two different weighting schemes with the returns for each peer group using a long-term risk-free rate less a term premium. For the 2005 CAPM after-tax ROE using the cross-matched peer group, the difference between equal-weighting and value-weighting is 2.0 percent.

[23] A minor modification to calculate beta produces slightly different ROE results when comparing the current CAPM calculation, shown in the first row, with the current 2005 CAPM calculation shown in table 2.

Table 5

	Cross-matched peer group (5-year rolling period)			**Current peer group** (5-year rolling period)		
2005 CAPM ROE	Value-weighting	Equal-weighting	Difference	Value-weighting	Equal-weighting	Difference
Pretax	13.4%	10.6%	-2.8	12.7%	9.7%	-3.0
After-tax	9.5%	7.5%	-2.0	8.9%	6.8%	-2.1
Beta	0.82	0.57	-0.25	0.75	0.49	-0.26

The Board requests comment on what weighting method is appropriate to best capture the business risk of a peer group. Is equal-weighting or value-weighting the returns of each BHC in the peer group preferable when estimating beta? Should an alternative weighting process, such as by deposit or due-to balances, be used? What are the strengths and weaknesses of each weighting method?

4. Beta of 1.0

Historical betas use past returns of a firm and the market to estimate the firm's beta for the future. Historical betas, however, may not be a good predictor of the future risk for a firm because it may be facing different risks than it did in the past. Finance literature suggests that betas, as an empirical rule, move towards 1.0 over time. Assigning a beta of 1.0 for a firm assumes that the firm will achieve the same returns as the market over time, and therefore carries the same risk as the market in the long run.

To simplify the beta estimation process, the Board is considering assigning the Federal Reserve's priced services a beta of 1.0. When using a beta of 1.0, a peer group is no longer needed to estimate the target CAPM ROE.

An alternative way to incorporate the concept that all firm betas will revert to 1.0 is to weight the historical beta and the beta of 1.0 to determine the firm's adjusted beta. For example, financial literature suggests and financial firm practice support applying a two-thirds weight on the historical beta and a one-third weight on the beta of 1.0. The adjusted beta will reduce volatility and be a truer measure of risk over the long run while moving the beta estimate closer to 1.0.

The Board requests comment on incorporating the concept that all firm betas will be 1.0 over time in the priced-services beta calculation. Is a beta equal to 1.0 for Federal Reserve priced services a reasonable simplifying assumption when computing CAPM? Are important elements that should be factored into the CAPM equation eliminated with this assumption? If an adjusted beta should be considered, what is the best method for implementing it?

In addition, the Board requests comment on the overall CAPM methodology changes it is considering. Are the after-tax and pretax ROE results of the CAPM-only method reasonable? In what ways, if any, does this methodology oversimplify the calculation? In what ways, if any, is the methodology overly complex?

D. Effect of different PSAF methodologies

Table 6 shows the effect on the beta of changes to the CAPM factors being considered.

Table 6

Row	Peer group sample	Time period	Weighting method	Historical beta results	Adjusted beta results
1.	Current	10 years	Value	.94	.96
2.	Cross-matched	10 years	Value	.98	.99
3.	Cross-matched	5 years	Value	.82	.88
4.	Cross-matched	5 years	Equal	.57	.71

As shown in rows one and two, the reduction in the peer group size from fifty to twenty BHCs, which results when applying the filters described in the peer group section of the notice, causes the historical beta for the sample group to rise slightly. The rise in historical beta is attributable to the increased weight of the larger BHCs in the cross-matched peer group because the smaller BHCs in the current peer group of fifty dropped out. In general, the smaller BHCs have lower betas, which may result, in part, from a greater reliance on more-traditional and less-risky core banking activities. The weighting of the historical beta and the beta of 1.0 cause the adjusted beta to be closer to 1.0.

The change in historical beta between rows two and three reflects the change in the rolling beta estimation period from ten to five years. This change produces a notable drop in the historical beta. The reduction in the beta from .98 to .82 demonstrates that the cross-matched peer group has been less volatile than the market over the last five years than over the last ten years.

Lines three and four show that the historical beta for the cross-matched peer group declines significantly when moving from value-weighting to equal-weighting. The two largest BHCs based on market capitalization have substantially higher betas than the other BHCs in the peer group, with five-year averages of 1.5 and 1.2. With the exception of two midsize-to-small BHCs, the remaining BHCs in the peer group all have a five-year

average betas of less than 1.0.[24] The two largest BHCs account for more than 60 percent of the sample group's historical beta under value-weighting, while they make up just 24 percent of beta under equal-weighting.

Combining the peer group historical betas from table 6 above with the appropriate interest rate and market data, the pretax return on equity and the cost of equity for Reserve Bank priced services in 2005 are shown in table 7:

Table 7[25,26]

Row	BHC Peer group sample	Time period used for beta estimation	Beta weighting method	Short-term risk-free rate		Long-term risk-free rate	
				Pretax ROE	Cost of equity ($ millions)	Pretax ROE	Cost of equity ($ millions)
1.	Current	10 years	Value	12.5%	$ 101	14.8%	$ 120
2.	Cross-matched	10 years	Value	13.0%	105	15.3%	124
3.	Cross-matched	5 years	Value	11.1%	90	13.4%	108
4.	Cross-matched	5 years	Equal	8.3%	67	10.6%	86
5.	N/A	Beta of 1.0		13.2%	107	15.5%	125

In 2005, a 100 basis point change in the pretax ROE increases or decreases the imputed costs to priced services by about $8.1 million. This is approximately 1.1 percent of priced-services expenses.[27]

IV. Broader Issues in the Implementation of Target ROE

As noted earlier in this notice, the Board seeks to fully recover the costs of its priced-services operations, including the PSAF, over the long run. To limit unnecessary and potentially disruptive volatility in its pricing, the Board does not require priced services to offset previous years' overrecoveries or underrecoveries. Accordingly, a target ROE for priced services is calculated each year by the method described in this notice, and that target is factored directly into product pricing decisions for the upcoming budget year.

[24] The five-year average betas less than 1.0 range from .48-.85.
[25] A minor modification to calculate beta produces slightly different ROE results when comparing the current CAPM calculation, shown in the first row, with the current 2005 CAPM calculation shown in table 2.
[26] The estimated ROE is applied to the priced services 2005 book value equity balance of $808 million to derive the cost of equity shown in the table.
[27] System 2005 budgeted priced services expenses less shipping are $724.8 million.

The Board notes that among some companies the current practice is to establish a multiyear ROE target, to be achieved over a strategic planning horizon. Budget models may focus on specific project and business line targets or on maximizing profit from year to year. Strategic ROEs could take a longer-term view and consider changes in the marketplace and technology and how the firm would respond to them, along with planned capital investment. Companies may intentionally set prices in a way that would result in actual ROE performance deviating from the target year to year; however, they expect to achieve the target on average over the planning horizon.

The Board would consider adopting a longer-term view if a case could be made that it would significantly improve the efficiency of the payments systems. Implementing a less mechanical approach would require the Board to devise a transparent and replicable method to adjust the annual ROE targets built into the Reserve Bank priced-services' budget so as to achieve the long-term objective. The Board seeks comment on the following questions.

Do firms target a different ROE for near-term budgeting purposes than for multiyear, longer-term, strategic planning? What advantages or disadvantages are there to the Federal Reserve setting a PSAF, including the priced-services ROE, more or less frequently than annually? What, if any, are the implications if a longer-term approach to setting the ROE is adopted?

Under the MCA, the fees the Reserve Banks charge for priced services are to be set to fully recover the costs that a private-sector provider would incur in providing them over the long run. As the payments system evolves from paper-based transactions to electronic forms, the Board will be setting a target ROE for the Reserve Banks priced-services activities in the context of declining volumes for its check service line. The Board seeks comment on the following questions.

What are the advantages and disadvantages to the Board changing its current practice of setting the target ROE for priced services at an entity level and begin developing target ROEs for each service line? In what way should the Board adjust the target ROE to consider the decline in use of paper-based check products, given that the check service represents a majority of priced-services activities?

V. Looking Ahead

While the Board considers the changes to the current PSAF methodology discussed above, it recognizes that the changes under way in the payments industry and regulatory practices will, in all likelihood, lead to the consideration of more changes to the PSAF model in the longer term. Historically, the Board considered BHCs a proxy for the Reserve Bank priced-services peer group because correspondent banks are the Reserve Banks' primary competitors in providing check services, which comprises more than 80 percent of the cost of Reserve Bank priced-services activities. Competitors in the electronic payment services, however, have typically been market utilities. Market utilities, such as the Clearing House Interbank Payment System (CHIPS), which is the

primary competitor for Fedwire funds transfer services, and the Electronic Payments Network (EPN), which is the only private-sector automated clearinghouse (ACH) operator, are both member-owned clearinghouses. As paper check volume continues to decline and as the check service increasingly becomes electronic, market utilities may replace correspondent banks as the Reserve Banks' primary priced-services competitor.

Similarly, proposals developed by the Basel Committee on Banking Supervision (Basel II), once adopted, to improve capital regulations internationally, make regulatory capital more risk sensitive, include an explicit operational risk capital charge, and promote enhanced risk-management practices among large, internationally active banking organizations may affect the capital structure of the Reserve Banks' priced-services peer group and warrant consideration in developing the PSAF equity costs.

The Board would welcome any comments on the possible implications of these and other environmental changes for the appropriate approach to calculate the PSAF.

VI. 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."[28] 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 powers 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.

Because the PSAF includes costs that must be recovered through fees for priced services, changes made to the method may have an effect on fees. The Board is considering changes that may refine the PSAF peer group and ROE methodology to resemble that of other service providers as required by the MCA. Consequently, the fees adopted by the Reserve Banks should be based on the cost and profit targets that are comparable with those of other providers of services similar to Reserve Bank priced services. Accordingly, the Board believes that if it determines to adopt some or all of these changes, the 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.

[28] FRRS 9-1558

VII. Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. ch. 3506; 5 CFR 1320 Appendix A.1), the Board has reviewed the proposal under the authority delegated to the Board by the Office of Management and Budget. No collections of information pursuant to the Paperwork Reduction Act are contained in the proposal.

VIII. Summary of Comments Requested

A. Imputed ROE

The Board requests comment on alternative methods to calculate the target ROE.

1. Are there models, other than the three in use, that the Board should consider?
2. What is considered to be a reasonable target ROE for institutions that provide services similar to those provided by the Reserve Banks?

The Board requests comments on whether the CAPM methodology is appropriate to rely on to estimate a target ROE.

3. What important elements of the ROE calculation might be excluded if the Board adopts the CAPM-only method?
4. Are there considerations that do not support the use of CAPM to impute the Reserve Banks' target ROE?
5. Is the DCF model used to estimate a target ROE? What earnings estimates are the most useful?
6. Are recent published accounting earnings relevant when estimating a target ROE?
7. Is the volatility of the CAPM-only method acceptable?
8. Should CAPM-only be viewed as a method to develop an ROE that may be modified; if so, why and how would on modify the model?

B. CAPM Methodology

Risk-free investment horizon

The Board requests comment on the time horizon for estimating a target ROE.

1. Should the Federal Reserve's priced-services target ROE for the upcoming year be based on a short-term rate, which might reflect what the market expects its peers to deliver in the upcoming year, or should the target ROE be calculated using a long-term rate, which might better reflect the return that the market expects its peers to deliver, on average, over time?

2. Is it reasonable for the Board to incorporate a ten-year Treasury bond less a term premium to reflect an expected average short-term risk-free rate over a ten-year horizon?
3. What are other factors that could be used to incorporate a long-term time horizon?

Peer group

The Board requests comment on the modified approach to selecting a peer group, and in particular on the following questions.

4. What factors should be considered when determining the Federal Reserve's priced-services peer group?
5. Is selecting a peer group based on deposit balances, due-to balances, or a combination of both an appropriate peer group selection criterion?
6. Is there other criteria the Board should consider?
7. Do the Tier 1 capital-to-risk-weighted assets ratio and solvency ratings filters improve the selection method?

Beta estimation period

The Board requests comment on the beta estimation period.

8. Does a rolling five-year period or a rolling ten-year period better capture elements that are relevant to calculating a meaningful beta for estimating the Reserve Bank priced-services ROE?

Weighting of the peer group betas

The Board requests comment on what weighting method is appropriate to best capture the business risk of a peer group.

9. Is equal-weighting or value-weighting the returns of each BHC in the peer group preferable when estimating beta?
10. Should an alternative weighting process, such as by deposit or due-to balances, be used?
11. What are the strengths and weaknesses of each weighting method?

Beta of 1.0

The Board requests comment on incorporating the concept that all firm betas will be 1.0 over time in the priced-services beta calculation.

12. Is a beta equal to 1.0 for Federal Reserve priced services a reasonable simplifying assumption when computing CAPM?

13. Are important elements that should be factored into the CAPM equation eliminated with this assumption?
14. If an adjusted beta should be considered, what is the best method for implementing it?

In addition, the Board requests comment on the overall CAPM methodology changes it is considering.

15. Are the after-tax and pretax ROE results of the CAPM-only method reasonable?
16. In what ways, if any, does this methodology oversimplify the calculation?
17. In what ways, if any, is the methodology overly complex?

C. Broader issues in the implementation of the target ROE

The Board seeks comment on the following questions.

1. Do firms target a different ROE for near-term budgeting purposes than for multiyear, longer-term, strategic planning?
2. What advantages or disadvantages are there to the Federal Reserve setting a PSAF, including the priced-services ROE, more or less frequently than annually?
3. What, if any, are the implications if a longer-term approach to setting the ROE is adopted?
4. What are the advantages and disadvantages to the Board changing its current practice of setting the target ROE for priced services at an entity level and begin developing target ROEs for each service line?
5. In what way should the Board adjust the target ROE to consider the decline in use of paper-based check products, given that the check service represents a majority of priced-services activities?

D. Looking ahead

The Board requests comment on the possible implications that payment industry and regulatory changes may have on the approach to calculate PSAF.

By order of the Board of Governors of the Federal Reserve System, May 17, 2005.

Jennifer J. Johnson (signed)
Jennifer J. Johnson,
Secretary of the Board

Attachment I

2005 Current PSAF Peer Group
Top 50 BHCs by Deposit Balance

The bolded BHCs represent the cross-matched peer group. The bolded BHCs also met the Tier 1 capital to risk-weighted assets ratio, solvency rating, and publicly-traded filters. The bolded and asterisked BHCs are the due-to only peer group that met the filtering criteria.

ABN AMRO NORTH AMERICA HOLDING COMPANY
AMSOUTH BANCORPORATION
BANCWEST CORPORATION
BANK OF AMERICA CORPORATION
BANK OF NEW YORK COMPANY, INC.
***BANK ONE CORPORATION**
BANKMONT FINANCIAL CORPORATION
BANKNORTH GROUP, INC.
***BB&T CORPORATION**
CHARTER ONE FINANCIAL INC.
***CITIGROUP INC.**
CITIZENS FINANCIAL GROUP
CITY NATIONAL CORPORATION
***COMERICA INC.**
COMMERCE BANCORP, INC.
***COMPASS BANCSHARES, INC**.
***FIFTH THIRD BANCORP**
FIRST CITIZENS BANCSHARES, INC.
***FIRST HORIZON NATIONAL CORPORATION**
***FLEETBOSTON FINANCIAL CORPORATION**
GREENPOINT FINANCIAL CORPORATION
HIBERNIA CORPORATION
HSBC NORTH AMERICA HOLDINGS INC.
HUNTINGTON BANCSHARES INC.
***JPMORGAN CHASE & CO.**
***KEYCORP**
M&T BANK CORPORATION
***MARSHALL & ILSLEY CORPORATION**
MBNA CORPORATION
***MELLON FINANCIAL CORPORATION**
***NATIONAL CITY CORPORATION**
NATIONAL COMMERCE FINANCIAL CORPORATION
NEW YORK COMMUNITY BANCORP, INC.
NORTH FORK BANCORPORATION, INC.
NORTHERN TRUST CORPORATION
PNC FINANCIAL SERVICES GROUP, INC.
POPULAR, INC.
PROVIDENT FINANCIAL GROUP INC.
REGIONS FINANCIAL CORPORATION
SOUTHTRUST CORPORATION
STATE STREET CORPORATION
SUNTRUST BANKS, INC.
SYNOVUS FINANCIAL CORPORATION
TAUNUS CORPORATION
***U.S. BANCORP**
***UNION PLANTERS CORPORATION**
UNIONBANCAL CORPORATION
***WACHOVIA CORPORATION**
***WELLS FARGO & CO.**
ZIONS BANCORPORATION

Attachment II[29]

Cross-matched Peer Group Beta Estimates: Value- and Equal-Weighted Averages

	PSAF Year 2001		PSAF Year 2002		PSAF Year 2003		PSAF Year 2004		PSAF Year 2005	
	Beta	Weighted Beta	Beta	Weighted Beta	Beta	Weighted Beta	Beta	Weighted Beta	Beta	Weighted Beta
Bank One Corporation	1.44	0.070	1.13	0.070	1.05	0.070	0.91	0.070	0.73	0.051
BB&T Corporation	0.82	0.029	0.56	0.029	0.46	0.028	0.39	0.028	0.22	0.006
Citigroup Inc.	1.45	0.294	1.14	0.292	1.18	0.292	1.27	0.294	1.20	0.353
Comerica Inc.	1.07	0.012	0.83	0.012	0.6	0.012	0.53	0.013	0.43	0.005
Compass Bancshares Inc.	0.73	0.007	0.49	0.006	0.46	0.007	0.43	0.007	0.27	0.002
Fifth Third Bancorp	1.02	0.056	0.76	0.057	0.65	0.055	0.45	0.056	0.28	0.015
First Horizon National Corporation	1.18	0.008	0.86	0.007	0.68	0.007	0.59	0.007	0.28	0.002
FleetBoston Financial	1.19	0.042	1.05	0.042	0.94	0.043	1.12	0.042	1.17	0.049
JPMorgan Chase & Co.	1.37	0.079	1.34	0.078	1.37	0.079	1.62	0.079	1.62	0.128
Keycorp	0.98	0.017	0.59	0.017	0.42	0.017	0.31	0.005	0.11	0.002
Marshall & Ilsley Corporation	0.89	0.010	0.94	0.010	0.73	0.010	0.67	0.010	0.62	0.006
Mellon Financial Corporation	1.07	0.019	0.78	0.019	0.79	0.019	0.81	0.019	0.79	0.015
National City Corporation	0.94	0.028	0.62	0.027	0.53	0.028	0.41	0.011	0.33	0.009
Northern Trust Corporation	1.32	0.013	1.04	0.013	1.13	0.012	1.09	0.013	0.96	0.012
PNC Financial Services Group Inc.	0.92	0.020	0.58	0.019	0.57	0.019	0.60	0.020	0.47	0.009
Synovus Financial Corporation	1.07	0.009	0.77	0.009	0.71	0.010	0.66	0.009	0.58	0.005
U.S. Bancorp	0.88	0.067	0.69	0.068	0.55	0.067	0.58	0.039	0.49	0.033
Union Planters Corporation	1.00	0.009	0.74	0.009	0.57	0.009	0.51	0.010	0.35	0.003
Wachovia Corporation	0.95	0.081	0.84	0.081	0.75	0.081	0.67	0.054	0.58	0.047
Wells Fargo & Co.	0.94	0.131	0.66	0.130	0.54	0.131	0.42	0.131	0.21	0.027
Value-weighted average	1.18		0.93		0.88		0.89		0.78	
Equal-Weighted average	1.06		0.82		0.73		0.70		0.58	
Difference between Value-weighted and Equal-weighted	0.12		0.11		0.15		0.19		0.20	

Value-Weighted Average 2001-2005	0.932
Equal-Weighted Average 2001-2005	0.778
Average 2001-2005 difference	0.154

[29] Differences in calculation timing result in slightly different value- and equal-weighted betas than shown in Attachment III.

Attachment III[30]
Effect of various CAPM changes on 2005 PSAF

Peer Group	Weighting	Rolling period	Risk-free Rate		Beta	After-tax ROE	Pretax ROE
Current	Value	10 year	Short		0.94	8.8	12.5
Current	Value	5 year	Short		0.75	7.3	10.4
Current	Equal	10 year	Short		0.73	7.1	10.1
Current	Equal	5 year	Short		0.49	5.2	7.4
Current	Value	10 year	Long		0.94	10.4	14.8
Current	Value	5 year	Long		0.75	8.9	12.7
Current	Equal	10 year	Long		0.73	8.7	12.4
Current	Equal	5 year	Long		0.49	6.8	9.7
Cross-matched	Value	10 year	Short		0.98	9.1	13.0
Cross-matched	Value	5 year	Short		0.82	7.8	11.1
Cross-matched	Equal	10 year	Short		0.79	7.6	10.8
Cross-matched	Equal	5 year	Short		0.57	5.9	8.3
Cross-matched	Value	10 year	Long		0.98	10.7	15.3
Cross-matched	Value	5 year	Long		0.82	9.5	13.4
Cross-matched	Equal	10 year	Long		0.79	9.2	13.1
Cross-matched	Equal	5 year	Long		0.57	7.5	10.6

This attachment shows the effects of the considered changes on the 2005 CAPM ROE using a historical beta. The betas and the ROEs in the top section of the table are calculated using the current peer group. The betas and the ROEs in the bottom half of the table are calculated using the cross-matched peer group. The top four lines of each section show each of the considered changes to calculate beta with a short-term risk-free rate for each peer group, respectively. The bottom four lines of each section show each of the considered changes to calculate beta with a long-term risk-free rate, less a term premium, for each peer group, respectively.

[30] A minor modification to calculate beta produces slightly different ROE results when comparing the current CAPM calculation, shown in the first row, with the current 2005 CAPM calculation shown in table 2.