

Handbook: Thrift Activities
Subjects: Interest Rate Risk Management

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Responsibilities of the Board of Directors and Management with Regard to Interest Rate Risk

RESCINDED

Summary: Managing interest rate risk is an essential component in the safe and sound management of a thrift institution. This Bulletin provides guidance to the boards of directors and managements of insured institutions about their responsibilities in this area. It describes the internal policies, practices, and procedures that supervisory staff will expect institutions to utilize in order to comply with the existing regulations on interest rate risk.

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Under 12 CFR 563.17-6 and 571.3, an insured institution's board of directors is responsible for ensuring the prudent management of the institution's exposure to interest rate risk. In addition, § 563.17(a) requires safe and sound management practices, of which the management of interest rate risk is an essential component. Since the adoption of the current regulations governing interest rate risk, Federal Home Loan Bank System (FHLBS) staff has refined and enhanced the System's regulatory policies and procedures with respect to the interest rate risk exposure of insured institutions. This Bulletin reflects that evolution in regulatory philosophy and presents guidance on the responsibilities of boards of directors and management regarding interest rate risk.

FHLBS staff will expect insured institutions to adopt formal interest rate risk policy statements, containing the elements described in this Bulletin, by June 30, 1989.¹ Institutions will be expected to implement those policies and any attendant changes in management procedures

by December 31, 1989, or sooner where Supervisory Agents believe it to be warranted.

Definition of Interest Rate Risk

Interest rate risk (IRR) is defined as the sensitivity of a depository institution's earnings and net asset value to changes in interest rates. IRR can result from (a) timing differences in the repricing of an institution's assets, liabilities, and off-balance sheet contracts; (b) the exercise of embedded options, such as loan prepayments, interest rate caps, and deposit withdrawals; and (c) differences in the behavior of lending and funding rates, sometimes referred to as basis risk. (An example of the latter source of IRR would occur if floating rate assets and liabilities, with otherwise identical repricing characteristics, were based on market indexes that were imperfectly correlated.)

The earnings of most thrift institutions are exposed to IRR because their deposit liabilities reprice faster than their mortgage-related assets. As a result, if interest rates rise, the cost of funds increases more rapidly than the yield on assets, thereby reducing net interest income. From a market value perspective, changes in market interest rates have a greater effect on the present value of long-term, fixed-rate instruments than on that of short-term instruments. If an institution's assets are

of longer duration than its liabilities, the net present value of the institution's portfolio will decline when interest rates rise.

Objectives of IRR Management

The objective of IRR management is to maintain an institution's earnings and net worth within self-imposed parameters over a range of possible interest rate environments. Institutions will differ in their willingness to assume IRR, their management capability, and their ability to absorb potential losses. As with other aspects of financial management, a trade-off exists between risk and return; thus, the objective of IRR management need not be the complete elimination of an institution's exposure to changes in interest rates. The board of directors, however, has a fiduciary responsibility for ensuring that the level of IRR exposure incurred by the institution does not exceed prudent levels.

Policies and Procedures for Managing IRR at Insured Institutions

Managing IRR must be considered within the larger context of business planning (e.g., the introduction of new products, expansion, the pricing and structuring of products and services [including any associated customer options]). Although the following discussion focuses on the responsibilities of the board of direc-

¹ This Bulletin applies to insured institutions and any subsidiaries which, for purposes of the Thrift Financial Report, are reported on a consolidated basis.

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tors and management that relate specifically to managing IRR, the discussion is not meant to imply that IRR management can be conducted in isolation of other business considerations. Furthermore, although the board of directors should properly be concerned with the exposure of the consolidated organization and will undoubtedly want to assess the risk exposure of that entity, these guidelines pertain to the insured institution only.

Responsibilities of the Board of Directors

As noted above, § 563.17(a) requires insured institutions to have safe and sound management practices. The management of IRR is an essential aspect of managing a thrift institution. The board of directors must, therefore, ensure that the institution's policies and procedures for managing IRR are of a level of sophistication that is commensurate with the institution's activities and portfolio and that the institution's exposure is limited to a prudent level. More specifically, § 563.17-6 holds the board accountable for the IRR exposure of the institution and requires the board to establish a formal policy for the management of IRR and to review the results of management's implementation of that policy on at least a quarterly basis.

Board of directors' policy statement:

The board's policy statement should delegate responsibility for the management of IRR and should establish limits on the level of the institution's exposure. Specific authorizations and restrictions

should be provided regarding the institution's trading activities, its use of derivatives and synthetic instruments, and its hedging strategies. To facilitate the board's oversight of management in this area, the policy should specify the contents of management's reports to the board on this subject and state the frequency with which the directors will review IRR management (at least quarterly).

The FHLC has promulgated several policy statements addressing instruments or strategies that can have a significant effect on an institution's IRR management. These policy statements include:

- Risk Controlled Arbitrage (Memorandum SR-1, February 16, 1988; reprinted in United States League of Savings Institutions, *Federal Guide*, ¶ 11,700)
- Investment Consultants (Memorandum R-70, March 16, 1988);
- Mortgage Derivative Products and Mortgage Swaps (Thrift Bulletin TB 12, December 13, 1988).

Because of their connection to IRR, the requirements of these issuances should be of interest to boards of directors in framing their policies on IRR.

Exposure limits:

The most important element of the board of directors' policy statement is a set of explicit limits on the institution's exposure to IRR. Because the ability to control IRR requires a clear understanding of the amount

at risk, a board policy in which the IRR limit is expressed only in terms of repricing gaps will no longer be considered sufficient; the board must be aware of the sensitivity of the institution's earnings and net asset value to interest rate changes.

To ensure that the board has a clear understanding of the possible consequences of the IRR exposure being authorized, the institution's IRR policy should define the maximum potential reduction in earnings and net worth that the board is prepared to accept as a result of possible changes in market interest rates. Management should structure the institution's balance sheet and off-balance sheet items so that projected results (under reasonable, documented assumptions) comply with the board's limits.

Specifically, the policy should establish limits on the sensitivity of the institution's net interest income² and market value of portfolio equity³ to changes in interest rates. Thus, the policy should specify the maximum percentage change the board of directors is prepared to accept in those two measures as a result of a parallel shift in the term structure of interest rates prevailing at the date of the analysis. These maximum changes should be specified for instantaneous and sustained changes in interest rates of ± 100 , ± 200 , ± 300 , and ± 400 basis points and should be measured relative to the levels of net interest income and portfolio equity under an assumption of no change in interest rates.⁴

Example 1 illustrates a possible set

² The interest rate sensitivity of net interest income should be evaluated over at least the next four quarters.

³ The market value of portfolio equity (hereafter also referred to as "portfolio equity") is defined as the net present value of an institution's existing assets, liabilities, and off-balance sheet instruments. The appendix to this bulletin discusses the composition and calculation of this measure in more detail.

⁴ These particular interest rate scenarios provide a convenient basis for analyzing risk exposure; they are not meant to be interest rate forecasts. It has become standard practice in financial analysis to examine the impact of potential rate changes of these magnitudes on the value of financial instruments and/or portfolios.

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Example 1

XYZ Savings & Loan Association Interest Rate Risk Exposure Limits		
[1]	[2]	[3]
Change in Interest Rates (in basis points)	Maximum Permissible Change in: Net Interest Income (Next Four Quarters)	Market Value of Portfolio Equity
+400	-125%	-90%
+300	-75	-50
+200	-50	-25
+100	-20	-10
0	0	0
-100	-20	0
-200	-50	25
-300	-75	50
-400	-125	90

should set these percentages. Note, for instance, that in column [3] of the example, XYZ's board has established limits that would enable the market value of the institution's portfolio to withstand an instantaneous and sustained interest rate change of 400 basis points in either direction.⁵

The technical details of implementing such a policy — e.g., choosing a discount rate for computing changes in market value, ensuring reasonable assumptions about the behavior of customer options, and validating the overall computations — may be left to management. All assumptions should be documented and the board should, as part of its oversight function, periodically assure itself that they are reasonable.

of exposure limits that a board of directors might establish. In the example, the directors of XYZ Savings and Loan have specified that the institution's exposure be limited so that, for each interest rate change listed in column [1] of the table, the institution's net interest income would be reduced by no more than the percentage shown in column [2], and its market value of portfolio equity would be reduced by no more than the percentage in column [3]. For example, if the market value of XYZ's portfolio equity were \$1,000 under current market interest rates, management would have to limit the institution's IRR exposure so that an immediate increase in interest rates of 400 basis points (column [1], line 1) would reduce port-

folio equity by no more than 90 percent (column [3], line 1), to a level of \$100. Similarly, if XYZ's net interest income were projected to be \$400 under a constant rate environment, then management would have to limit the institution's exposure so that a 400 basis point increase in interest rates (again, column [1], line 1) would reduce net interest income by no more than 125 percent (column [2], line 1), to no worse than -\$100 (i.e., $\$400 \times [1 + (-125/100)] = -\100).

The maximum permissible reduction in net interest income and portfolio equity are for the board of directors to determine. The lower the board's desired level of interest rate sensitivity, the closer to zero it

Finally, note that the example specifies the maximum permissible percentage reductions under both positive and negative changes in interest rates. Although the net interest income and portfolio equity of most thrift institutions would increase in a declining interest rate environment, it is clearly possible for the opposite situation to exist (i.e., for an institution to be "asset sensitive"). There is, of course, no need for the board of directors to set the exposure limits symmetrically around a zero percent change in rates, as in Example 1. It should establish the exposure limits in whatever configuration best reflects the board's views on what constitutes a prudent level of exposure, based upon the institution's financial condition and its expertise in managing IRR.

⁵ As an institution's projected net interest income (under constant interest rates) or portfolio equity approach zero, the board of directors will need to be aware that its limits on IRR exposure, expressed as maximum allowable percentage changes in these two measures, will effectively become more stringent and may require adjustment.

Institutions with negative projected net interest income (under constant rates) should calculate their percentage changes by dropping the negative sign of the denominator (i.e., by using the absolute value of the denominator). For example, assume an institution's net interest income is projected to be -\$100 for the next four quarters under a constant interest rate environment. If the board of directors were unwilling to see net interest income fall below -\$150 under a particular interest rate scenario, it would specify the exposure limit for that scenario as -50%. That is,

$$\frac{[-\$150 - (-\$100)] \times 100}{\$100} = -50\%$$

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Periodic review of IRR management:

Periodic reports by management to the board of directors should demonstrate compliance with exposure limits. Reports by management should, therefore, include an analysis of how net interest income and the market value of portfolio equity would be affected by the hypothetical interest rate changes specified in the board's policy.

Example 2 illustrates the type of interest rate sensitivity analysis that management should prepare in order to demonstrate compliance with its board's exposure limits. In columns [3] and [5] of the example, XYZ's management is reporting that

neither net interest income nor portfolio equity would be reduced by more than the percentages permitted by the board of directors, shown in columns [2] and [4], under any of the prescribed interest rate environments. Finally, the levels of net interest income and portfolio equity used as denominators in calculating reported as memo items.

Clearly, measurements of the sensitivity of the institution's net interest income and portfolio equity will be necessary for management to demonstrate compliance with the board of directors' limits on exposure (as in columns [3] and [5] of Example 2). The FHLBS will calculate estimates of these sensitivity measures using data reported on Form 104 of the Thrift Financial Report and will provide those estimates to each insured institution.

All thrift institutions are strongly encouraged to develop the capability of performing those sensitivity measures for themselves, both to improve the quality of information being supplied to their boards of directors and to improve management's ability to manage the institution's exposure to interest rate risk. Nonetheless, because these measurement techniques are not presently in widespread use in the thrift industry, the managements of most institutions may opt to rely on the FHLBS's interest rate sensitivity estimates to demonstrate compliance with their directors' exposure limits.

Institutions with assets in excess of \$500 million or investing in high risk mortgage derivative products will not be permitted to rely solely on the FHLBS's exposure estimates. Such institutions should have the management information systems necessary to perform the required interest rate sensitivity measurements. They will, therefore, be expected to be able to generate reliable net interest income and market value sensitivity measures by December 31, 1989.⁶ In addition, Supervisory Agents have the discretion to require other institutions to develop such a measurement capability. Typically, this will be required of institutions with substantial volumes of options, futures, or interest rate swaps, or that otherwise have a complex asset/liability profile.

Because any system of IRR management will rely on certain assumptions, management should demonstrate to the board, and document, that the assumptions underlying its interest rate sensitivity analysis are reasonable. For example, management would need to explain how prepayments would be expected to behave under the various interest rate changes and how they would

Example 2

Current Exposure of XYZ Savings & Loan Association to Hypothetical Changes in Interest Rates

[1] Change in Interest Rates (in basis points)	[2] Net Interest Income Board Limit		[4] MV of Portfolio Equity Board Limit	
	[3] Projected Change	[5] Projected Change	[3] Projected Change	[5] Projected Change
+400	-125%	-105%	-90%	-85%
+300	-75	-70	-50	-40
+200	-50	-30	-25	-15
+100	-20	-10	-10	-5
0	0	0	0	0
-100	-20	15	-10	10
-200	-50	35	-25	15
-300	-75	40	-50	15
-400	-125	45	-90	20

Memo:

Net interest income projected under constant interest rates: \$ 400
Market value of portfolio equity under current interest rates: \$1,000

⁶ Supervisory Agents may extend this deadline for institutions that are making good faith efforts to develop the necessary data processing systems and technical abilities.

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affect the sensitivity measures.⁷ If more elaborate sensitivity analysis is used by the institution than is prescribed by these guidelines, the assumptions being made in that analysis should be discussed with the board and management.

The board of directors should also consider requiring management to reconcile actual operating results and market values with those projected in the prior period's interest rate sensitivity analysis. Analyzing the sources of variance between actual and forecast will be beneficial not only in improving the institution's financial forecasting ability, but will add to the board's understanding of the major factors driving the institution's exposure to interest rates and the variability of those factors. This exercise will also highlight, for the board, any de facto changes in the institution's business plan.

Responsibilities of Management

Management is responsible for structuring the institution's balance sheet and off-balance sheet transactions in a manner consistent with the board's IRR policy. Management will accomplish this objective through three activities:

- Developing and implementing an IRR management strategy;
- Establishing and maintaining a system of limits and controls; and
- Establishing and utilizing an IRR measurement system.

IRR management strategy:

The board and management are responsible for ensuring the safety and soundness of the institution's

IRR management strategy and its implementation. In deciding upon an IRR strategy, the board and management should take into account the level of expertise needed to implement the strategy and whether such expertise is currently available in the institution. A prudent IRR management strategy should be within the scope of existing management expertise. If an institution requires outside assistance to formulate and implement such a strategy, it should observe the provisions of R-Memorandum Number 74 (Investment Consultant Guidelines on Use of Such Consultants and Monitoring and Controlling Their Activities). That is, management must understand fully the reasons for adopting a given strategy and its possible effects on the short-term and long-term financial health of the institution. Responsibility for the decision-making cannot be ceded to a consultant.

There may be circumstances in which steps taken to manage IRR conflict with or limit an institution's ability to attain other business goals. In order to ensure that such conflicts are minimized, management's IRR strategy should be developed in conjunction with the creation of a comprehensive business plan for the institution. Further, an institution's strategy to remedy an excessive IRR exposure should not rely on speculative or problematic plans that might result in excessive credit or liquidity risk.

Limits and controls:

Management must control the institution's operating activities so that the aggregate IRR exposure may be coordinated and brought into compliance with the board's policy. The diverse investment, lending, funding, and capital market activities of

the institution must be conducted within a system of reporting and controls that will permit management to monitor and manage the overall IRR exposure of the institution.

Furthermore, certain units within the typical institution have the ability to affect the institution's IRR exposure quite rapidly. Typically these are units involved in capital markets activities. Because of the significant potential impact such activities can have on the institution's exposure and the speed with which they can be consummated, management should establish exposure limits on such units and their personnel. A timely means of monitoring compliance with those exposure limits is essential. The longer the lag between the possible establishment of an undesired or unauthorized exposure and management's ability to reverse that exposure, the greater is the possibility of

IRR measurement:

An essential element of managing IRR is the ability to measure interest rate exposure accurately. Management has the responsibility to use a method of measurement that accurately assesses its exposure to IRR. The state of knowledge about asset/liability management has advanced rapidly in recent years and the development of measurement techniques, such as duration and simulation models, has greatly enhanced the ability of depository institutions to measure and manage their IRR exposures.

As previously discussed, most institutions will be permitted to rely on the exposure estimates calculated by the FHLBS. These estimates will generally be less accurate than measures generated using detailed internal data and based upon an

⁷ Managements using the FHLBS estimate measures of interest rate sensitivity should conduct a similar discussion with their directors in order to apprise them of the reliability of those estimates.

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institution's own informed assumptions. Moreover, because of reporting lags, the FHLB's estimates will not be as current as an institution's internally generated exposure measurements would be. It is, therefore, strongly recommended that all thrift institutions develop the capability to calculate their own measures of exposure to interest rate risk.

The measures and procedures presented in this Bulletin are not intended to preclude institutions from engaging in other techniques of measuring and managing IRR. On the contrary, the interest rate sensitivity measures prescribed above should be considered the minimum level of information needed by the board of directors in order to oversee the management of IRR effectively.

Regulatory Concerns

There are four circumstances that would cause regulatory concern: (a) a nonexistent or incomplete IRR policy, (b) unacceptably high limits on IRR exposure, (c) noncompliance with the board of directors' IRR policy, and (d) weaknesses in management reporting systems or internal controls.

Nonexistent IRR Policy

The first cause for regulatory concern is the absence of a written IRR policy or a policy that lacks one or

more of the elements discussed in the section, "Board of directors' policy statement". As noted above, existing regulation requires the board of directors to adopt a policy for the management of IRR. If such a policy is nonexistent or fails to address relevant policy issues, the institution may be in violation of § 563.17-6, and the situation will be treated in the same manner as other possible violations of regulation.

Unacceptable Limits on IRR Exposure

The board of directors has a fiduciary responsibility to operate the institution in a safe and sound manner and, therefore, establish and ensure compliance with prudent limits on IRR exposure. Generally, such limits should not permit an exposure that has the potential to deplete net worth to a level below the regulatory minimum or to eliminate the book value of the institution's portfolio equity under plausible changes in interest rates.⁸

If regulatory staff determines that excessive exposures are permitted by the board's IRR policy, or if the institution fails to take appropriate action to reduce such an existing exposure, the board of directors will be apprised of these findings and be given adequate opportunity to respond to the assessment of the regulatory staff. If, following consideration of the institution's response,

the Principal Supervisory Agent believes that the institution's IRR exposure is inappropriate, and if the institution fails to take remedial steps, enforcement action will be taken.

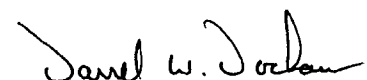
Noncompliance with Board of Directors' IRR Policy

If an institution's IRR exposure is found to exceed the limits established by the board of directors, corrective measures (e.g., improved reporting systems, intensified board oversight) should be taken in order to prevent a recurrence of the situation. If the excessive exposure was the result of intentional decisions by management to exceed the board's limits, appropriate disciplinary action should be taken by the board of directors.

Weaknesses in Reporting or Internal Controls

The final source of possible concern is an institution with weaknesses in its IRR management practices and procedures (e.g., poor measurement systems, weak internal controls). While even an institution's exposure may not be excessive at present, deficiencies in IRR management allow for the possibility that excessive exposures may develop in the future. The identified weaknesses will be discussed with the institution's board and management, and an acceptable plan to correct them will be required.

⁸ Some troubled institutions have limited scope to reduce their IRR exposure. Supervisory Agents, therefore, have discretion to modify the guidelines in this bulletin for institutions operating under Consent Agreements or Special Agreements. In determining whether such an institution's exposure is excessive from a regulatory perspective, Supervisory Agents should review the available alternatives for reducing the institution's exposure and the impact those alternatives would have on the institution's financial condition. The Supervisory Agent's decision should be communicated to the institution's board and documented. Such an institution should, nonetheless, otherwise comply with the guidelines in this bulletin. In particular, its board of directors will be expected to maintain exposure limits (albeit possibly high ones) and its management will be expected to measure and report the institution's current interest rate exposure.



— Darrel W. Dochow, Executive Director

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Calculating the Market Value of Portfolio Equity

The market value of portfolio equity (“portfolio equity”) is a key component of a depository institution’s economic value. As is discussed below, portfolio equity is defined as the net present value of assets, liabilities, and off-balance sheet contracts.

The interest rate sensitivity of portfolio equity is an important measure of IRR. Since portfolio equity includes the present value of the future cash flows resulting from all currently booked instruments, it provides a leading indicator of an institution’s future stream of net interest income. This allows management to take a longer-term perspective on IRR management without having to examine the effects of a particular portfolio structure on net interest income in each individual future period; the change in portfolio equity thereby provides a compact measure of those future effects.

The interest rate sensitivity of portfolio equity is also highly relevant from a regulatory perspective, since it measures the potential effect of interest rate changes on the major component of an institution’s economic value. Economic value is an important consideration for all thrifts, but it is an especially important consideration with regard to marginally solvent institutions, since changes in portfolio equity have a direct bearing on the potential cost of disposing of such institutions, should they fail.

Calculating the Market Value of Portfolio Equity

The general formula for calculating the market value of portfolio equity is as follows:

Market value of portfolio equity =
Present value of cash flows from existing assets
minus the present value of cash flows from existing liabilities
plus the present value of cash inflows from existing off-balance sheet contracts
minus the present value of cash outflows from existing off-balance sheet contracts.

Computing changes in the market value of portfolio equity will clearly require an institution to make a number of assumptions. Management should ensure that all assumptions are reasonable and are documented. The following discussion provides some guidance in calculating portfolio equity and in making the necessary assumptions.

Cash flows to be included in the market value calculation:

- cash and deposits with other financial institutions;

- expected receipts (principal and interest) associated with existing loans, leases, participations, and securities (regardless of whether held for investment or trading purposes);
- expected payments of principal and interest associated with existing deposits and borrowings (including subordinated debt);
- expected payments of dividends on all preferred stock;
- expected cash inflows and outflows associated with existing futures, swaps, options, and firm and optional commitments to originate, purchase, and sell financial instruments; and
- any other well-defined, contractual cash flows resulting from existing financial contracts, such as loan servicing agreements.

Adjustments to cash flows due to customer options:

Future cash flows on the items listed above may be greatly affected by the existence of customer options, such as loan prepayments, caps, or deposit withdrawals. The institution will need to make assumptions about how customer options will be exercised under different interest rates and adjust the scheduled cash flows accordingly.

Assets to be included at book value:

It is difficult to calculate the present value of many of the assets and liabilities of thrift institutions because of uncertainty about the timing and the amount of their cash flows. To avoid unduly complicating the IRR measurement process at this early stage of implementation, it may reasonably be assumed that the present values of some items will not be affected by changes in the level of interest rates. This assumption is most easily incorporated into the analysis by assuming that the present value of such items remains at book value (net of any associated valuation allowance), regardless of the interest rate scenario. In calculating the percentage change in the market value of portfolio equity, therefore, the present value of the following assets should generally be assumed to be equal to their book value (net of any associated valuation allowance), regardless of the level of interest rates:

- fixed assets;
- repossessed assets;

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- real estate held for development, investment, or resale; and
- assets of which any portion is classified as doubtful or loss.

Cash flows to be excluded from the market value calculation:

The following types of cash flows should generally be excluded from the calculation of portfolio equity:

- anticipated loan fees or service charges, other than those that may reasonably be expected in connection with existing assets or liabilities or in connection with existing commitments;
- anticipated non-interest expenses (e.g., salaries, occupancy expenses, income taxes); and
- future dividends (except preferred dividends) to be paid to or received from individuals or corporations (including service corporations or other unconsolidated affiliates).

In addition, certain other balance sheet entries that are appropriate under Regulatory Accounting Principles should be excluded from the calculation of the market value of portfolio equity. These are accounting entries

intended to delay the recognition of income or expense cash flows that actually occurred in the past, such as:

- deferred loan fees, unamortized premiums, or unaccreted discounts;
- fees paid on options;
- deferred gains or losses on futures or options or deferred gains or losses on the sale of assets; and
- goodwill.

Method of discounting:

A number of alternative discount rate configurations are possible, ranging from discounting all cash flows by a single “average” discount rate, to configurations in which different discount rates are used for each cash flow. The costs and benefits of one method versus another will differ for each institution. The responsibility for choosing a particular discounting method resides with the institution. Like other assumptions necessary to the analysis, the details of the method that is chosen, and the rationale for choosing it, should be documented. Finally, to assure an unbiased analysis, the method of discounting should be applied by the institution in a consistent manner over time. Any changes, and the reasons for them, should be well documented.