

(between 70 and 100 percent of the computed minimum RBC amount), the regulator may place the insurer under regulatory control but is not required to do so.

- **Mandatory Control Level**—If an insurer’s capitalization level falls below 70 percent of the Authorized Control Level (the computed minimum RBC amount), the insurance regulator is required to place the insurer under regulatory control.

Insurers should maintain capital at 200 percent of the Authorized Control Level or more to avoid any regulatory action.

## **ECONOMIC CAPITAL**

Economic capital is becoming an accepted, if not required, global standard for capital requirements of insurers.

Economic capital, a form of regulatory capital, is an estimate of the amount of capital a firm needs to remain solvent at a given risk tolerance level. It differs from other types of regulatory capital because rather than being based on a formula, it is based on the fair (market) values of the firm’s assets and liabilities as well as their variability.

Economic capital is developed by modeling the potential variability in market value of a firm’s assets and liabilities, taking into consideration all of the firm’s risks (market, credit, liquidity, underwriting, operational). These risks are considered together to estimate at the firm level the probabilities of various amounts by which the market value of the firm’s liabilities may exceed the market value of its assets over a one-year period. This probability measure is based on the value at risk (VaR) concept, which uses variability in market values of an asset to estimate the probability of a loss in market value exceeding a threshold level over a given time period. For example, the firm overall may be expected to incur a \$50 million or greater loss of “capital” (based on the market value of its assets minus the market value of its liabilities) 0.5 percent of the time (1 out of every 200 years). Looked at another way, the firm may be expected to incur a capital loss of no more than \$50 million 99.5 percent of the time (199 out of every 200 years.) Using this standard, the firm’s economic capital level should be set at \$50 million.

The concept of economic capital underlies new European regulatory standards for insurers (“Solvency II”), which will affect not only European-based insurers but U.S. insurers with European subsidiaries or parents.

## **Fair Value Accounting**

The determination of an organization’s economic capital starts with the fair value accounting of its assets and liabilities. Fair value is a market-based measurement based on the price the asset owner would receive by selling the



asset, or that a liability holder would pay to transfer the liability. The latter is sometimes called an exit price.

As defined in Statement of Financial Accounting Standards No. 157 (SFAS 157), “Fair Value Measurements,” the fair value of an asset or liability is the price a knowledgeable and independent entity would pay in an active market, excluding any transaction costs. For example, the fair value of an actively traded bond is its trading price at the time of valuation.

The fair value market price of an asset or liability incorporates several factors. The most important are the future cash flows and the risk attached to those cash flows. For example, the present value of a bond issued by an organization in financial difficulty would reflect the possibility of default on interest or principle payments. The valuation of assets or liabilities that are not traded on active markets is based on a hypothetical transaction on the valuation date. The valuation can be based on an estimate of the value of similar items or the present value of expected future cash flows.

Fair value accounting differs from generally accepted accounting principles (GAAP) or statutory accounting principles (SAP) used by insurers, both of which at times use nonmarket values. For example, under GAAP, assets such as machinery and buildings are valued at depreciated cost. Under GAAP and SAP, bonds that will be held to maturity may be valued at amortized cost. SAP excludes furniture and equipment from its calculation of assets. In some instances, use of a particular accounting practice can result in misleading indications of an organization’s financial status. For example, basing the value of real estate on cost rather than on a market value that is lower can lead to financial difficulty for a financial organization.

Under GAAP, an organization’s net worth (assets less liabilities) is often called equity. Under SAP, an insurer’s net worth is called policyholders’ surplus. Fair value accounting, which uses actual or estimated market values, calls net worth **market value surplus (MVS)**.

## Fair Value of Insurers

The calculation of an insurer’s fair value is complicated because no readily available market exists for trading insurers’ largest liabilities: loss reserves (including loss adjustment expenses) and unearned premium reserves. These liabilities are generally carried on an insurer’s balance sheet at the undiscounted estimate of future payments or earned amounts. However, these reserve estimates are uncertain, particularly for future loss payments. Therefore, it is unlikely that an insurer would be able to transfer these reserves to a reinsurer or other party at their present value. The assuming entity would require additional payment for the potential that the reserves prove to be inadequate. This additional payment is called a risk premium, risk margin, or market value margin. Therefore, to calculate the fair value of an insurer’s reserves, estimated future amounts are discounted to present value and a market value margin is added.

### Market value surplus

The fair value of assets minus the fair value of liabilities.



An insurer's MVS can therefore be calculated as:

$$\begin{aligned}\text{Market value surplus (MVS) of insurer} &= \text{Fair value of assets} - \text{Fair value of liabilities} \\ &= \text{Fair value of assets} - (\text{Present value of} \\ &\quad \text{liabilities} + \text{Market value margin})\end{aligned}$$

MVS can be considered a risk-adjusted form of policyholders' surplus. MVS is already adjusted for risk because fair value takes into account the risk inherent in the cash flows arising from assets and liabilities and because a market value margin is added to the present value of the liabilities.

## Economic Capital for Insurers

An insurer's economic capital is the amount of capital required to maintain solvency (that is, an MVS greater than zero) at a given risk tolerance level.

The underlying paradigm of economic capital is similar to an insurer's risk-based capital (RBC) calculation. Both attempt to quantify the various risks faced by an insurer, such as these:

- Market risk (for example, changes in bond or stock prices)
- Credit risk (for example, defaults by those owing money)
- Liquidity risk (losses due to improper matching of asset and liability cash flows)
- Insurance risk (potential for adverse loss experience or catastrophe losses)
- Operational risk (for example, failed internal processes due to data system problems)

A major difference between the calculation of RBC and economic capital is that RBC uses factors to calculate a risk margin for the underlying risks. In contrast, economic capital is calculated using probability models of the various factors affecting results.

Probability models estimate the likelihood of potential outcomes by allowing for variation over time of inputs such as loss ratios, interest rates, and the effect of regulation changes. The variations are usually based on historical experience. For example, a model using interest rates as an input would include the probabilities of a 1 percent increase in a year, a 2 percent decrease, and so on. Probability models are used to estimate the effect of various stresses on the market value of an organization's assets, liabilities, and MVS. Insurers are particularly concerned about the variability of insured losses, both from current policies and in the loss reserves for prior claims. Numerous models are needed to simulate the potential risks to an organization across all aspects of its operation.

The results of the various models are combined, taking into account any overlapping effects or correlation between risks. The output is a distribution of possible fair value profits and losses (gains and losses in market value surplus),

